



Children's Surgery
Verification™

QUALITY IMPROVEMENT
PROGRAM

A QUALITY PROGRAM
of the AMERICAN COLLEGE
OF SURGEONS

Optimal Resources for Children's Surgical Care

2021 Standards | Effective July 2022

DED IN 1913
S PER ARTEM
DEMQUE
RODESSE

facs.org/childrensverification



AMERICAN COLLEGE OF SURGEONS

Inspiring Quality:
Highest Standards, Better Outcomes

100+ years



AMERICAN COLLEGE OF SURGEONS

*Inspiring Quality:
Highest Standards, Better Outcomes*

100+years



**Children's Surgery
Verification™**

QUALITY IMPROVEMENT
PROGRAM

AMERICAN COLLEGE OF SURGEONS
**Optimal Resources for
Children's Surgical Care**

2021 Standards

Table of Contents

Executive Summary	ii
Acknowledgments	iii
About the Children’s Surgery Verification Quality Improvement Program	iii
1 Institutional Administrative Commitment	1
1.1 Institutional Commitment	3
1.2 Administrative Structure	4
2 Program Scope and Governance	7
2.1 Hospital Governance	9
2.2 Surgical Volume Requirement	10
2.3 Surgical Infrastructure	11
2.4 Operating Room (OR) Committee	12
2.5 Ambulatory Surgery Patients and Ambulatory Surgical Center	13
2.6 State and/or Regional System Planning	15
2.7 Referrals within Region	16
2.8 Transfer Agreements and Protocols/Guidelines	17
2.9 Medical Director of Children’s Surgery (MDCS) or Program Director (PD)	18
2.10 Medical Director of Children’s Anesthesiology (MDCA)	20
2.11 Children’s Surgery Program Manager (CSPM)	21
2.12 ACS NSQIP Pediatric Surgeon Champion (SC)	22
2.13 ACS NSQIP Pediatric Surgical Clinical Reviewer (SCR) and Other Data Collection Personnel	23
3 Facilities and Equipment Resources	25
3.1 Neonatal Intensive Care Unit (NICU)	27
3.2 Pediatric Intensive Care Unit (PICU)	28
3.3 Emergency Department Facilities	29
3.4 Preoperative Facilities	30
3.5 Operating Room Facilities	31
3.6 Pediatric Post-Anesthesia Care Unit (PACU)	32
3.7 Imaging Facilities	33
3.8 Blood Bank and Laboratory Services	34
3.9 Extracorporeal Membrane Oxygenation (ECMO)	35
3.10 Telemedicine and Teleconferencing	36

4 Personnel and Services Resources	39	5.10 Outpatient Coordination of Complex Care	95
4.1 Surgeons	41	5.11 Specialized Nursing Protocols	96
4.2 Anesthesia Services	43	5.12 Palliative Care	97
4.3 Medical Specialists	45	5.13 Enhanced Recovery After Surgery (ERAS) Protocols	98
4.4 General Pediatricians and Hospitalists	47		
4.5 NICU Personnel	48	6 Data Surveillance and Systems	101
4.6 PICU Personnel	50	6.1 ACS NSQIP Pediatric	103
4.7 Imaging Services—Diagnostic Imaging	53	6.2 Children’s Surgery Safety Report (Appendix I)	105
4.8 Imaging Services—Interventional Radiology	55	6.3 Data Management and Electronic Resources	106
4.9 Emergency Department Personnel	56		
4.10 Pediatric Advanced Practice Providers	58	7 Quality Improvement	109
4.11 Credentialing	59	7.1 Hospital Integration	111
4.12 Call Coverage	60	7.2 Surgery PIPS Committee Structure	112
4.13 Continuing Medical Education	61	7.3 PIPS Committee Responsibility	114
4.14 Rapid Response Teams	62	7.4 Mortality and Serious Safety Event Review	115
4.15 Preoperative Personnel	63	7.5 PIPS and Data Review	116
4.16 Operating Room Personnel	64	7.6 Quality Improvement Projects	118
4.17 Post-Anesthesia Care Unit (PACU) Services	65	7.7 Transport and Transfer Review	119
4.18 Pediatric Nursing	66		
4.19 Nutrition Services	67	8 Education: Professional and Community Outreach	121
4.20 Pharmacy Services	69	8.1 Children’s Surgery Education, Outreach, and Scholarly Activities	123
4.21 Respiratory Therapy Services	71	8.2 Children’s Surgery Education for Nurses and Other Allied Health Professionals	125
4.22 Child Life Services	72		
4.23 Child Maltreatment Services	73	9 Research	127
4.24 Laboratory Services	75	<i>Fulfilled by 8.1 Children’s Surgery Education, Outreach, and Scholarly Activities</i>	
4.25 Renal Replacement Services	76		
4.26 Transport Services	77		
		Appendices	130
5 Patient Care: Expectations and Protocols	81	Appendix I Children’s Safety Report	130
5.1 Operating Room Protocols	83	Appendix II Alternative Pathway	132
5.2 Radiology Protocols	84	Appendix III Surgeon Equivalency	134
5.3 Massive Transfusion Protocol (MTP)	85	Appendix IV Pediatric Neurosurgery Call Coverage	135
5.4 Opioid Stewardship	86	Appendix V Stakeholders Meeting	136
5.5 Perioperative Antibiotic Stewardship	88	Appendix VI Related Standards	137
5.6 Tumor Board	89	Appendix VII Criteria Quick Reference Guide	138
5.7 Perioperative Anesthesia Risk Assessment Program	90		
5.8 Acute Pain Management	93		
5.9 Clinical Protocols and Practice Guidelines	94		

Executive Summary

Important Information about the Children's Surgery Verification Quality Improvement Program

The American College of Surgeons (ACS) has long been the leader of activities directed toward the improvement of surgical care. The Children's Surgery Verification (CSV) Quality Improvement Program, commonly referred to as the CSV Program, specifically addresses the surgical care of infants and children. The program is based upon the standards detailed here that define the resources believed necessary to achieve optimal patient outcomes for children's surgical care regardless of location in a community hospital, stand-alone children's hospital, specialty hospital, or children's hospital within a hospital. The intent of the program is to match children's specific providers and resources to the individual needs of every child needing surgical care. The institutional verification program is administered by the ACS. This document, *Optimal Resources for Children's Surgical Care 2021 Standards*, is to be used as a guide for the development and verification of centers throughout the U.S. It is the basis upon which centers will be evaluated by ACS-approved site reviewers.

These standards are intended solely as qualification criteria for Children's Surgery Verification. They do not constitute a standard of care and are not intended to replace the medical judgment of the physician or health care professional in individual circumstances. "Standard" as used in this manual is defined as a "qualification for verification," not standard of care. For a program to be found compliant with the CSV Standards, the program must be able to demonstrate compliance with the entire standard as outlined in the Definition and Requirements and Documentation sections for each standard.

The Documentation section for each standard is intended to provide summary guidance on how compliance must be demonstrated. The Documentation section is not intended to stand alone or supersede the Definition and Requirements. In addition to verifying compliance with the standards as written in this manual, CSV may consider other factors not stated herein when reviewing a program for verification and reserves the right to withhold verification on this basis.

Acknowledgments

We would like to thank the representatives of the members of the CSV Standards Revision Project workgroups who were vital to the completion of this standards manual. We would like to thank our stakeholders for their participation in finalizing revisions to the standards for this version of the manual (See Appendix V).

Volunteer Contributors

Douglas Barnhart, MD, MSPH, FACS, CSV Verification Committee Co-Chair

Patrick Cartwright, MD, CSV Verification Committee

Craig Derkay, MD, FACS, CSV Verification Committee

Jayant Deshpande, MD, CSV Verification Committee

Mary Fallat, MD, FACS, CSV Verification Committee Co-Chair

Keith Georgeson, MD, FACS, CSV Verification Committee

Lynn Haas, MSN, RN, CSV Verification Committee

Ronald Hirschl, MD, FACS, CSV Verification Committee

Constance Houck, MD, CSV Verification Committee

David Mooney, MD, FACS, CSV Verification Committee

Larry Moss, MD, FACS, CSV Verification Committee

Keith Oldham, MD, FACS, CSV Verification Committee Chair

Robert Sawin, MD, FACS, CSV Verification Committee

David Tuggle, MD, FACS, CSV Verification Committee

Anna Varughese, MD, CSV Verification Committee

Jaqueline Saito, MD, MSCI, CSV Data Committee Chair

Shawn Rangel, MD, MSCE, CSV Data Committee

Brian Brighton, MD, MPH, CSV Data Committee

Charles Hughes, MD

Douglas Miniati, MD

American College of Surgeons Staff Contributors

Clifford Y. Ko, MD, MS, MSHS, FACS, Director,

Division of Research and Optimal Patient Care

Sameera Ali, MPH, Administrative Director,

Division of Research and Optimal Patient Care

Catherine Grant, BSN, RN, Children's Surgery

Program Manager

Emily Jones, Children's Surgery Project Manager

Shelby Eagle, MPH, Children's Surgery Program Coordinator

About the Children's Surgery Verification Quality Improvement Program

The American College of Surgeons was founded in 1913 on the basic principles of improving the care of surgical patients and strengthening the education of surgeons. The Task Force for Children's Surgical Care, an ad hoc multidisciplinary group of invited leaders in relevant disciplines, was convened 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 and ensure that children's individual needs are matched to the resources of their care environment. The composition of the initial task force is detailed in *Optimal Resources for Children's Surgical Care v.1*. The group represented key disciplines and perspectives. Published literature and data were used when available, and expert opinion was used 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.

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]. *Optimal Resources for Children's Surgical Care v.1* 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.

The ACS Children's Surgery Verification Committee was established with this goal of improving the care of children with surgical needs. Achievement of the goal of defining optimal resource standards and matching these prospectively to an individual child's needs requires an appropriately designed system of care and includes verification that these standards are met in individual children's surgical centers. It has always been recognized that continuous review and improvement of this document would be necessary 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 and combined it with expert opinion to

establish consensus and formulate these current standards. Multiple research efforts are under way to strengthen the evidence base.

We believe that these standards reflect a pragmatic 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 are likely to improve clinical outcomes for children. 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 to inform and sustain the next generation of surgeons. It is a multidisciplinary effort undertaken with specialty societies and representatives who speak for those across the entire continuum of children's surgical care. This version of the standards document will also be subject to evolution and revision as practice continues to change and improve. We have already begun planning for the third version of these standards.

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 this 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 suboptimal use of precious medical resources. In an era where value is a public demand, we must not only strive for optimal care, but we must 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. 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 they will supplement rather than supplant various state and other existing administrative processes.

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 service 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 III centers. A Level I facility will provide support for centers with less robust children's resources. This should be determined locally to ensure appropriate use of available resources. In less densely populated and rural areas, Level II and III hospitals will be essential. Likewise, cooperative relationships with other centers are needed. Because a large proportion of children with surgical needs receives 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 geographic area is essential.

In most children's health care systems, a combination of centers of various levels will coexist with other facilities. The children's surgical care system must institute relevant facility and personnel standards. This document is intended to facilitate this process by establishing these standards. We have attempted to emphasize resource differentiation between centers.

We hope that one of the outcomes of this work is 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 hospitals that receive payment from the Department of Health and Human Services and Centers for Medicare & Medicaid Services (CMS) for 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.

Standards Update

Discovery for the second version of these standards began in Fall 2019 with a recategorization of the original version one standards into nine categories of standards common to all the ACS quality programs within the various accreditation and verification programs. The first version of our standards was recategorized into the nine chapters during the revision process. This manual also follows a common template utilized by all ACS accreditation and verification programs, stating the rationale, expectations, required documentation, and resources (if applicable) for all standards.

The ACS “Nine Standards” for Optimal Care will be uniform across all quality programs, with variation within the standards based on the individual accreditation and verification programs:

1. Institutional Administrative Commitment
2. Program Scope and Governance
3. Facilities and Equipment Resources
4. Personnel and Services Resources
5. Patient Care: Expectations and Protocols
6. Data Surveillance and Systems
7. Quality Improvement
8. Education: Professional and Community Outreach
9. Research

The standards are now categorized into these chapters by facilities, personnel, protocols, and so on. Due to this categorization, some standards related to specific units or topics are defined in multiple chapters. For example, standards related to the OR will now be in multiple chapters (Chapters 3, 4, and 5). We have created a reference that lists groups of related standards, and it can be found in Appendix VI Related Standards.

Revision of the standards was completed by chapter workgroups composed of members of the CSV Verification Committee and representatives of the Children’s Surgery Data Committee. The goals of the workgroups were to identify new standards that would provide a direct benefit to patients, clarify and/or eliminate standards that were not achieving the intended result, and incorporate Specialty Hospital standards. Feedback regarding a final draft of these standards was solicited during a stakeholders meeting hosted by the ACS CSV Program on September 23, 2020 (Appendix V).

Additional content updates include clarification of areas of confusion, improved detail of vague standards, improved description of levels, inclusion of the Specialty Hospital category, and a collapse of redundant standards.

Value of CSV Verification

CSV verification provides real value to children’s surgical programs. Programs can publicly demonstrate to their communities, providers, payors, and the government that they have invested in systems directed toward pediatric surgical patients receiving high-quality, coordinated care. Programs can also demonstrate that they have made the effort to provide supportive services and resources addressing the full continuum of care in their communities. CSV verification requires data reporting to, and feedback from, the ACS National Surgical Quality Improvement Program Pediatric (ACS NSQIP Pediatric) Program to assess hospital performance (Level I and Level II centers). These data systems allow hospitals to compare their quality of care, identify variations, and implement improvements to demonstrate the high quality of care that they provide and their commitment to continuous quality improvement. CSV verification provides your program with an infrastructure and data that inform care. It also gives your team opportunities for leadership development, team building, and programmatic development.

Levels of Verification

“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.... 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.” (*Optimal Resources*, Introduction, p. 11).

The CSV Program recognizes that these resource standards are guidelines and are not meant to be prescriptive or restrictive if a center’s expertise extends beyond the standard, but the procedures are done safely, and quality is monitored by the Performance Improvement and Patient Safety Committee.

Table 1. Summary of children’s surgical center standards with expected scope of services

	LEVEL I	LEVEL II	LEVEL III	Specialty Musculoskeletal	Specialty Oncology
Age	Any	Any	> 6 months	Any	Any
ASA	1–5	1–3*	1–2	1–5	1–5
Co-Morbidities	All – complex	Typically, single or multiple specialty management	None – healthy children	All – complex	All – complex
Operations†	All – complex diseases, multispecialty care	Common anomalies, single specialty or multiple specialty care	Common “low-risk” procedures by single specialty	All – complex musculoskeletal diseases, multispecialty care	All – complex oncology-related diseases, multispecialty care
Ambulatory‡	ASA 1–3, guidelines for post-anesthesia monitoring	ASA 1–3, guidelines for post-anesthesia monitoring	Age > 6 months, Healthy children	ASA 1–3, guidelines for post-anesthesia monitoring	ASA 1–3, guidelines for post-anesthesia monitoring

Abbreviations: ASA, American Society of Anesthesiologists perioperative risk score

*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.

†For neonates, 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 must be included when the ambulatory site is an integrated site of the parent institution and is served by the same medical staff in these recommended levels of institutional designation. The site of care may be physically attached to, or integrated into, the hospital and must be a component of a demonstrably integrated children’s health care delivery system that provides these defined resources.

Level I

A Level I children's surgical center is a regional resource and tertiary- or quaternary-care facility central to the children's health care system. A Level I children's surgical center 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 and is expected to manage large numbers of patients. A Level I children's surgical center is likely to be in a population-dense area and must perform at least 2,000 surgical procedures for children < 18 years of age annually. The scope of care at a Level I center includes care for major congenital anomalies and complex diseases, requiring a multidisciplinary team.

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, a Level I center also has a responsibility to assist families with managing their travel burden, as well as providing psychological, spiritual, and social support.

Research and education programs, as defined in this document, should be part of Level I children's surgical center verification, but alignment with a medical school is not required. 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, continuing medical education (CME), preceptorships, personnel exchanges, and other approaches appropriate to the local situation. The effort in this second version of the standards is to provide a variety of options by which a center can meet this requirement without being a dedicated academic medical center. The intent is to make this program accessible while still improving future care.

Level I Specialty Musculoskeletal

In July 2019, the ACS CSV Quality Improvement Program officially released a specialty hospital option. A children's specialty hospital is defined as a children's hospital with Level I resources that provides a limited range of services specific to

various conditions or related to a specific disease process. A Children's Surgery Verification Level I Specialty Musculoskeletal Hospital is a highly specialized hospital providing treatment for orthopaedic and neuromusculoskeletal conditions and injuries that offers a narrower scope of pediatric surgical services than a Level I children's surgical center. These conditions include, but are not limited to, cerebral palsy, chest wall deformities, spina bifida, pediatric scoliosis, athletic injuries and fractures, and spinal cord injuries. Musculoskeletal hospitals may also treat patients with craniofacial conditions. Due to the specialized nature of specialty musculoskeletal hospitals, it is not expected that these institutions have neonatal intensivists or pediatric emergency physicians, but pediatric critical care is a requirement. Specialty musculoskeletal centers must have appropriate protocols and provisions for their patients requiring emergency care.

Level I Specialty Oncology

A Children's Surgery Verification Level I Specialty Oncology Hospital is a highly specialized hospital that specifically treats pediatric surgical patients with oncological diagnoses and related conditions. A specialty oncology center targets these conditions using differentiated treatments in the areas of chemotherapy, radiation, surgical interventions, and immunotherapy. Due to the specialized nature of specialty oncology hospitals, it is not expected that oncological centers have neonatal intensivists or pediatric emergency physicians, but pediatric critical care is a requirement. Specialty oncology centers must have appropriate protocols and provisions for their patients requiring emergency care.

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 may or may not be able to provide the same comprehensive care as a Level I children's surgical center. Therefore, patients with more complex, and particularly multidisciplinary needs may require transfer to a Level I center. In this case, transfers to a higher level of care will be supported by transfer agreements and protocols. 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.

The 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 center may complement the clinical activity of a Level I center. The second environment occurs in less densely populated areas where the Level II center will serve as the main resource center for a geographical area remote from a Level I center.

The scope of service for a Level II center potentially includes definitive care for neonates, infants, children, and adolescents; in some cases, it may be limited to neonates or other specific populations (women's and children's centers, military hospitals, or others). Although the procedures may involve more than one specialty, the center generally takes care of more common anomalies and diseases that are typically treated by most children's surgical specialists in that discipline. Depending on location and available resources, patients may or may not require significant and complex multispecialty coordination.

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 can also arrange for transfer to a facility that can provide definitive surgical care. Generally, Level III patients will be children without comorbidities (ASA 1-2) and without the need for multidisciplinary care. Level III procedures will generally be common, low-risk procedures typically performed by a single specialty.

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 to the referring Level III hospital. Likewise, the Level III hospital would provide feedback to their referring hospital(s) for children transferred to their care.

Level III children's surgical centers should demonstrate outreach activities to the local community and education programs for nurses, physicians, and allied health care workers involved with pediatric care.

Ambulatory

Off-site ambulatory surgical centers that are operated by applicant institutions must be included in the application for sites pursuing Level I, II, and III verification in this second version of the standards. The children's ambulatory surgical centers must be fully integrated with a Level I, II, or III inpatient children's surgical center. Personnel at the ambulatory centers are required to have the same qualifications and training as at the parent center. Ambulatory surgical centers must have treatment protocols for resuscitation, transfer protocols, and data reporting and must participate in systems for performance improvement.

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 Surgery Patients and 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.

A defined relationship demonstrating integration with a Level I, II, or III children's surgical center 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 within the same system 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

CSV Verification Process for Initial Applicants	CSV Reverification Process for Renewal Applicants
Application <ul style="list-style-type: none"> Review CSV standards to determine eligibility and appropriate designation level for your center Submit online application (available at <i>facs.org</i>) Upon approval of application, center will be sent login information for the online verification portal 	Pre-Review Questionnaire (PRQ) <ul style="list-style-type: none"> Review CSV standards to confirm ongoing eligibility and appropriate designation level for your center Schedule site visit within one month of verification anniversary date Renewal PRQ becomes available nine months prior to reverification site visit date Log in to online verification portal to complete and submit PRQ and confirm center information is up to date Center must meet all applicable standards at the time of PRQ submission
Pre-Review Questionnaire (PRQ) <ul style="list-style-type: none"> Center executes contract and pays annual participation fee prior to opening the PRQ Six months of ACS NSQIP Pediatric data must be collected prior to opening the PRQ (Level I and II centers) Complete and submit PRQ via online verification portal Center must meet all applicable standards at the time of PRQ submission 	Site Visit <ul style="list-style-type: none"> Center is assigned a Site Visit Reviewer Team and must complete a site visit within 30 days of verification anniversary date
Site Visit <ul style="list-style-type: none"> Center is assigned a Site Visit Reviewer Team and must complete a site visit within three to six months of PRQ submission 	Outcome <ul style="list-style-type: none"> Center will be notified of verification decision and receive the Verification Report approximately five to 10 weeks after the site visit If verified, the center is renewed for a new three-year term from the date of renewal site visit Center submits renewal application at three years
Outcome <ul style="list-style-type: none"> Center will be notified of verification decision and receive the Verification Report approximately five to 10 weeks after the site visit Center's verification is effective retroactive to the date of the site visit and remains verified for a three-year term Center submits renewal application at three years 	



AMERICAN COLLEGE OF SURGEONS
CHILDREN'S SURGERY VERIFICATION QUALITY IMPROVEMENT PROGRAM

1 Institutional Administrative Commitment

1.1 Institutional Commitment

Rationale

A decision by a hospital to become a children's surgical center requires the commitment of the institutional governing body and the medical staff. 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 infants and children with surgical needs within the institution and regionally.

Definition and Requirements

All Levels

The elements of a Children's Surgery Verification (CSV) Program include the following: (1) appropriate hospital organization and support, (2) medical staff support, (3) the role(s) of Medical Director of Children's Surgery (MDCS), (4) the roles of (a) Medical Director of Children's Anesthesia (MDCA), (5) the Children's Surgery Program Manager (CSPM), (6) quality and outcomes data collection, (7) the multidisciplinary performance improvement and patient safety (PIPS) committee, and (8) participation in regional children's service delivery. Items three through eight are detailed in subsequent chapters.

- Surgeon commitment is essential for a properly functioning children's surgical center.
- A decision by a hospital to become a children's surgical center requires the commitment of the institutional governing body, and this support must be reaffirmed in writing continually (every three years) and must be current at the time of verification.
- A decision by a hospital to become a children's surgical center requires the commitment of the medical staff, and this support must be reaffirmed in writing continually (every three years) and must be current at the time of verification.
- The program, including PIPS, must be approved by the hospital's governing body, and 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.
- Use of patient outcomes and process data must drive improvement of care and system processes for all levels of verification.
- Sufficient authority for the children's surgery verification program to achieve all programmatic goals must be reflected in the organizational structure of the applicant center.
- Regional system planning and collaboration must be demonstrated.

Documentation

- Written letters of support from the institutional governing body and medical staff expressing support of the children's surgical program are required. Support must be reaffirmed continually (every three years) and must be current at the time of verification.
- The medical staff letter must provide acknowledgment and commitment of the medical staff to provide appropriate specialty care as defined in these standards to support the optimal care of children with surgical needs.
- Surgeon commitment/engagement verified at site visit.

Resource

Hoyt DB, Ko CY. *Optimal Resources for Surgical Quality and Safety*. Chicago, IL: American College of Surgeons; 2017.

1.2 Administrative Structure

Rationale

A decision by a hospital to become a children's surgical center requires the commitment of the institutional governing body and the medical staff. 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 infants and children with surgical needs both internally and regionally.

Definition and Requirements

All Levels

The children's surgical program involves multiple disciplines and transcends 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 in all phases of care. Representatives of all disciplines provide the appropriate children's skills; all 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.

- Each children's surgical center must be able to provide on their campuses the necessary human and physical resources to properly provide children's surgical care consistent with level of verification.
- The administrative structure of the hospital must include, at a minimum, a surgical administrator, Medical Director of Children's Surgery (MDCS), Medical Director of Children's Anesthesiology (MDCA), and Children's Surgery Program Manager (CSPM) who are each committed to the surgical center. Responsibilities and authority for each must be defined, and programmatic support must be demonstrable. The roles and responsibilities may be allocated among individuals by the institution, for example a Surgeon-in-Chief and a Chief Surgical Quality Officer might share the roles defined for the MDCS in this document or one or the other may fulfill the role. The requirement is the institution delineate and assign responsibilities and fulfill the programmatic standards put forth in this document (See Standard 2.9). Appropriate administrative support also 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.

- The hospital's administrative structure must support the children's surgery program. The CSPM must report to an administrative level that best supports the role and responsibilities of the position, as well as to the MDCS. An appropriate organizational chart must be provided.
- In the United States virtually all health care facilities that provide surgical care for children receive Federal dollars. These centers are required to enter into formal agreements of participation with Centers for Medicare and Medicaid Services (CMS). These agreements require several features relevant to the ACS CSV program, including medical staff organization, provider credentialing, quality and safety systems and processes, and others. If applicable, the applicant center must fully and currently meet all CMS Conditions of Participation.

Documentation

- Provide an organizational chart that demonstrates the medical staff and administration relationships within the institution.
- Adequate funding of the children's surgery program by the institution is required. A written summary of program organization and support must be provided.

Resource

Hoyt DB, Ko CY. *Optimal Resources for Surgical Quality and Safety*. Chicago, IL: American College of Surgeons; 2017.



AMERICAN COLLEGE OF SURGEONS
CHILDREN'S SURGERY VERIFICATION QUALITY IMPROVEMENT PROGRAM

2 Program Scope and Governance

2.1 Hospital Governance

Rationale

Basic to qualification for any surgeon is board certification by the American Board of Surgery, or other relevant board of the American Board of Medical Specialties (ABMS), or an equivalent organization such as the Bureau of Osteopathic Specialists or the Royal College of Physicians and Surgeons of Canada. Board certification or equivalent, as defined by the center, is essential for surgeons who provide on call coverage and care in Level I, Level I specialty hospitals, Level II, and Level III and ambulatory children's surgical centers. It is acknowledged that many boards require a period of clinical practice and development of a case log after completing a residency approved by the Accreditation Council for Graduate Medical Education (ACGME), the American Board of Osteopathic Specialties, or an equivalent entity. Completion of certification may take three to seven years. 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 seven years after successful completion of an ACGME or Canadian residency, the physician usually is no longer eligible for board certification or inclusion on the children's surgical team without additional training. A physician may be included if given recognition by a major professional organization in the designated specialty and continues to be credentialed by the applicant organization. On a case-by case basis, alternative training and certification may be judged equivalent by the applicant center and the American College of Surgeons. See Standard 4.1 Surgeons for further details.

Definition and Requirements

All Levels

- The credentialing body of the hospital will ensure that qualifications of the practicing providers are current and reflect contemporary training and experience and are specific to the care of children.

Documentation

- Briefly describe how this is done for both initial credentialing and for recertification.

Resource

American Board of Medical Specialties. Available at: abms.org. Accessed April 8, 2021.

2.2 Surgical Volume Requirement

Rationale

A verified children's surgical center must perform an adequate number of surgical procedures to provide ongoing team and individual experience. A surgical procedure is **defined as a case requiring general anesthesia**. Many studies show better results, fewer complications, and shorter hospital stays when newborns and children undergo surgical procedures in environments that have expert resources for pediatric patients. There is compelling data in the pediatric anesthesia literature, closed claims data, and the Pediatric Perioperative Cardiac Arrest (POCA) registry showing a clear increase in complications for infants and young children. Surgical volume (volume–outcome relationship) has been identified as an important predictor of operative morbidity and mortality.

Definition and Requirements

Level I

- Children's surgical center must perform at least 2,000 surgical procedures on patients younger than 18 years annually.

Level I Specialty Musculoskeletal, Level I Specialty Oncology, and Level II

- Children's surgical center must perform at least 1,000 surgical procedures on patients younger than 18 years annually.

Level III

- There is no minimum surgical volume requirement for Level III center verification.

Documentation

- Provide the PRQ Surgical Case Volume table.

Resources

Chang RK. *Pediatrics*. 2002;109(2):173-181.

Cheney FW, Warner DS. The American Society of Anesthesiologists Closed Claims Project: The Beginning. *Anesthesiology*. 2010;113:957-960. doi: <https://doi.org/10.1097/ALN.0b013e3181ef6786>

Greene NH, Bhananker SM, Posner KL, Domino KB. The Pediatric Perioperative Cardiac Arrest (POCA) Registry. In: Barach P, Jacobs J, Lipshultz S, Laussen P (eds). *Pediatric and Congenital Cardiac Care*. London: Springer; 2015. https://doi.org/10.1007/978-1-4471-6566-8_9

Kastenbergl. *JAMA Pediatr*. 2016;169(1):26-32.

Pasquali SK. *JAMA*. 2015 Oct;314(16):1689-1690.

Sathya C. *JAMA Surg*. 2015;150(9):874-881.

2.3 Surgical Infrastructure

Rationale

A children's surgical service represents a structure to provide care for children with surgical needs. The service includes personnel, processes, and other resources necessary to ensure the appropriate and efficient provision of surgical care. This 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.

Definition and Requirements

All Levels

- 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.
- Enough infrastructure and administrative support are required for the children's surgical service to ensure adequate team-based care for the child and family.

Documentation

- Provide figure depicting the relationship of the surgical service(s) to the hospital at large.
- Provide composition and structure of the team for each of the children's surgical services. For example, number of faculty, physician assistants, nurse practitioners, fellows, residents, and others that form the medical care team.

Resources

McAteer JP, Kwon S, Lariviere CA, Oldham KT, Golding AB. Pediatric specialist care is associated with a lower risk of bowel resection in children with intussusception: A population based analysis. *J Am Coll Surg.* 2013;217(2):226-232.

McAteer JP, Richards MK, Stergachis A, et al. Influence of hospital and patient location on early postoperative outcomes after appendectomy and pyloromyotomy. *J Ped Surg.* 2015;50(9):1549-1555.

2.4 Operating Room (OR) Committee

Rationale

A process must be in place to address children's surgical program operational issues and ensure high-quality and safe care. 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.

Definition and Requirements

In Level I, Level I specialty, 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. See Standard 2.5 Ambulatory Surgery Patients and Ambulatory Surgical Center for further details.

Level I, Level I Specialty Musculoskeletal, Level I Specialty Oncology, and Level II

- A process must be in place to address children's surgical program operational issues.
- The relevant committee must develop documentation (minutes) that reflects participants as well as the review of operational issues and, when appropriate, the analysis and proposed corrective actions.

Level III

- The committee that addresses children's surgical program operational issues may be integrated into existing institution-wide processes, but there must be separate children's discussion or subcommittee activity documented that adequately addresses children's surgical issues.

Documentation

- Minutes from representative OR other relevant children's committee meetings available onsite for review.

2.5 Ambulatory Surgery Patients and Ambulatory Surgical Center

Rationale

Free-standing ambulatory centers that are owned and operated by the parent applicant center (and care for pediatric patients) are required to be included in this verification process. Ambulatory surgery plays an important role in the contemporary medical care of infants and children. Because of the relatively high incidence of postanesthetic apnea in young children, especially infants with a history of prematurity, experienced personnel and protocols to minimize this potentially fatal complication are required. For optimal outcomes, ambulatory children's surgery must be performed in facilities with specific children's resources and policies.

Definition and Requirements

All Levels and Ambulatory Surgical Center(s)

- An Ambulatory Surgery Patients and Ambulatory Surgical Center (ASC) must be demonstrably integrated with a Level I, II, or III children's surgical center.
- Ambulatory surgical centers must meet the operating room resource standards, and the on-site ambulatory care team must possess pediatric training and experience consistent with the level of requested verification.
- A pediatric anesthesiologist, pediatric surgeon, or other specialty-trained children's surgeon must serve as the medical director for the children's ambulatory surgical program.
- A pediatric anesthesiologist (Level I or Level II) or an anesthesiologist with pediatric expertise (Level III) must administer or directly oversee the administration of general anesthesia to all patients two years or younger who are undergoing a surgical procedure.
- Physicians appropriately trained in and who hold privileges for deep sedation in children may provide procedural sedation for children undergoing non-surgical procedures. In different institutions, procedural sedation is done by pediatric critical care, pediatric emergency medicine, or pediatric hospital medicine. The chief of anesthesiology, or their appointed chair/chief of anesthesia for the ASC acting on behalf of the chief of anesthesiology, must have oversight responsibility for all procedural sedation at the ASC.
- The preoperative preparation and postoperative recovery of children must occur in a post-anesthesia care unit separate from adult patients and appropriate for pediatric patients.
- The special needs for a child's social and emotional comfort must be considered in the facility design and patient care protocols of a pediatric ambulatory surgical center.
- Anesthesia and other equipment, including resuscitation devices, appropriate pharmacologic supplies, and drug doses for all sizes of children must be readily available in all pediatric ambulatory ORs and recovery areas.
- 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.
- Formal transfer agreements and 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. These guidelines must be monitored by the PIPS process. See Standard 2.7 Referrals within Region for further details.

The hospital must have a policy or recommendations regarding general anesthesia for healthy, full-term infants older than four weeks and younger than six months and include guidelines for postoperative monitoring after surgery. These guidelines should include recommendations for timing of these cases (for example, earlier in the day), postoperative monitoring for infants younger than three months who receive perioperative opioids, and exceptions to administration of general anesthesia in the outpatient setting. Age after birth for a preterm infant is now called post-menstrual age rather than postconceptional age. Exceptions should be specifically stated (for example, full-term infants younger than four weeks and preterm infants younger than 50 weeks post-menstrual age are generally not appropriate candidates for surgery on an outpatient basis). The most conservative approach is to admit (for monitored 12- to 24-hour observation) all preterm infants younger than 60 weeks post-menstrual age. Different hospitals have different post-menstrual age guidelines for admission. The incidence of significant apnea and bradycardia is highest in the first four to six hours after surgery but has been reported up to 12 hours after surgery. A widely accepted guideline is to monitor all preterm infants younger than 50 weeks post-menstrual age for at least 12 hours after surgery. In addition, outpatient or elective/non-urgent surgery may be delayed in preterm infants younger than 50 weeks post-menstrual age if possible.

- Each institution must have established quality criteria and a mechanism to track complications, emergency department visits, or readmissions within 72 hours, and transfers to an inpatient facility after the provision of outpatient care including general anesthesia. This must be integrated into the parent center PIPS process.

Documentation

- Provide diagram of administrative structure of the Ambulatory Surgical Center.
- Provide credentials of the Ambulatory Surgery Medical Director and Nursing Director.
- Provide “Policies and Procedures” for preterm infants and full-term infants < six months, including inclusion and exclusion criteria for ambulatory care and formal discharge criteria.
- Provide formal transfer agreements from Ambulatory Surgery Patients and Ambulatory Surgical Center to parent children’s hospital.
- Provide minutes of Ambulatory Surgery Patients and Ambulatory Surgical Center OR Committee meetings.
- Provide minutes of PIPS meetings related to Ambulatory Surgery Patients and Ambulatory Surgical Center issues.
- Provide credentials of Ambulatory Surgery Patients and Ambulatory Surgical Center physician leadership.
- Provide Anesthesia Director CV if different from medical director.
- Pediatric-specific training of nursing and paramedical personnel (including current PALS certification).
- Tour of the facility at site visit.

Resources

Coté CJ, Posner KL, Domino KB. Death or neurologic injury after tonsillectomy in children with a focus on obstructive sleep apnea: Houston, we have a problem! *Anesth Analg*. 2014;118(6):1276-1283.

Coté CJ, Zaslavsky A, Downes JJ, et al. Postoperative apnea in former preterm infants after inguinal herniorrhaphy. *Anesthesiology*. 1995;82(4):809-821.

Cited from *Critical Elements for the Pediatric Perioperative Anesthesia Environment*. Polaner D, Houck C (lead authors). Policy statement of the AAP Section on Anesthesiology and Pain Medicine. *Pediatrics*. 2015;136(6):1200-1205.

Davidson AJ, Morton NS, Arnup SJ, et al; General Anesthesia Compared to Spinal Anesthesia (GAS) Consortium. Apnea after awake regional and general anesthesia in infants: The General Anesthesia Compared to Spinal Anesthesia Study—Comparing apnea and neurodevelopmental outcomes, a randomized controlled trial. *Anesthesiology*. 2015;123(7):38-54.

Engle W, et al. Age terminology during the perinatal period. *Pediatrics*. 2004;113(5):1362.

2.6 State and/or Regional System Planning

Rationale

As the scope of activity for the provision of optimal children's surgical care expands from single centers to multifaceted systems, it becomes increasingly important that verified centers be effectively engaged in all aspects of system planning, implementation, and evaluation within their regions. This system involvement is most often exemplified by pediatric trauma care, but cancer care, multidisciplinary clinical care for special needs pediatric patients, neuromuscular spine conditions, and other conditions that include the surgical subspecialties are all potential areas of excellence for a children's surgical center. Verified 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 region (Level I or Level II) have the additional challenge of engaging all other acute-care facilities, verified centers, and non-specialty hospitals in the performance improvement process for an inclusive children's surgical system.

Definition and Requirements

All Levels

- A children's surgical center must participate in the state and/or regional system planning, development, or operation, and this should extend beyond trauma system participation.
- 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, shared vision, and the state of system development.

Examples of participation by center staff include:

- 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

Documentation

- Provide a summary of the annual participation in state and/or regional system planning, development, or operation, detailing the context, aims, purpose, results, and implications of the project(s).
- This would include trauma outreach activities but should also include activities by other surgical subspecialty disciplines.
- Examples include outreach activities by pediatric and neonatal transport teams, multidisciplinary symposia, and interactive CME courses that teach pediatric specific skills (for example, PALS, EMS airway skills).

Resources

American College of Surgeons Committee on Trauma. Resources for Optimal Care of the Injured Patient. Available at: <https://www.facs.org/-/media/files/quality-programs/trauma/vrc-resources/resources-for-optimal-care.ashx>. Accessed April 8, 2021.

MacKenzie EJ, Rivara FP, Jurkovich GJ, Nathens AB, Frey KP, Egleston BL, Salkever DS, Scharfstein DO. A national evaluation of the effect of trauma-center care on mortality. *NEJM*. 2006;354:366-378.

2.7 Referrals within Region

Rationale

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 I specialty care, Level II, and Level III) is intended to assist communities in the development of their system for children's surgical care. A center's resources and infrastructure should be synchronous with the medical and access needs of the pediatric population to be served. 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. A goal of every system is to match the needs of patients to the capabilities of individual facilities. Proper triage and communication are critical features of a good system and are 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.

Definition and Requirements

All Levels

- Children's surgical center must accept referrals of all medically appropriate patients within their region from centers without the necessary children's surgical capacity, regardless of payor.

Documentation

- Discussion with hospital administration and personnel at the site visit.
- Describe the processes by which regional referrals are facilitated.

2.8 Transfer Agreements and Protocols/Guidelines

Rationale

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. 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. 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. Typically, a lower-level NICU would call for a Level IV NICU to send its transport team for a newborn. The value of transfer agreements is that they design the process for timely access to needed definitive and specialty care. This allows for consideration of the needs and expectations of both transferring and receiving hospitals and resolution of potential challenges 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. These plans should extend to any Ambulatory Surgery Patients and Ambulatory Surgical Center that provides surgical services to children.

Definition and Requirements

All Levels

- Children's surgical center must have written transfer agreements and transfer protocols/guidelines for specific services not locally available and such documents will specify appropriate transfer arrangements.
- The PIPS process must systematically review such transfers and a feedback process must be in place for receiving and originating institutions to communicate and collectively improve care.

Level I

- Transfer agreements and protocols/guidelines must be available for the institution's neonatal and pediatric transport teams.

Level II and Level III

- Written transfer guidelines approved by the MDCCS that define appropriate patients for transfer and retention are required.
- Relevant transfer agreements must be in place prospectively.

See Standard 2.5 Ambulatory Surgery Patients and Ambulatory Surgical Center for further details.

Documentation

- Level I: Transfer agreements and written protocols/guidelines will be required at the time of site visit.
- Level I Specialty Oncology, Level I Specialty Musculoskeletal, Level II, Level III: Transfer agreements and protocols/guidelines with either a Level I facility for services that are not available or with a transferring hospital will be required at the time of site visit.
- Documentation of PIPS review and feedback given/received.

Resources

EMS for children. Available at: <https://emscimprovement.center/>. Accessed April 8, 2021.

Owusu-Ansah S, Moore B, Shah MI, Gross T, Brown K, Gausche-Hill M, Remick K, Adelgais K, Rappaport L, Snow S, Wright-Johnson C, Leonard JC, Lyng J, Fallat M, Committee on Pediatric Emergency Medicine, Section on Emergency Medicine, EMS Subcommittee, Section on Surgery. Pediatric readiness in emergency medical services systems. *Pediatrics*. January 2020;145(1):e20193308.

Pediatric Readiness Toolkit. Available at: <https://emscimprovement.center/domains/hospital-based-care/pediatric-readiness-project/readiness-toolkit/>. Accessed April 8, 2021.

Remick K, Gaines B, Ely M, Richards R, Fendya D, Edgerton EA. Pediatric emergency department readiness among US trauma hospitals. *J Trauma Acute Care Surg*. 2019;86(5):803-809.

Remick K, Gausche-Hill M, Joseph MM, et al. Pediatric readiness in the emergency department. *Pediatrics*. 2018;142(5):e20182459.

2.9 Medical Director of Children's Surgery (MDCS) or Program Director (PD)

Rationale

The institution must have a surgeon who leads the multidisciplinary activities of the children's surgical program.

Definition and Requirements

All Levels

- The role must be fulfilled by a surgeon and is not intended to require a dedicated, full-time equivalent (FTE). This individual *may have* a title such as Surgeon-in-Chief (SiC), but the MDCS or PD of children's surgery may also be a stand-alone leadership responsibility within an organization if the SiC is primarily an administrative official. The intention is that the administrative team must include a MDCS/PD who is demonstrably active in clinical surgery with a principal responsibility for quality improvement. In larger organizations, this individual may be called a Surgical Quality Officer or Director of Quality, Surgical Safety Officer, or a leader with responsibility for both of these functions.
- The MDCS/PD must be a surgeon with current board certification (or equivalent) with special interest and qualifications in children's surgical care.
- The official job description must reflect the responsibilities outlined below and support dedicated time and compensation commensurate with duties assigned.
- If a center loses or changes its MDCS/PD for any reason, the center must notify the ACS CSV Program within 30 days. In this event, the center must appoint a new MDCS/PD.

- Works in cooperation with nursing administration to support the nursing needs of children with surgical problems.
- Develops treatment protocols and guidelines along with the surgical team.
- Coordinates the performance improvement and quality review process.
- Has authority to correct deficiencies in quality surgical care.
- The MDCS/PD and institutional surgical and medical subspecialty leaders must prospectively define the scope of practice of specialists who provide pediatric consultation but lack pediatric certification.
- There must be a written plan and relevant published call schedules for the provision of pediatric subspecialty care outside the limited scope of practice above, if this should be needed during periods when call coverage is provided by physicians or surgeons without pediatric certification or without specific pediatric credentials. The MDCS/PD and institutional subspecialty leaders must monitor compliance.
- The MDCS must ensure the dissemination and documentation of information derived from the PIPS process to participants in the children's surgical care program and to the hospital leadership.
- **Level III only:** Through the PIPS program and hospital policy or administrative authority, the MDCS in a Level III center must have responsibility for performance, quality review, and evaluation of each surgeon's ability to participate in children's surgical cases based on an annual review.

Medical Director of Children's Surgery responsibilities:

- Leadership: Provide the leadership for all CSV operations, including CSV implementation oversight and accruing necessary resources to assure that all standards are met.
- Committee oversight: Overseeing the performance improvement and patient safety (PIPS) committee.
- Membership and active participation in appropriate regional or national children's organizations.
- Authority to manage the surgical program.
- Participates in governance, including credentialing of surgeons with children's privileges.

Documentation

- Provide MDCS/PD CV.
- Provide MDCS/PD job description.
- Provide Surgeon-in-Chief job description if different from the MDCS.
- Provide Surgical Quality Officer job description if different from the MDCS.
- Provide an organizational chart demonstrating the medical staff and administration relationships within the institution.
- Provide call schedule for the last three months for services for which call coverage is provided by physicians or surgeons without pediatric certification or without specific pediatric credentials.
- Provide PRQ Non-Pediatric-Certified Surgeon Call table.
- By specialty, provide the written plan that defines the scope of practice for non-pediatric-certified surgeons and when pediatric-certified surgeons will become involved.

Resource

Hoyt DB, Ko CY. *Optimal Resources for Surgical Quality and Safety*. Chicago, IL: American College of Surgeons; 2017.

2.10 Medical Director of Children’s Anesthesiology (MDCA)

Rationale

Appropriate expertise in pediatric anesthesia and perioperative care of neonates, infants, and children has been demonstrated to significantly improve patient outcomes. Therefore, a core component of the institution’s commitment to the CSV Program is the role of Medical Director of Children’s Anesthesia (MDCA). This individual must have the oversight responsibility to ensure appropriately trained anesthesia personnel and resources are available for pediatric cases.

Definition and Requirements

All Levels

- The MDCA participates in the credentialing and privileging of anesthesiologists with children’s privileges, works in cooperation with the Medical Director of Children’s Surgery (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 surgical performance improvement and quality review process. The MDCA must have the authority to correct deficiencies in anesthesia care. This individual may have a title such as Chief of Pediatric Anesthesia, but the MDCA may also be a stand-alone leadership responsibility within a center, if the Chief of Pediatric Anesthesia is primarily an administrative official over a larger children’s hospital system of care.
- The MDCA (or designee) must serve as liaison to the children’s surgical PIPS program.
- The anesthesiology representative to the CSV Program must attend at least 50 percent of the multidisciplinary PIPS Committee meetings with documentation by the PIPS program.
- If a center loses or changes its MDCA for any reason, the center must notify the ACS CSV Program within 30 days. In this event, the center must appoint a new MDCA.
- The MDCA must be demonstrably active in the delivery of clinical anesthesiology services to infants and children.
- The Chief of Anesthesiology, or their appointed Chair/Chief of Anesthesia acting in the role of MDCA for the center, must have oversight responsibility for all procedural sedation. See Standard 2.5 Ambulatory Surgery Patients and Ambulatory Surgical Center for further details.

Level I, Level I Specialty Musculoskeletal, Level I Specialty Oncology, and Level II

- The MDCA is the anesthesiologist who has the authority to lead the multidisciplinary activities of the children’s program.
- This individual may have a title such as Anesthesiologist-in-Chief. For Level I and Level II centers, the director must be a pediatric anesthesiologist with current board certification (or equivalent).
- Membership and active participation in appropriate regional or national children’s organizations are essential for the MDCA in Level I and Level II centers and **are desirable in Level III facilities**. The MDCA’s responsibilities extend far beyond executing the technical skills of anesthesia delivery.

Level III

- An anesthesiology medical director, who is knowledgeable about pediatric perioperative needs, must be identified.

Documentation

- Provide the Anesthesiologist table.
- Provide MDCA job description.
- Provide MDCA CV or CV for Chief of Anesthesiology if not the MDCA.

Resources

Coté CJ, Zaslavsky A, Downes JJ, et al. Postoperative apnea in former preterm infants after inguinal herniorrhaphy. A combined analysis. *Anesthesiology*. 1995;82(4):809-822.

Polaner D, Houck C, Section on Anesthesiology and Pain Medicine. Critical Elements for the Pediatric Perioperative Anesthesia Environment. *Pediatrics*. 2015;136(6):1200-1205. doi: 10.1542/peds.2015-3595

2.11 Children's Surgery Program Manager (CSPM)

Rationale

The CSPM must play an active role in the administration and review of children's surgical care from admission through discharge to ensure high quality and safe care in partnership with the Medical Director of Children's Surgery and others relevant.

Definition and Requirements

All Levels

- The CSPM must play an active role in directing quality implementation and oversight of the CSV Program throughout the continuum of hospital care, including oversight of the ACS NSQIP Pediatric Program.
- The CSPM must show evidence of educational preparation and relevant clinical experience in the care of patients with surgical needs.
- The CSPM must have adequate FTE to be effective in the role. For a **Level I center**, the role requires a minimum of one full time equivalent (FTE) and must not be additive to the job of the OR Director or other individual

with responsibilities outside of the program. In **Level II or III centers**, the time commitment of the CSPM, with administrative oversight, must be demonstrably adequate for the institutional patient volume.

- For children's surgical safety reports (Appendix I), a process must be developed and implemented that ensures that the data-collection is completed by adequately trained staff whose performance is monitored to ensure high-quality data.
- The CSPM is required to attend PIPS Committee meetings.
- The CSPM must have a working relationship with the MDCS so that they function as a team.
- If a center loses or changes its CSPM for any reason, the center must notify the ACS CSV Program within 30 days. In this event, the center must appoint a new CSPM.

Documentation

- Provide CSPM CV.
- Provide CSPM job description.

Qualifications and Activities of the Children's Surgery Program Manager (CSPM)

The CSPM, usually a registered nurse, must show evidence of educational preparation, and clinical experience in the care of children undergoing surgery. There should be a written job description that defines sufficient authority to do the job and clearly outlines the responsibilities of the individual. Activities 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 in-hospital patients, and serving as a resource for clinical practice.
Education Responsibilities	Provide the 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 surgery program. Serve as a liaison to administration, and represent the children's surgery 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.
Consultant 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.

2.12 ACS NSQIP Pediatric Surgeon Champion (SC)

Rationale

The Surgeon Champion of the ACS NSQIP Pediatric Program serves as a resource for the Surgical Clinical Reviewer (SCR). This surgeon champion is a local liaison to the ACS NSQIP program and a local advocate for quality initiatives. They will share ACS NSQIP learning, best practices, and case studies with staff and surgeons as an educational opportunity. Data is used as a quality diagnostic tool, to benchmark to other children's hospitals, and to identify areas for improvement.

Definition and Requirements

Level I, Level I Specialty Musculoskeletal, Level I Specialty Oncology*, and Level II

The Surgeon Champion is the main advocate and mentor for the ACS NSQIP Pediatric Program and has the primary role of guaranteeing the success of the program. The Surgeon Champion is a stand-alone role that is separate from the MDCS. The Surgeon Champion is responsible for assuring that data collected by ACS NSQIP Pediatric is of the highest quality and is used to direct quality improvement efforts. The Surgeon Champion also facilitates adoption of ACS NSQIP Pediatric initiatives at the center. The Surgeon Champion may or may not also serve as the overall leader for surgical quality improvement but must be a member of the group responsible for these efforts and is considered an essential member of the CSV team.

- The Surgeon Champion is the primary physician partner for ACS NSQIP Pediatric. The Surgeon Champion and SCR work as a team. The ACS NSQIP Pediatric Surgeon Champion is responsible for overseeing ACS NSQIP Pediatric activities.
- The ACS NSQIP Pediatric Surgeon Champion will be responsible for reviewing the program's Semiannual Report (SAR) and for addressing areas of improvement.
- The ACS NSQIP Pediatric Surgeon Champion should be a regular member of the PIPS Committee.

- The ACS NSQIP Pediatric Surgeon Champion will actively participate in the ACS NSQIP Pediatric Program by participating in children's surgery calls and periodically attending the ACS Quality and Safety Conference.
- If a center loses or changes its ACS NSQIP Pediatric Surgeon Champion for any reason, the center must notify the ACS CSV within 30 days. In this event, the center must appoint a new ACS NSQIP Pediatric Surgeon Champion.

***For Level I Specialty Oncology Centers:** Participation in ACS NSQIP Pediatric will be required when there is a relevant procedure-specific module. At present, best available risk-adjusted peer-comparable data must be used for quality improvement. If a Level I Specialty Oncology Center participates in ACS NSQIP Pediatric, an ACS NSQIP Pediatric Surgeon Champion is required.

Documentation

- Provide ACS NSQIP Pediatric Surgeon Champion job description.
- Provide ACS NSQIP Pediatric Surgeon Champion CV.

Resources

Hoyt DB, Ko CY. *Optimal Resources for Surgical Quality and Safety*. Chicago, IL: American College of Surgeons; 2017.

Raval MV, Bentrem DJ, Eskandari MK, et al. The role of surgical champions in the American College of Surgeons National Surgical Quality Improvement Program: A national survey. *J Surg Res*. 2011;166(1): e15-25. PMID: 21176914; DOI: 10.1016/j.jss.2010.10.036 <https://pubmed.ncbi.nlm.nih.gov/21176914-the-role-of-surgical-champions-in-the-american-college-of-surgeons-national-surgical-quality-improvement-program-a-national-survey/>

2.13 ACS NSQIP Pediatric Surgical Clinical Reviewer (SCR) and Other Data Collection Personnel

Rationale

High-quality data begin with high-quality data abstraction and require ongoing maintenance to ensure that the quality endures. The amount of time and effort that will be necessary to maintain the data-collection process should not be underestimated. 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 Program. A verified and well-trained SCR is critical to the success of ACS NSQIP data collection. At Level III centers and children's ambulatory surgical centers, appropriate data-collection staffing must be demonstrated.

This staffing need increases if additional data elements are collected. Hospitals must also consider 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.

Definition and Requirements

Level I, Level I Specialty Musculoskeletal, Level I Specialty Oncology*, and Level II

- SCRs must complete the ACS NSQIP Pediatric training prior to assuming the role of SCR. SCRs must successfully complete the ongoing scheduled examinations and audit process as determined by the ACS NSQIP Pediatric Program. The MDCCS, CSPM, and ACS NSQIP Surgeon Champion will be responsible for verifying this process.
- For children's surgical safety reports (Appendix I), 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.

- Appropriate data collection staffing, in addition to the CSPM, must be demonstrated commensurate with the level of program.
- If a center loses or changes its SCR for any reason, the center must notify the ACS CSV within 30 days. In this event, the center must establish a new SCR, including the required training, examination, and audit process as described.
- The SCR will actively participate in the ACS NSQIP Pediatric Program by participating in the children's surgery conference calls and, with administrative support, periodically attending the ACS Quality and Safety Conference.

***For Level I Specialty Oncology Centers:** Participation in ACS NSQIP Pediatric is required when there is a relevant procedure-specific module developed. At present, best available risk-adjusted peer-comparable data must be used for quality improvement. If Level I Specialty Oncology Centers participate in ACS NSQIP Pediatric, an ACS NSQIP Pediatric Surgical Clinical Reviewer is required.

Documentation

- Provide SCR job description or data collection staff member job description.
- Provide SCR CV or data collection staff member CV.

Resources

Hoyt DB, Ko CY. *Optimal Resources for Surgical Quality and Safety*. Chicago, IL: American College of Surgeons; 2017.

Saito JM, Chen LE, Hall BL, et al. Risk-adjusted hospital outcomes for children's surgery. *Pediatrics*. 2013;132(3):e677-688.



AMERICAN COLLEGE OF SURGEONS
CHILDREN'S SURGERY VERIFICATION QUALITY IMPROVEMENT PROGRAM

3 Facilities and Equipment Resources

3.1 Neonatal Intensive Care Unit (NICU)

Rationale

A neonatal ICU is a critical resource for a children's surgery center. Optimal NICU resources have been defined since the 1970s. Level IV NICU resources are required for verification as an ACS Level I children's surgical center. A Level I children's surgical center requires 24/7 neonatologist coverage and all other Level IV NICU personnel and capabilities. Level IV NICUs must maintain a full range of pediatric medical subspecialists, children's surgical subspecialists, and pediatric anesthesiologists onsite; the index institution is the primary site of practice. Level III or higher NICU resources are required for a Level II ACS children's surgical center verification. 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. See Standard 4.5 NICU Personnel for more details.

Definition and Requirements

Level I

- A Level I children's surgical center is required to provide resources consistent with Level IV NICU designation as delineated in current American Academy of Pediatrics recommendations.
- It is not required that Level I Specialty Musculoskeletal and Oncology Centers will have a NICU, or neonatal critical care services.

Level II

- A Level II children's surgical center must have a Level III or higher NICU as delineated in current American Academy of Pediatrics' recommendations.

Documentation

- Provide the PRQ Medical Specialists table.
- If the hospital has been verified as to NICU level by the state, that documentation should be included with the PRQ.
- Describe the facilities and resources adequately to support either Level III or IV NICU status.

Resources

American Academy of Pediatrics. Levels of neonatal care: Committee on Fetus and Newborn. *Pediatrics*. 2012;130(3):587-597. Reaffirmed 2015.

Bezner SK, Bernstein IH, Oldham KT, Goldin AB, Fischer AC, Chen LE. Pediatric surgeons' attitudes toward regionalization of neonatal surgical care. *J Pediatr Surg*. 2014;49(10):1475-1479. doi:10.1016/j.jpedsurg.2014.03.002

Boo YJ, Lee EH, Lee JS. Comparison of surgical outcomes among infants in neonatal intensive care units treated by pediatric surgeons versus general surgeons: The need for pediatric surgery specialists. *J Pediatr Surg*. 2017;52(11):1715-1717. doi:10.1016/j.jpedsurg.2017.01.055

Fullerton BS, Sparks EA, Morrow KA, et al. Hospital transfers and patterns of mortality in very low birth weight neonates with surgical necrotizing enterocolitis. *J Pediatr Surg*. 2016;51(6):932-935. doi:10.1016/j.jpedsurg.2016.02.051

Kastenberg ZJ, Lee HC, Profit J, Gould JB, Sylvester KG. Effect of deregionalized care on mortality in very low-birth-weight infants with necrotizing enterocolitis. *JAMA Pediatr*. 2015;169(1):26-32. doi:10.1001/jamapediatrics.2014.2085

Lasswell SM, Barfield WD, Rochat RW, Blackmon L. Perinatal regionalization for very low-birth-weight and very preterm infants: A meta-analysis. *JAMA*. 2010;304(9):992-1000. doi:10.1001/jama.2010.1226

3.2 Pediatric Intensive Care Unit (PICU)

Rationale

Pediatric intensive care is essential to care for children who need comprehensive or advanced surgical care. Moreover, there are situations when the need for critical care services may occur unexpectedly. Therefore, Level I and Level II centers must have pediatric intensive care units to care for children with surgical diseases. 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 will include infants and children who need critical care. Therefore, appropriate intensive care units for the range of ages of children cared for at the institution must be continuously available.

Definition and Requirements

All Levels

- Response times for patients with emergency needs in the PICU must be monitored by the PIPS program.

Level I

- A children's surgical center must have a quaternary pediatric intensive care unit as delineated in current American Academy of Pediatrics and Pediatric Critical Care Medicine recommendations.

Level I Specialty Musculoskeletal and Level I Specialty Oncology

- A children's surgical center must have a tertiary (with specialties within scope of service required) or higher pediatric intensive care unit, as delineated in current American Academy of Pediatrics and Pediatric Critical Care Medicine recommendations.

Level II

- A children's surgical center must have a tertiary-based PICU or higher, as delineated in current American Academy of Pediatrics and Pediatric Critical Care Medicine recommendations.

Level III

- A children's surgical center must have the capability to stabilize, support, and safely transfer critically ill infants and children with surgical needs who may be seen within the institutional scope of service.

See Standard 4.6 PICU Personnel for more details.

Documentation

- Delineation of the surgical services provided by the PICU should be detailed in the PRQ.
- Describe the facilities and resources adequately to support the PICU status proposed.

Resources

Frankel LR, Hsu BS, Yeh TS, et al. Criteria for Critical Care Infants and Children: PICU Admission, Discharge, and Triage Practice Statement and Levels of Care Guidance. *Pediatr Crit Care Med*. 2019;20(9):847-887.

Hsu BS, Hill V, Frankel LR, et al. Executive Summary: Criteria for Critical Care of Infants and Children: PICU Admission, Discharge, and Triage Practice Statement and Levels of Care Guidance. *Pediatrics*. 2019;144(4):e20192433.

3.3 Emergency Department Facilities

Rationale

An emergency department with specific equipment and resources to care for all ages of children with urgent and emergent surgical conditions is an important component of a children's surgical center.

Definition and Requirements

Level I

- Children's surgical center must have a designated pediatric-ready emergency department.

Level I Specialty Musculoskeletal and Level I Specialty Oncology

- Specialty hospitals are not required to have emergency department facilities but must have a demonstrable follow-up plan for discharged patients, including for emergency care.

Level II and Level III

- Children's surgical center must have 24/7 pediatric emergency department facilities and emergency medicine capability, including age- and size-appropriate equipment, to care for children with surgical needs within the scope of practice.

Level II (Neonatal Only)

- Children's surgical center that limits the scope of practice to neonatal patients is 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.

Documentation

- Provide emergency department details in the PRQ.
- Provide emergency follow-up plan for Specialty Hospitals.

Resources

Ames SG, Davis BS, Marin JR, L. Fink EL, Olson LM, Gausche-Hill M, Kahn JM. Emergency Department Pediatric Readiness and Mortality in Critically Ill Children. *Pediatrics*. 2019;144(3):e20190568.

Gausche-Hill M, Ely M, Schmuhl P, et al. A national assessment of pediatric readiness of emergency departments. *JAMA Pediatr*. 2015;169(6):527-535.

Guidelines for Care of Children in the Emergency Department. Available at: https://www.aap.org/en-us/Documents/Checklist-Guidelines_for_Care_of_Children.pdf. Accessed April 9, 2021.

Pediatric Readiness Toolkit. Available at: <https://emscimprovement.center/domains/hospital-based-care/pediatric-readiness-project/readiness-toolkit/>. Accessed April 9, 2021.

Remick K, Gaines B, Ely M, Richards R, Fendya D, Edgerton EA. Pediatric emergency department readiness among US trauma hospitals. *J Trauma Acute Care Surg*. 2019;86(5):803-809.

Remick K, Gausche-Hill M, Joseph MM, et al. Pediatric readiness in the emergency department. *Pediatrics*. 2018;142(5):e20182459.

Remick K, Kaji AH, Olson L, et al. Pediatric readiness and facility verification. *Ann Emerg Med*. 2016 Mar;67(3):320-328.e1. doi: 10.1016/j.annemergmed.2015.07.500. Epub 2015 Aug 29.

Standards of Care for Children in Emergency Departments. Available at: <https://www.ifem.cc/wp-content/uploads/2019/06/Standards-of-Care-for-Children-in-Emergency-Departments-V3-2019.pdf>. Accessed April 9, 2021.

3.4 Preoperative Facilities

Rationale

Dedicated preoperative preparation of children about to undergo surgery is an essential component of providing high-quality contemporary children's surgical care.

Definition and Requirements

All Levels

- The preoperative preparation of children must occur in an area appropriate for pediatric patients.
- The preoperative preparation of children must be separate from adult patients and appropriate for pediatric patients.
- After-hours capability is required, understanding that intra-facility processes and geography may be different after hours.

See Standard 2.5 Ambulatory Surgery Patients and Ambulatory Surgical Center for further details.

Documentation

- The presence of a children's preoperative care area should be indicated on the PRQ.
- Children's preoperative processes should be detailed, and pediatric equipment summarized.
- Facility tour at site visit.

Resources

American Academy of Pediatrics. Preoperative Assessment. In: McInerney TK, Adam HM, Campbell DE, DeWitt TG, Foy JM, Kamat DM, eds. *American Academy of Pediatrics Textbook of Pediatric Care, 2nd Edition*. American Academy of Pediatrics; 2017; Chapter 63: Preoperative Assessment. Sarah Tariq, MD; Jayant K. Deshpande, MD.

Section on Anesthesiology and Pain Medicine, Polaner DM, Houck CS; American Academy of Pediatrics. Critical Elements for the Pediatric Perioperative Anesthesia Environment. *Pediatrics*. 2015;136(6):1200-1205. doi:10.1542/peds.2015-3595

3.5 Operating Room Facilities

Rationale

An operating room environment that has appropriate pediatric equipment and supplies is an essential part of a children's surgical center. The ready availability of an operating room environment for children must be continuously monitored by the PI process. The operating room environment will include designated space for formal operating rooms but may include an operating room environment at the bedside in the NICU, PICU, OR, ER, cath lab, IR suite, or other location.

Definition and Requirements

All Levels

- A designated children's OR must be readily available 24/7 within 60 minutes.
- Children's surgical centers must have age- and size-appropriate OR equipment for the patient populations they serve. 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.
- 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 operating rooms (ORs) and recovery areas. See Standard 2.5 Ambulatory Surgery Patients and Ambulatory Surgical Center for further details.

Level I, Level I Specialty Musculoskeletal, and Level I Specialty Oncology

- In the circumstance that an urgent case presents, and the children's OR is busy, there must be capacity to start a back-up children's OR within 60 minutes, 24/7.

Documentation

- The operating room environment, including equipment and supplies, must be described in the PRQ.

Resource

Section on Anesthesiology and Pain Medicine, Polaner DM, Houck CS; American Academy of Pediatrics. Critical Elements for the Pediatric Perioperative Anesthesia Environment. *Pediatrics*. 2015;136(6):1200-1205. doi:10.1542/peds.2015-3595

3.6 Pediatric Post-Anesthesia Care Unit (PACU)

Rationale

A designated post-anesthesia care unit or other unit with a similar functional capacity must be available 24/7 to care for post-surgical children of all ages.

Definition and Requirements

All Levels

- A designated PACU or other unit with functional capacity must be available 24 hours per day to provide care for the pediatric patient during the recovery phase.
- The postoperative recovery of children must occur in a PACU separate from adult patients and appropriate for pediatric patients.
- After-hours capability is required, understanding that the location may be different after hours; the goal is to make sure that children's interests are preserved by personnel with appropriate training and to preserve some privacy for pediatric patients and their families.
- The PACU or other unit used must have the necessary equipment to monitor and resuscitate pediatric patients within the scope of services offered.

See Standard 2.5 Ambulatory Surgery Patients and Ambulatory Surgical Center for further details.

Documentation

- The presence and availability of a PACU will be documented in the PRQ.

Resources

Section on Anesthesiology and Pain Medicine, Polaner DM, Houck CS; American Academy of Pediatrics. Critical Elements for the Pediatric Perioperative Anesthesia Environment. *Pediatrics*. 2015;136(6):1200-1205. doi:10.1542/peds.2015-3595

Von Ungern-Sternberg BS. Respiratory Complications in the Pediatric Postanesthesia Care Unit. *Anesthesiol Clin*. 2014 March;32:45-61.

3.7 Imaging Facilities

Rationale

Specialized radiology services are critical in the management of infants and children with surgical needs. Off-site image analysis is a permissible adjunct but is not alone sufficient to meet these requirements.

Definition and Requirements

All Levels

- Conventional radiography, ultrasound, fluoroscopy, 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.

Level I, Level I Specialty Musculoskeletal, and Level I Specialty Oncology

- MRI and interventional radiology must be immediately available (within 60 minutes, 24/7).

Documentation

- The availability of radiologic resources will be documented in the PRQ.

Resources

American College of Radiology. Teleradiology. Available at: <https://www.acr.org/Practice-Management-Quality-Informatics/Legal-Practices/Teleradiology>. Accessed April 9, 2021.

Dillman JR, Larson DB. Quality and safety in pediatric radiology. *Pediatr Radiol*. 2019;49(4):431-432. doi:10.1007/s00247-019-04353-0

3.8 Blood Bank and Laboratory Services

Rationale

Any level children's surgery center must have the ability to provide diagnostic laboratory testing and blood bank resources appropriate for their patients.

Definition and Requirements

All Levels

- 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. This would include a massive transfusion protocol in Level I centers. See Standard 5.3 Massive Transfusion Protocol for further details.
 - Laboratory services, including testing of micro samples, must be available. See Standard 4.24 Laboratory Services for further details.
-

Documentation

- Blood banking policies and procedures as they relate specifically to children undergoing surgery, both elective and emergency.

3.9 Extracorporeal Membrane Oxygenation (ECMO)

Rationale

Extracorporeal membrane oxygenation (ECMO) can be a life-saving treatment modality for critically ill infants and children with both medical and surgical diseases. This includes neonatal surgical disease such as congenital diaphragmatic hernia. ECMO may also be used to support pediatric surgical patients after trauma as well as to facilitate management of complex airway and pulmonary conditions.

In general, Level I centers should be able to provide treatment for most complex pediatric conditions. However, there are treatments that are so infrequent and complex that concentration of these patients into fewer centers may improve overall system quality. ECMO is a treatment that may be best concentrated in centers with higher volumes. The CSV Program does not intend to promote the proliferation of low-volume ECMO centers. Therefore, it is not required that a Level I center physically house an ECMO program, but the program must be able to transfer appropriate patients promptly and safely to an ECMO center. These transfers must be supported by written transfer agreements and prospectively defined plans to assure well-coordinated continuity of care.

Definition and Requirements

Level I

- Centers must have either an ECMO program or prospectively defined plans and transfer agreements to facilitate prompt transfer to an ECMO center.
- If there is an ECMO program at the center, surgeons must be a part of the leadership of this program to assure well-coordinated care. Collaborative leadership of the ECMO program, including neonatologists and pediatric intensivists, is encouraged, but surgeons must be actively engaged in quality improvement efforts and protocol development.
- All mortalities of ECMO patients must be reviewed in the PIPS Committee or subcommittee.
- If there is not an ECMO program at the center, the center must have a quality assurance program to assure appropriate identification of ECMO candidates and timely, safe transfer to an ECMO center.

Documentation

- The availability of ECMO services should be described in the PRQ.
- Provide clinical protocols.
- Provide reports from mortality review of ECMO patients.
- Provide reports from quality review of ECMO candidates, ELSO registry report, if available.
- Interview of neonatology and PICU leadership.
- Facility tour at site visit.

Resource

Zakhary B, Shekar K, Diaz R, et al. Position Paper on Global Extracorporeal Membrane Oxygenation Education and Educational Agenda for the Future: A Statement From the Extracorporeal Life Support Organization ECMOed Taskforce. *Crit Care Med.* 2020;48(3):406.

3.10 Telemedicine and Teleconferencing

Rationale

With the improvements in Internet accessibility and the need for the remote provision of telemedicine and teleconferencing, the facility must provide adequate access to these resources now considered essential for quality children's surgical care. This is especially true for patients who may live long distances from specialty pediatric health care.

Definition and Requirements

All Levels

- Adequate Internet access and information technology equipment and administrative support systems must be provided at all levels to enable telemedicine and teleconferencing for surgical patients.
 - Adequate telehealth processes must be in place to support surgical patients.
-

Documentation

- Internet access and telemedicine availability will be documented in the PRQ.
 - Telehealth processes will be described.
-

Resource

Hollander JE, Carr BG. Virtually Perfect? Telemedicine for Covid-19. *N Engl J Med*. April 30, 2020;382:1679-1681.



AMERICAN COLLEGE OF SURGEONS
CHILDREN'S SURGERY VERIFICATION QUALITY IMPROVEMENT PROGRAM

4 Personnel and Services Resources

4.1 Surgeons

Rationale

Having appropriately qualified surgeons readily available for the care of children is foundational. Children's surgery centers therefore must have continuous availability of surgical specialists appropriate to the prospectively defined institutional scope of service. Given the comprehensive nature of Level I centers this requires a wide range of surgical specialists. Level II and Level III centers may require a more limited range of specialties depending on their institutional scope of service. Surgeons must be involved in the preoperative, intraoperative, and postoperative care of their patients. While this care may be facilitated by multidisciplinary teams, these teams do not replace involvement of the surgeon in the care of patients.

Definition and Requirements

For the purpose of definition, **children's surgical specialists** are surgeons who have completed the highest level of training and certification available for children. In many specialties this is defined by an ACGME-approved pediatric fellowship training program and pediatric sub-specialty board certification by the respective ABMS member board. In some surgical specialties, fellowship training programs are well established but are not evaluated by the ACGME or a pediatric sub-specialty ABMS member board certification does not exist. These specialties may have independent boards, or an ABMS Focused Practice Designation (FPD) instead, or pediatric fellowships defined by a specialty society. For the purpose of this program these will be recognized as pediatric sub-specialty certification. Informal fellowships that are not part of a specialty-wide educational paradigm will require individual evaluation.

A surgeon with pediatric expertise is defined as a surgeon either in the examination process or with current certifications from the American Board of Surgery or similar ABMS Board or equivalent. The surgeon will demonstrate continuous experience with children as defined by caring for at least 25 patients \leq 18 years of age per year and completing 12 or more pediatric *AMA PRA Category 1 Credits™* credit hours annually.

All Levels

- All children's surgical specialists and surgeons with pediatric expertise required for the institutional scope of service must be available at bedside 24/7/365 within 60 minutes of request or identified need. In the case of centers with graduate medical education training

programs, the initial response is often a trainee or advanced practice provider (APP), which is appropriate. Trainees and APPs must communicate in a timely fashion with staff, and these attending staff must be available within 60 minutes of an urgent call from a trainee or APP when needed. This may include seeing the patient in the operating room suite for the first time if notified of a surgical emergency.

- All children's surgical specialists and surgeons with pediatric expertise will demonstrate ongoing clinical engagement in children's surgery, as evidenced by the performance of 25 or more procedures annually on patients 18 years or younger. To maintain operative skills, all surgeons who are credentialed must remain actively involved in clinical surgery.
- Children's surgeons must participate in the care of surgical patients specific to their surgical fields.
- The care of infants and children five years of age or younger must be provided by these children's surgical specialists, except as specifically and prospectively delineated by the institution via appropriate credentialing or elsewhere in these standards.
- Surgeons must be physically present for procedures for which they are the primary responsible provider.
- Specifically, delineated call coverage may be provided by physicians or surgeons without pediatric certification or specific pediatric credentials. In this circumstance, there must be a written plan (delineation of privileges) and relevant published back-up call schedules for the provision of pediatric subspecialty care outside of this limited scope of practice. Please see Standards 4.11 and 4.12 for specific requirements.
- Surgeons must have ongoing clinical involvement in all the phases of care of children with surgical problems. This may be completed with other children's surgeons within the same specialty assuring continuity of care. Although multidisciplinary care teams are appropriate, this responsibility cannot be delegated to medical specialists, surgical trainees, or advanced practice providers. Involvement of the attending surgeons must be demonstrable in the medical record. Important phases of care include, but are not limited to:
 - Perioperative care, including planning and implementation of major therapeutic decisions
 - Daily bedside rounds during the perioperative period
 - Periods of physiologic instability
 - Postoperative complications

The children's surgical specialists available must match the scope of services offered.

Level I Required Surgical Specialists	Level I Specialty Musculoskeletal Required Surgical Specialists	Level I Specialty Oncology Required Surgical Specialists
Pediatric general and thoracic surgery (pediatric surgery)	Pediatric surgery	Pediatric surgery
Pediatric orthopaedic surgery	Pediatric orthopaedic surgery	Pediatric orthopaedic surgery
Pediatric neurosurgery**	Pediatric neurosurgery**	Pediatric neurosurgery**
Congenital heart surgery*	Pediatric urology	Pediatric plastic surgery
Pediatric plastic surgery		Pediatric ophthalmology
Pediatric ophthalmology		Pediatric otolaryngology
Pediatric otolaryngology		Pediatric urology
Pediatric urology		

*Congenital heart surgery services may be provided through transfer agreements

** Please review Appendix IV for pediatric neurosurgery call coverage.

Level II and Level III

- In Level II centers there may be a limited scope of services as prospectively defined but must include pediatric general and thoracic surgery.
- In Level III centers, the scope of services must be prospectively defined, and care may be provided by surgeons with pediatric expertise.

Requirements for Pediatric Surgeons

Level I, Level I Specialty Musculoskeletal, Level I Specialty Oncology, and Level II

- In order to assure 24/7/365 availability, Level I and Level II centers must have two or more pediatric general and thoracic surgeons on the medical staff.
- Lower volume Level II centers may not have two full-time equivalents but must have two or more surgeons with medical staff privileges to assure continuous coverage.
- See Standard 4.12 Call Coverage regarding call coverage requirements for Pediatric Surgeons.
- See Standard 4.13 Continuing Medical Education for requirements.

Documentation

- Centers must provide their hospital policies regarding surgeon credentialing, availability, and participation in daily care of surgical patients.
- Privileging documents for surgeons will be reviewed onsite.

- PRQ Surgeon table must be completed.
- Chart review will be conducted onsite to ensure compliance with the above standards.
- Individuals with equivalent training will submit CV and appropriate supporting documentation with PRQ.
- Surgeons with pediatric expertise will provide relevant supporting data to fulfill case volume and CME requirements.
- If call coverage includes non-pediatric providers, these providers will be reviewed, as well as back-up call schedules at site visit.

Resources

American College of Surgeons Children's Surgery Verification Quality Improvement Program. *Optimal Resources for Children's Surgical Care v.1*. Available at: <https://www.facs.org/quality-programs/childrens-surgery/childrens-surgery-verification/standards>. Accessed April 13, 2021.

Referral to pediatric surgical specialists. *Pediatrics*. Feb 2014;133(2):350-356. DOI: 10.1542/peds.2013-3820

Tejwani R, Wang HS, Young BJ, et al. Increased pediatric sub-specialization is associated with decreased surgical complication rates for inpatient pediatric urology procedures. *J Pediatr Urol*. 2016;12(6):388.e1-388.e7. doi:10.1016/j.jpuro.2016.05.034

Vonlanthen R, et al. Toward a Consensus on Centralization in Surgery. *Ann Surg*. Nov 2018;268(5):712-724.

4.2 Anesthesia Services

Rationale

Having appropriately qualified pediatric anesthesiologists readily available for the care of infants and young children is essential. Available data emphasize the critical role of specialty trained pediatric anesthesiology providers for infants and young children undergoing surgery. For several decades, it has been apparent that the highest perioperative risk for anesthesia is in neonates and infants, and this risk can be diminished by the deployment of individuals with the unique skills acquired in pediatric anesthesiology specialty training.

Definition and Requirements

A *pediatric anesthesiologist* is defined as an individual certified in pediatric anesthesiology or in the examination process for a certificate of added qualifications in pediatric anesthesiology by the American Board of Anesthesiology or equivalent body, or who is similarly qualified by demonstrable experience and training via the *Pediatric Anesthesia Alternative Pathway* delineated in this document (Appendix II). Certifying bodies in the United Kingdom (the Royal College of Anaesthetists) and Canada (Royal College of Physicians and Surgeons of Canada) are considered *equivalent* to the American Board of Anesthesiology.

An *anesthesiologist with pediatric expertise* is defined as an anesthesia provider either in the examination process to certify or with current certification from the American Board of Anesthesiology or equivalent. This provider will demonstrate continuous experience with children ≤ 24 months of age, defined as at least 25 patients per anesthesia provider per year. In addition, this individual will demonstrate ongoing pediatric clinical engagement in patients ≤ 18 years of age and complete 12 or more pediatric *AMA PRA Category 1 Credits™* credit hours annually.

Level I

- Two or more pediatric anesthesiologists must be on the medical staff. Call schedules must be available to confirm 24/7/365 pediatric coverage.
- A pediatric anesthesiologist *must* serve as the primary anesthesiologist for children 24 months or younger and *should* serve as primary anesthesiologist for children ≤ five years of age or with ASA 3 or higher.

- Anesthesiologists must be physically present for procedures for which they are the primary responsible provider. When an attending anesthesiologist is “physically present” for a procedure, the provider must be onsite, immediately available to respond to OR events and serve as the anesthesiologist of record for the patient. Institutions must have written policies that define the critical portions of procedural anesthetics that require the attending anesthesiologist’s presence (for example, induction, emergence, and so on).
- Pediatric anesthesia services must be immediately available on-site 24 hours a day. Providers utilized to meet this requirement must be credentialed by their institution to initiate surgical anesthesia independently in emergent situations in consultation with the on-call pediatric anesthesiologists. Local criteria must be established to define conditions requiring the attending pediatric anesthesiologist’s physical presence, and the PIPS program must verify compliance.

Level I Specialty Musculoskeletal, Level I Specialty Oncology, and Level II

- Children’s surgical center must have two or more pediatric anesthesiologists on the medical staff. Call schedules must be available to confirm 24/7/365 pediatric coverage.
- A pediatric anesthesiologist must be available 24 hours a day to respond within 60 minutes to the bedside.
- The pediatric anesthesiologist serving on the children’s surgical medical staff must serve as the primary pediatric anesthesiologist for all children 24 months or younger and should serve as primary anesthesiologist for children ≤ five years of age or with ASA 3 or higher.
- Anesthesiologists must be physically present for procedures for which they are the primary responsible provider. When an attending anesthesiologist is “physically present” for a procedure, the provider must be onsite, immediately available to respond to OR events, and serve as the anesthesiologist of record for the patient. Institutions must have written policies that define the critical portions of procedural anesthetics that require the attending anesthesiologist’s presence (for example, induction, emergence, and so on).
- 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.

Level III

- Anesthesia providers with pediatric expertise must be on the medical staff, and one of them must serve as an anesthesia provider for all children 24 months or younger and should serve as primary anesthesiologist for children \leq five years of age or with ASA 3 or higher.
- Anesthesia providers with pediatric expertise must be promptly available 24 hours a day to respond to the bedside within 60 minutes.
- The Medical Director of Children's Anesthesia (MDCA) must be an anesthesiologist with pediatric expertise.

Anesthesia providers with pediatric expertise on staff will demonstrate ongoing pediatric clinical engagement by caring for a minimum of 25 patients per year less than 24 months of age and will complete 12 or more pediatric *AMA PRA Category 1 Credits™* credit hours annually.

- Under the circumstance when the anesthesia provider takes call from out of the hospital, 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 onsite 24/7.
- If an emergency exists and a pediatric anesthesiologist is required, the center must be able to provide emergency stabilization and promptly and safely transfer the child to a center with the capability of providing the resources the patient needs. These transfers must be supported by written transfer agreements and prospectively defined plans to assure well-coordinated continuity of care.

Documentation

- Institutions must complete the PRQ Anesthesiologist table.
- Institutions must provide a call schedule to confirm 24/7 pediatric anesthesiology coverage.
- Institutions must provide privileging documentation.
- Upload written plan/policies detailing the scope of service with clear delineation of circumstances requiring call-in of pediatric specialty anesthesia providers and provision of emergency care.
- Upload privileging documents for any anesthesia provider credentialed to start a case requiring general anesthesia in infants or children.
- Provide a relevant published call schedule for pediatric anesthesia coverage.
- Individuals with equivalent training will submit CV and appropriate supporting documentation with PRQ.

- If any individuals are to be considered via alternative pathway, CV and alternative pathway supporting documents must be submitted.
- Anesthesia providers with pediatric expertise will provide relevant supporting data to fulfill case volume and CME requirements.
- Anesthesia requirements will be reviewed through the on-site chart review.

Resources

Bhananker SM, Ramamoorthy C, Geiduschek JM, et al. Anesthesia-related cardiac arrest in children: Update from the Pediatric Perioperative Cardiac Arrest Registry. *Anesth Analg*. 2007;105:344-350.

Christensen RE, Lee AC, Gowen MS, et al. Pediatric Perioperative Cardiac Arrest, Death in the Off Hours: A Report From Wake Up Safe, The Pediatric Quality Improvement Initiative. *Anesth Analg*. 2018;127:472-477.

Polaner DM, Houck CS. Critical elements for the pediatric perioperative anesthesia environment. *Pediatrics*. 2015;135(6):1200-1205.

Muffly MK, Honkanen A, Scheinker D, Wang TNY, Saynina O, Singleton M, Wang CJ, Sanders L. Hospitalization patterns for inpatient pediatric surgery and procedures in California: 2000-2016. *Anesth Analg*. 2020 Oct;131(4):1070-1079.

Muffly MK, Scheinker D, Muffly TM, Singleton M, Agarwal R, Honkanen A. Practice characteristics of Board-certified Pediatric Anesthesiologists in the US: A Nationwide Survey. *Cureus*. 2019 Sep 24;11(9):e5745.

Muffly MK, Singleton M, Agarwal R, Scheinker D, Miller D, Muffly TM, Honkanen A. The pediatric anesthesiology workforce: Projecting supply and trends 2015-2035. *Anesth Analg*. 2018 Feb;126(2):568-578.

4.3 Medical Specialists

Rationale

Children's surgery centers require the continuous availability of medical specialists appropriate to the prospectively defined institutional scope of service offered, to ensure appropriate coverage for children with surgical needs. While the range of required specialists will vary by program level, all institutions must ensure that required specialists are responding to the bedside within 60 minutes of an identified urgent need, 24/7/365.

Definition and Requirements

Pediatric specialists must be available to bedside within 60 minutes when requested. These specialists must be readily available 24/7/365, as delineated prospectively within internally published call schedules. The intent is to ensure that the care team for a child with a surgical problem has ready access to a comprehensive panel of providers with the highest level of pediatric training. These pediatric medical specialists must be ABMS Board certified or in the process of becoming certified, or equivalent, and have completed an appropriate pediatric fellowship, ACGME approved or equivalent. See Standard 4.13 for Continuing Medical Education requirements.

The care of infants and children five years of age or younger must be provided by these specialists, except as specifically and prospectively delineated by the institution or elsewhere in these standards.

For the purpose of definition, children's medical specialists are providers who have completed the highest level of pediatric training and certification available. In many specialties this is an ACGME-approved pediatric fellowship training program and pediatric sub-specialty board certification by the respective ABMS member board. In some specialties, fellowship training programs are well established but are not evaluated by the ACGME or a pediatric sub-specialty ABMS member board certification does not exist. These specialties may have independent boards or an ABMS Focused Practice Designation (FPD) instead, or pediatric fellowships defined by specialty society. For the purpose of this program these will be recognized as pediatric sub-specialty certification. Informal fellowships that are not part of a specialty-wide educational paradigm will require individual evaluation.

All Levels

- Pediatric medical specialists must be available at bedside 24/7/365 within 60 minutes of identified urgent need.
- Geneticists and rheumatologists are not required to be at the bedside within 60 minutes 24/7/365, as there is not recognized need for this within the specialty.

Timeliness Requirements for All Levels

- Centers must ensure timely presence of appropriate pediatric medical at the bedside when need is identified. The requirement is response within 60 minutes 24/7/365 for identified need. Need may be identified by other providers, nurses, or any member of the care team. Time of initiating emergent calls must be documented. In the case of centers with graduate medical education training programs, the initial response is often a trainee or advanced practice provider (APP), which is appropriate. Trainees and APPs must communicate in a timely fashion with staff and these attending staff must be available within 60 minutes of an urgent call from a trainee or APP when needed. This may include seeing the patient in the operating room suite for the first time if notified of a surgical emergency.

Level I Required Pediatric Medical Specialists	Level I Specialty Musculoskeletal Required Pediatric Medical Specialists	Level I Specialty Oncology Required Pediatric Medical Specialists
Cardiology	Cardiology	Cardiology
Endocrinology	Endocrinology	Endocrinology
Gastroenterology	Gastroenterology	Gastroenterology
Genetics	Genetics	Genetics
Hematology/oncology	Hematology/oncology	Hematology/oncology
Infectious disease	Infectious disease	Infectious disease
Nephrology	Nephrology	Nephrology
Neurology	Neurology	Neurology
Pulmonary medicine	Pulmonary medicine	Pulmonary medicine
Rheumatology	Physical medicine and rehabilitation	Radiation oncology
	Rheumatology	

Level I, Level I Specialty Musculoskeletal, and Level I Specialty Oncology

Children’s medical specialists must be available in a timely manner to support a comprehensive scope of institutional practice in infants and children with surgical problems. Specifically, this includes the pediatric specialists listed in the table above.

Level II

Level II centers must provide prompt and readily available access to a full range of pediatric medical specialists consistent with scope of institutional surgical practice. Specifically, this includes the following pediatric specialists:

- Cardiology
- Gastroenterology
- Hematology/oncology
- Infectious disease
- Neurology
- Other pediatric specialties not listed must be available if within the scope of service

Documentation

- Provide the PRQ Medical Staff table (with evidence of ABMS Board certification status and pediatric fellowship training).
- Delineation of privileges (institutional credentials) reviewed at site visit.
- If call coverage includes non-pediatric providers, written scope of practice documents for these providers will be reviewed, as well as back-up pediatric call schedules at site visit.
- Review of call schedules at site visit.
- Chart reviews, staff interviews regarding timeliness of care and provider availability reviewed at site visit.
- Institutions must provide center policies regarding bedside provider presence, which will also be reviewed at the site visit.

Resources

American College of Surgeons Children’s Surgery Verification Quality Improvement Program. *Optimal Resources for Children’s Surgical Care v.1*. Available at: <https://www.facs.org/quality-programs/childrens-surgery/childrens-surgery-verification/standards>. Accessed April 13, 2021.

Goldstein SD, et al. The “Weekend Effect” in Pediatric Surgery – Increased Mortality for Children Undergoing Urgent Surgery During the Weekend. *J Pediatr Surg*. Jan 2014;49(7):1087-1091. <https://www.sciencedirect.com/science/article/pii/S0022346814000050?via%3Dihub>

Johnston KJ, et al. Lack of Access to Specialists Associated With Mortality and Preventable Hospitalizations of Rural Medicare Beneficiaries. *Health Affairs*. Dec 2019;38(12):1993-2002. <https://www.healthaffairs.org/doi/10.1377/hlthaff.2019.00838>

Lail J, et al. Quality Improvement Strategies for Population Management of Children With Medical Complexity. *Pediatrics*. Sept 2017;140(3):e20170484. <https://pediatrics.aappublications.org/content/140/3/e20170484>

Levels of Neonatal Care. Committee on Fetus and Newborn. *Pediatrics*. September 2012;130(3):587-597. <https://pediatrics.aappublications.org/content/130/3/587.short>

McAteer JP, et al. Pediatric Specialist Care is Associated with a Lower Risk of Bowel Resection in Children with Intussusception: A Population-Based Analysis. *JACS*. Aug 2013;217(2):226-232. <https://www.sciencedirect.com/science/article/pii/S1072751513002391?via%3Dihub>

4.4 General Pediatricians and Hospitalists

Rationale

The primary care provider (PCP) for a child or adolescent plays a critical role in the patient's life. The primary care provider may provide information about the patient's history, manage long-term problems, intervene with acute changes in health, and meet the family's psychosocial health needs. Primary care providers often provide continuity of care for children with surgical problems throughout the patient's course, including during the post-surgical recovery period. The immediate presence of the primary care provider may not be required at all stages of care for surgical patients, but communication with the PCP is always encouraged.

When a surgeon has assumed responsibility for an infant or child with a surgical problem in a Level I, II, or III children's surgical center, the surgeon should recognize the importance of a general pediatric medical perspective. The patient's PCP or a pediatrician in another role, such as a pediatric hospitalist, may provide this perspective. Pediatric hospitalists have become important members of the acute care team in many institutions and may function as consultants in the traditional sense or offer active co-management of children with surgical problems. Some pediatric centers involve hospitalists or other pediatricians with experience in caring for medically complex children preoperatively. Pediatric hospitalists may also be in-house members of the Rapid Response Team. The American Academy of Pediatrics has indicated that children less than 40 kg or 14 years of age may benefit from pediatric consultation if the surgical team does not routinely care for children. If patients with surgical problems are admitted to a general or subspecialty pediatric medical service, the surgical service should be consulted and actively involved in the patient's care. Pediatric hospitalists may be important resources in the establishment of postoperative care pathways such as enhanced recovery after surgery.

Definition and Requirements

All Levels

A general pediatrician or pediatric hospitalist must be on staff and readily available (within 60 minutes 24/7/365) if perioperative acute hospital care beyond the NICU or PICU is within the institutional scope of service.

Documentation

- Provide the PRQ Medical Staff table (with evidence of ABMS Board certification status and pediatric fellowship training).
- Describe how pediatric hospitalists and/or general pediatricians are involved in the care of hospitalized surgical patients.

Resources

Lye PS; American Academy of Pediatrics. Committee on Hospital Care and Section on Hospital Medicine. Clinical report—physicians' roles in coordinating care of hospitalized children. *Pediatrics*. 2010 Oct;126(4):829-832. doi: 10.1542/peds.2010-1535. Epub 2010 Sep 6. PMID: 20819897.

Rappaport DI, Rosenberg RE, Shaughnessy EE, Schaffzin JK, O'Connor KM, Melwani A, McLeod LM. Pediatric hospitalist comanagement of surgical patients: structural, quality, and financial considerations. *J Hosp Med*. 2014 Nov;9(11):737-742. doi: 10.1002/jhm.2266. Epub 2014 Oct 6. PMID: 25283766.

4.5 NICU Personnel

Rationale

Newborn infants present with unique surgical and medical challenges. Multidisciplinary care of these complex patients is typical. Level I and Level II children's surgery centers that routinely care for these infants require neonatology, the associated medical and surgical specialties, and appropriate nonphysician personnel. These associated specialties are defined in the current American Academy Pediatrics (AAP) NICU resource guide.

Neonatologists direct the neonatal ICU medical team; neonatal nurse practitioners are often part of this team, and children's surgeons are essential as well. Collaborative leadership between neonatology and surgery is essential for safe patient care of surgical patients and productive quality improvement. While the structure of these leadership teams may vary between centers, the essential functions for collaboration are needed in all NICUs caring for surgical patients. While Level III children's surgical centers infrequently provide surgery for neonates, they need to have the ability to stabilize a newborn for transfer to another center.

Definition and Requirements

A neonatologist is defined as an individual who is either in the process of board certification or certified by the American Board of Pediatrics in neonatal-perinatal medicine or equivalent.

Neonatologists appropriately trained in and who hold privileges for deep sedation in children may provide procedural sedation for neonates undergoing non-surgical procedures. In different institutions, procedural sedation is done by pediatric critical care, pediatric emergency medicine, or pediatric hospital medicine as well as neonatology or anesthesiology. The chief of anesthesiology, or their appointed chair/chief of anesthesia for the NICU acting on behalf of the chief of anesthesiology, must have oversight responsibility for all procedural sedation in the NICU.

In the circumstance that major operative procedures requiring general anesthesia are performed at bedside in the NICU, the center must have written policies to ensure that all staff and providers (including anesthesia providers) have training, experience and competencies equivalent to those required in the OR environment itself. Safety processes (for example, Timeouts) for bedside procedures must be similar to the processes required for procedures performed in the operating room as well.

Level I and Level II

- Level I and II centers must maintain appropriate neonatal critical care services with surgical leadership formally participating in their operational management.
- In-house neonatology services must be available 24/7/365. An in-house provider may be a neonatologist, a neonatology fellow or neonatal nurse practitioner. If a neonatologist is not in-house, there must be a neonatologist on call who is able to respond within 60 minutes. If the neonatologist is covering multiple sites, a back-up schedule is required. The institution must define requirements for bedside physical presence for neonatologists and surgeons, and the PIPS process must review compliance for surgical patients who experience major events and/or physiologic instability.
- Centers must provide prompt and readily available access to a full range of pediatric medical and surgical subspecialists as required based on the current AAP NICU Guidelines.
- Centers must provide nonphysician personnel with neonatal experience and training consistent with the current AAP NICU Guidelines.
- Surgeons must provide demonstrable collaborative leadership in patient safety and quality improvement efforts in the NICU. This must include an identifiable surgeon or group of surgeons who participate in these leadership activities.
- Surgeons must demonstrate ongoing collaborative care and communication with the multidisciplinary team for neonates with active surgical needs, as evidenced in the medical record.
- Communication systems and process must be in place to facilitate timely communication between medical and surgical teams.
- There must be a children's surgeon who serves within the medical leadership structure of the NICU (who may be designated as the "surgical director") and is responsible for setting policies and defining administrative needs related to NICU patients with surgical needs.
- It is not required that Level I Specialty Musculoskeletal and Oncology Centers will have a neonatal intensive care unit (NICU), or neonatal critical care services.

Level III

- A pediatrician with expertise in the resuscitation and stabilization of neonates must be on call and available within 60 minutes 24/7/365.
- Level III centers must be able to stabilize and transfer newborns with surgical problems to higher level centers.

Non-Physician Personnel

Centers providing neonatal surgical care must ensure that the highest level of neonatal expertise in all disciplines is available (24/7/365). Because there are not uniform national standards (such as ACGME fellowships or boards) in all disciplines, this standard requires that each institution have prospectively established training and competency requirements specific for neonates. These must include onboarding and ongoing assessment to ensure acquisition and maintenance of appropriate skills and competencies. Personnel in the following disciplines who care for patients in the NICU are included in this requirement:

- Nursing
- Pharmacy
- Respiratory therapy
- Social services

Documentation

- Provide call schedules that demonstrate 24/7/365 physician and specialty surgeon coverage of neonatal surgical patients.
- Provide quality improvement activities portfolio.
- Provide CV and job description of Surgeon NICU Leader.
- Provide documentation of active participation by surgeon leader in meeting minutes, policy and/ or QI project development.
- Provide policies and curriculum summary for onboarding, ongoing education, and maintenance of competencies for nursing, pharmacy, respiratory therapy, and social services personnel in the NICU.
- Provide relevant written center guidelines for major surgical procedures performed in NICU.
- Describe the character of the procedures and provide the approximate annual number of these operative procedures performed in the NICU.
- Describe the training, experience, and competencies of each of the operating team members for these NICU operative procedures.
- For site visit, have charts available from the most recent five such patients with NICU operations.

Resource

Levels of Neonatal Care. Committee on Fetus and Newborn. *Pediatrics*. September 2012;130(3):587-597. Available at: <https://pediatrics.aappublications.org/content/130/3/587>. short. Accessed April 14, 2021.

4.6 PICU Personnel

Rationale

Care of critically ill children requires a multidisciplinary team with training and experience in caring for the unique needs of these patients. Often the patients are cared for in collaborative fashion by children's surgeons and pediatric intensivists. Patient care in the PICU is also dependent upon specialty trained nurses, respiratory therapists, and other non-physician personnel. The qualifications of these providers are described in the respective sections. Level I centers must have a PICU due to their comprehensive nature. In contrast, a PICU is not required at a Level II center if the scope of surgical service is limited to neonatal patients, but it is required if relevant patients are within scope of service. The facilities and equipment expectations for Level I and II centers are described in Chapter 3. Personnel expectations are similar for all PICUs regardless of center level. Level III centers are not required to have PICU services.

Definition and Requirements

Children's surgical center must maintain appropriate pediatric critical care services with surgical leadership formally participating in their operational management.

Individuals certified in or in the process of certification for critical-care medicine by the American Board of Pediatrics, the American Board of Anesthesiology, the American Board of Surgery, or equivalent organization may be used to meet the pediatric intensivist standard.

Physicians appropriately trained in and who hold privileges for deep sedation in children may provide procedural sedation for children undergoing non-surgical procedures. In different institutions, procedural sedation is done by pediatric critical care, pediatric emergency medicine, pediatric hospital medicine or pediatric anesthesia. The chief of anesthesiology, or their appointed chair/chief of anesthesia for the PICU acting on behalf of the chief of anesthesiology, must have oversight responsibility for all procedural sedation in the PICU.

In the circumstance that major operative procedures requiring general anesthesia are performed at bedside in the PICU, the center must have written policies to ensure that all staff and providers (including anesthesia providers) have training, experience, and competencies equivalent to those required in the OR environment itself. Safety processes (for example, Timeouts) for bedside procedures must be similar to the processes required for procedures performed in the operating room as well.

Level I

- Centers must have a PICU which meets the resource requirements of a quaternary PICU as defined in the current American Academy of Pediatrics (AAP) PICU Levels of Care guidance created in collaboration with the Society for Critical Care Medicine (SCCM). This PICU must have bedside pediatric intensivist attending availability within 60 minutes and collaborative care 24/7/365. While a pediatric intensivist physician is not required in house, there must be continuous staffing that may be by a board-certified intensivist or equivalent provider, or critical care fellow, dedicated to the PICU. The institution must define requirements for bedside physical presence for intensivists and surgeons, and the PIPS process must monitor compliance for surgical patients with major events and/or physiologic instability.
- A qualified medical provider (in quaternary facility PICUs, the qualified medical provider should be a critical care specialist) who is able to respond within five minutes to all emergent patient issues (for example, airway management or cardiopulmonary resuscitation) is necessary for optimal patient outcomes in all levels of PICU. Specialized or quaternary facility PICUs have a minimum requirement of an in-house critical care fellow.
- Children's surgical centers with a PICU must have respiratory therapists, nurses, pharmacists, and others with demonstrable pediatric specific training and experience available 24/7/365.
- Surgeons must provide demonstrable collaborative leadership in patient safety and quality improvement efforts in the PICU. This must include an identifiable surgeon or group of surgeons who participate in these leadership activities.
- Surgeons must demonstrate ongoing collaborative care and communication with a multidisciplinary team for patients with active surgical needs, as evidenced in the medical record.
- Communication systems and processes must be in place to facilitate timely communication between medical and surgical teams.
- 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.

Level I Specialty Musculoskeletal, and Level I Specialty Oncology

- Centers must have a PICU which meets the resource requirements of a tertiary (with specialties within scope of service required), or higher, PICU as defined in the current American Academy of Pediatrics (AAP) PICU Levels of Care Guidance created in collaboration with the Society for Critical Care Medicine (SCCM). This PICU must have bedside pediatric intensivist attending availability within 60 minutes and collaborative care 24/7/365. While a pediatric intensivist physician is not required in house, there must be continuous staffing that may be by a board-certified intensivist or equivalent provider, critical care fellow, or advanced practice provider (APP) dedicated to the PICU. The institution must define requirements for bedside physical presence for intensivists and surgeons, and the PIPS process must monitor compliance for surgical patients with major events and/or physiologic instability.
- A qualified medical provider who is able to respond within five minutes to all emergent patient issues (for example, airway management or cardiopulmonary resuscitation) is necessary for optimal patient outcomes in all levels of PICU.
- Children's surgical centers with a PICU must have respiratory therapists, nurses, pharmacists and others with demonstrable pediatric specific training and experience available 24/7/365.
- Surgeons must provide demonstrable collaborative leadership in patient safety and quality improvement efforts in the PICU. This must include an identifiable surgeon or group of surgeons who participate in these leadership activities.
- Surgeons must demonstrate ongoing collaborative care and communication with a multidisciplinary team for patients with active surgical needs, as evidenced in the medical record.
- Communication systems and processes must be in place to facilitate timely communication between medical and surgical teams.
- 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.

Level II

- Level II centers that provide surgical care for children beyond the neonatal period must have pediatric intensive care services.
- A Level II PICU can be a combined adult and pediatric unit (does not have to be a separate physical facility) but must meet the resource requirements of a tertiary PICU or higher as defined in the current American Academy of Pediatrics (AAP) PICU Levels of Care Guidance created in collaboration with the Society for Critical Care Medicine (SCCM).
- Centers with a PICU must have bedside pediatric intensivist availability within 60 minutes and collaborative care 24/7/365. While a pediatric intensivist physician is not required in house, there must be continuous staffing that may be by a board-certified intensivist or equivalent provider, critical care fellow, or advanced practice provider (APP) dedicated to the PICU. The institution must define requirements for bedside physical presence for intensivists and surgeons, and the PIPS process must monitor compliance for surgical patients with major events and/or physiologic instability.
- A qualified medical provider who is able to respond within five minutes to all emergent patient issues (for example, airway management or cardiopulmonary resuscitation) is necessary for optimal patient outcomes in all levels of PICU.
- Surgeons must demonstrate ongoing collaborative care and communication with a multidisciplinary team for patients with active surgical needs, as evidenced in the medical record.
- Communication systems and processes must be in place to facilitate timely communication between medical and surgical teams.

Level III

- An intensivist is not required. A pediatrician or emergency physician with expertise in the resuscitation and stabilization of children is required and must be on call and available within 60 minutes 24/7/365.
- Generally, Level III centers transfer most critically ill patients, but when surgical patients are treated locally, there must be documentation of joint medical decision making and a process in place to ensure prompt availability of emergency response to the bedside by an in-house pediatric physician and surgeon coverage 24 hours a day.

Non-Physician Personnel

The intent is to ensure that the highest level of pediatric expertise in all disciplines is available across the institution for infants and children receiving care (24/7/365). Because there are not uniform national standards (such as ACGME fellowships or boards) in all disciplines, this standard requires that each institution have prospectively established training and competency requirements specific for children. These must include onboarding and ongoing assessment to ensure acquisition and maintenance of pediatric skills and competencies. Personnel in the following disciplines who care for pediatric patients in the PICU are included in this requirement:

- Nursing
- Pharmacy
- Respiratory therapy
- Social services

Documentation

- Provide call schedules for PICU providers and personnel.
- Provide quality improvement activities portfolio related to PICU.
- Provide CV and job description of Surgeon PICU Leader.
- Provide documentation of active participation by surgeon leader in meeting minutes, policy and/ or QI project development.
- Provide policies and curriculum summary for onboarding, ongoing education and maintenance of competencies for nursing, pharmacy, respiratory therapy and social services personnel in the PICU.

Level I, Level I Specialty Musculoskeletal, and Level I Oncology, and Level II

- Provide relevant written center guidelines for major surgical procedures performed in PICU (under general anesthesia).
- Describe the character of the procedures and provide the approximate annual number of these PICU procedures.
- Describe the training, experience, and competencies of each of the operating team members for these PICU procedures.
- For site visit, have charts available from the most recent five such PICU operative patients.

Resources

Frankel LR, Hsu BS, Yeh TS, et al. Criteria for critical care of infants and children: PICU admission, discharge, and triage practice statement and levels of care guidance. *Pediatr Crit Care Med*. 2019;20(9):847-887.

Hsu BS, Hill V, Frankel LR, et al. Executive Summary: Criteria for Critical Care of Infants and Children: PICU Admission, Discharge, and Triage Practice Statement and Levels of Care Guidance. *Pediatrics*. 2019;144(4):e20192433.

4.7 Imaging Services—Diagnostic Imaging

Rationale

Specialized pediatric radiology services are critical in the management of infants and children with surgical needs. This standard is to ensure that pediatric radiologists are available promptly (24/7/365 within 60 minutes) to provide care in Level I centers. This includes the expectation that critical diagnostic (for example, UGI fluoroscopy for malrotation) or therapeutic studies (for example, intussusception reduction) are performed by individuals with the highest level of pediatric specialty training and experience. This requirement may be met in Level I centers by a combination of pediatric radiologists supplemented by radiologists with pediatric expertise. In case of the latter, non-pediatric specialist providers must have a prospectively defined scope of service (privileges) and relevant pediatric back up coverage and call schedules must be available.

Definition and Requirements

Level I, Level I Specialty Musculoskeletal, and Level I Specialty Oncology

- A pediatric radiologist is defined as an individual currently certified by the American Board of Radiology or equivalent, and with appropriate current pediatric CAQ or equivalent. An individual may also qualify as a pediatric radiologist by demonstrating equivalent training and experience as delineated in the pediatric radiology alternative pathway in Appendix II.
- Two or more pediatric radiologists must be on the medical staff of a Level I children's surgical center. Remote electronic image analysis is a permissible adjunct; however, a pediatric radiologist trained and skilled in hands-on pediatric imaging, such as critical diagnostic or therapeutic fluoroscopy, must always be physically available. Local policy will define prospectively and in writing credentials and need for physical presence for a pediatric radiologist.

Imaging

- Ultrasonography, fluoroscopy, magnetic resonance imaging (MRI), and computed tomography (CT) imaging must be promptly available in a Level I center.
- These imaging modalities must be available within 60 minutes 24/7/365 and a pediatric radiologist should read the related imaging to ensure timely contemporary care at Level I centers for infants and children with surgical needs.
- Appropriate pediatric support personnel must also be available in-house or within 60 minutes on call.

Level II

Definition: A pediatric radiologist is defined as an individual currently certified by the American Board of Radiology or equivalent and with a current pediatric CAQ or equivalent fellowship training. An individual may qualify as a pediatric radiologist by demonstrating equivalent training, or by relevant experience and training as delineated in the pediatric radiology alternative pathway in Appendix II.

The intent is to ensure that an appropriately trained pediatric radiologist is available to provide timely care at the bedside when needed. Timely is defined as within 60 minutes 24/7/365 and appropriate is defined as the ability to perform critical diagnostic and fluoroscopic studies such as UGI for malrotation or intussusception reduction. This availability requirement may be met in Level II centers by a combination of pediatric radiologists supplemented by radiologists with pediatric expertise. In case of the latter, non-pediatric specialist providers must have a prospectively defined scope of service and relevant pediatric back-up coverage and call schedules must be available.

- A Level II children's surgical center must have one or more pediatric radiologists on staff. Remote electronic image analysis is a permissible adjunct; however, a pediatric radiologist must be available for consultation at all times.
- Local policy will define prospectively in writing credentials and need for physical presence for a pediatric radiologist.
- Appropriate pediatric support personnel must also be available in-house or within 60 minutes on call.

Level III

Definition: A radiologist with pediatric expertise is defined as a radiologist with certification by the American Board of Radiology or equivalent and demonstrable ongoing pediatric experience to support the scope of actual practice as well as 12 or more hours of pediatric specific CME annually averaged over three years. Radiologists with pediatric expertise must be on staff and always available to provide care to the bedside. The intent of this standard is to ensure that either a pediatric radiologist or a radiologist with pediatric expertise is promptly available (24/7/365 within 60 minutes) at the bedside when needed, and to ensure that radiologists with pediatric expertise have ongoing personal experience with infants and children consistent with the scope of service. For example, critical diagnostic studies (UGI to rule out malrotation), critical therapeutic studies (intussusception reduction), ultrasound for pyloric stenosis, and emergency imaging for trauma are relevant.

- A radiologist with pediatric expertise must provide individual practice logs or data that demonstrates the personal care of at least 25 patients five years of age or younger annually.

Documentation

- Provide Radiology tables (with current status of American Board of Radiology certification and pediatric fellowship training delineated), submitted with PRQ.
- Individuals with equivalent training will submit CV and appropriate supporting documentation with PRQ.
- If any individuals are to be considered via alternative pathway, CV and alternative pathway supporting documents, submitted with PRQ.
- If non-pediatric specialty providers participate in call coverage, scope of service documentation for these providers must be provided as well as back up pediatric call schedules.
- Delineation of privileges documents (credentials) will be reviewed at site visit.
- Hospital and department of radiology policies regarding bedside provider presence reviewed at site visit.
- Hospital policies relevant to availability of staff and support personnel for imaging modalities, at site visit.
- Review of call schedules, at site visit.
- Chart reviews, at site visit.
- Interviews with staff, at site visit.

Level III Documentation

- Pediatric-specific CME hours for last three years compiled for each radiologist with pediatric expertise.
- Individual practice logs or data with patient ages/ diagnoses, reviewed at site visit.
- Medical Staff tables with American Board of Radiology certification status and any fellowship training delineated, reviewed at site visit.
- Call schedules will be reviewed at site visit.
- Medical staff interviews, at site visit.
- Chart reviews, at site visit. Children with intussusception, malrotation, and pyloric stenosis will be specifically reviewed; at least five charts in each category pulled.

Resources

Bratton SL, et al. Intussusception: Hospital Size and Risk of Surgery. *Pediatrics*. Feb 2001;107(2):299-303. <https://pediatrics.aappublications.org/content/107/2/299.long>

Jen HC, et al. The Impact of Hospital Type and Experience on the Operative Utilization in Pediatric Intussusception: A Nationwide Study. *J Pediatr Surg*. Jan 2009;44(1):241-246. <https://www.sciencedirect.com/science/article/pii/S0022346808009056?via%3Dihub>

McAteer JP, Kwon S, LaRiviere CA, Oldham KT, Goldin AB. Pediatric specialist care is associated with a lower risk of bowel resection in children with intussusception: A population-based analysis. *J Am Coll Surg*. 2013 Aug;217(2):226-32.e1-3. doi: 10.1016/j.jamcollsurg.2013.02.033. Epub 2013 May 8. PMID: 23664141.

4.8 Imaging Services—Interventional Radiology

Rationale

Specialized radiology services are critical in the management of infants and children with surgical needs.

Definition and Requirements

Level I, Level I Specialty Musculoskeletal, Level I Specialty Oncology, and Level II

The intent is to ensure that appropriate interventional radiology (IR) personnel are available in a Level I or Level II center to provide this care to infants and children whenever it is needed (24/7/365 within 60 minutes). Interventional radiology fellowship training may be obtained in either adult or pediatric settings. ACGME fellowship training or equivalent in addition to being a diplomate, or in the process of becoming a diplomate, of the American Board of Radiology or equivalent is required. Training abroad which is demonstrably equivalent is acceptable. Institutional credentialing must specify privileges for children that match the scope of service provided and are consistent with the pediatric IR call schedule.

- IR physicians must be available 24/7/365.
- Appropriate pediatric support personnel must also be available in-house or within 60 minutes on call.

Documentation

- Table with American Board of Radiology certification status and fellowship training delineated, submitted with PRQ.
- For those with equivalent training, CV and supporting documentation must be submitted.
- Department of radiology and hospital policies regarding timely response of IR providers and support personnel, reviewed at site visit.
- Chart reviews, at site visit.
- Staff interviews, at site visit.
- Call schedules will be reviewed at site visit.
- IR credentialing and delineation of privileging documents will be reviewed at site visit.

Resources

Bratton SL, et al. Intussusception: Hospital Size and Risk of Surgery. *Pediatrics*. Feb 2001;107(2):299-303. <https://pediatrics.aappublications.org/content/107/2/299.long>

Jen HC, et al. The Impact of Hospital Type and Experience on the Operative Utilization in Pediatric Intussusception: A Nationwide Study. *J Pediatr Surg*. Jan 2009;44(1):241-246. <https://www.sciencedirect.com/science/article/pii/S0022346808009056?via%3Dihub>

4.9 Emergency Department Personnel

Rationale

The ability to provide prompt comprehensive pediatric expertise to the bedside 24/7/365 is an important requirement for all centers. All institutions must have emergency department personnel on-site 24/7/365 to care for pediatric patients at the institution. Below are the requirements for emergency department personnel by program level. Level I centers must have specialists with the highest level of pediatric specialty training available 24/7/365 in all disciplines. In the case of emergency medicine, on-site presence is required for Level I verification given the obvious emergent nature of the problems which define the specialty.

Definition and Requirements

A pediatric emergency medicine physician is an individual who is board certified or in the examination process by either the American Board of Pediatrics or the American Board of Emergency Medicine or equivalent in pediatric emergency medicine.

There are two pathways to board certification in pediatric emergency medicine (PEM). One is through the American Board of Pediatrics and the other is through the American Board of Emergency Medicine; both pathways include completion of an Accreditation Council for Graduate Medical Education (ACGME) approved pediatric fellowship.

Individuals in the American Board of Pediatrics pathway and in the final year of training who have completed all clinical requirements of an ACGME-approved pediatric emergency medicine fellowship training program, and who are credentialed by the hospital to work independently as the attending in the emergency department qualify as pediatric emergency medicine physicians for the purposes of this CSV Program.

An individual may also qualify as a pediatric emergency medicine provider by demonstrating equivalent training and experience as detailed in the pediatric emergency medicine alternative pathway delineated in Appendix II of this manual.

Level I

- Level I children's surgical centers must have an attending pediatric emergency physician on-site 24/7/365.

Level I Specialty Musculoskeletal and Level I Specialty Oncology

- Specialty hospitals 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 provisions for emergency care.

Level II and Level III

- Level II and III children's surgical centers must have children's specific emergency department personnel, resources, and policies in place to support the level of verification, including defined training and competency requirements for both physician and non-physician personnel. The intent is to ensure that pediatric expertise is available 24/7/365 across the institution for infants and children with potential surgical problems.
- On-site physician(s) trained in emergency medicine and currently certified by an appropriate ABMS Board or equivalent are required 24/7/365. Providers qualified via the pediatric emergency medicine alternate pathway delineated in Appendix II may be used to fulfill this requirement.

Non-Physician Personnel

The intent is to ensure that the highest level of pediatric expertise in all disciplines is available across the institution for infants and children receiving care (24/7/365). Because there are not uniform national standards (such as ACGME fellowships or boards) in all disciplines, this standard requires that each institution have prospectively established training and competency requirements specific for children. These must include onboarding and ongoing assessment to ensure acquisition and maintenance of pediatric skills and competencies. Personnel in the following disciplines who care for pediatric patients in the emergency room are included in this requirement:

- Nursing
- Pharmacy
- Respiratory therapy
- Social services

Documentation

- Medical staff table with ABMS Board certification status and any fellowship training delineated in PRQ.
- Providers to be considered via the alternative pathway must provide CV and supporting documentation submitted with PRQ.
- Pediatric curriculum for each non-physician discipline delineated, reviewed at site visit.
- Competency assessment tools corresponding with curriculum, reviewed at site visit.
- Hospital policies requiring demonstration of pediatric competency, reviewed at site visit.
- Staff interviews, at site visit.
- Call schedules, reviewed at site visit.

Resources

American College of Surgeons Children's Surgery Verification Quality Improvement Program. *Optimal Resources for Children's Surgical Care v.1*. Available at: <https://www.facs.org/quality-programs/childrens-surgery/childrens-surgery-verification/standards>. Accessed April 13, 2021.

Ames SG, et al. Emergency Department Pediatric Readiness and Mortality in Critically Ill Children. *Pediatrics*. Sept 2019;144(3):e20190568. Available at: <https://pediatrics.aappublications.org/content/144/3/e20190568>. Accessed April 14, 2021.

Gausche-Hill M, Ely M, Schmuhl P, et al. A national assessment of pediatric readiness of emergency departments. *JAMA Pediatr*. 2015;169(6):527-535.

Pediatric Readiness Toolkit. Available at: <https://emscimprovement.center/domains/hospital-based-care/pediatric-readiness-project/readiness-toolkit/>. Accessed April 14, 2021.

Remick K, Gaines B, Ely M, Richards R, Fendya D, Edgerton EA. Pediatric emergency department readiness among US trauma hospitals. *J Trauma Acute Care Surg*. 2019;86(5):803-809.

Remick K, Gausche-Hill M, Joseph MM, et al. Pediatric readiness in the emergency department. *Pediatrics*. 2018;142(5):e20182459.

Remick K, Kaji AH, Olson L, et al. Pediatric readiness and facility verification. *Ann Emerg Med*. 2016 Mar;67(3):320-328.e1. doi: 10.1016/j.annemergmed.2015.07.500. Epub 2015 Aug 29.

4.10 Pediatric Advanced Practice Providers

Rationale

Advanced Practice Providers is a term that includes individuals who may be physician assistants, nurse practitioners, and others who add skills, knowledge, and depth to the surgical team. Their roles and responsibilities have increased dramatically in recent years and while there is considerable variation in roles among locations and institutions, they are an indispensable part of the surgical workforce.

Definition and Requirements

All Levels

- Physician assistants, nurse practitioners, and others have roles with training and licensing requirements that vary by state. These training and licensing requirements must be complete and current in the state of practice(s)
- Pediatric expertise must be demonstrable in the form of specific processes for onboarding and maintenance of pediatric competencies within each center.
- APPs must be integrated into the PIPS process.

Documentation

- Describe the pediatric onboarding and ongoing educational programs specific to the allied health professionals who are part of the surgical team(s).
- Describe the role APPs provide by surgical specialty.
- Provide the team composition by surgical specialty.
- Describe how APPs are integrated in the PIPS process.

Resource

Beaulieu-Jones BR, et al. Advanced providers in pediatric surgery: Evaluation of role and perceived impact. *J Pediatr Surg*. July 15, 2019;55(4):583-589.

4.11 Credentialing

Rationale

Hospitals must assure the public that physicians are appropriately qualified and competent to provide care using the process of credentialing and delineation of privileges. To fulfill this responsibility, centers must review the education and experience of each physician related specifically to the patient population, disease processes, and operative procedures for which the surgeon is being privileged. It is essential in privileging for the care of children that the assessment be based on experience with children. It is also recognized that in some sub-specialties, adult surgeons may have expertise to benefit the care of children. This particularly is the case in situations in which the procedure is more commonly performed in adults. In these situations, it is expected that hospitals will privilege these surgeons for these specific procedures.

Definition and Requirements

All Levels

- The institution must have a process to delineate privileges for operative and anesthesia procedures specifically for children. This must be based on specialty training and experience in caring for children.
- In institutions where pediatric specialists and generalists both provide surgical services for children, there must be delineation of privileges based on complexity of disease processes and procedures. This will define the respective scopes of practice of the pediatric specialist in distinction to the generalist.
- In institutions where adult specialists provide advanced care within a distinct area of expertise, these privileges must be specifically delineated. These must be identified specifically by provider based on specialty experience and training.

Documentation

- Provide the hospital policy regarding credentialing processes.
- Provide relevant privileging documents.
- Complete PRQ surgeon table with required information.
- Credentialing documents for children's medical and surgical specialists will be reviewed at site visit.

Resource

Hoyt DB, Ko CY. *Optimal Resources for Surgical Quality and Safety*. Chicago, IL: American College of Surgeons; 2017.

4.12 Call Coverage

Rationale

Immediate availability of surgeons, anesthesiologists, and medical specialists with expertise in pediatric care is a prerequisite for providing the highest quality care for children with surgical needs. This requires that 24/7 call coverage be available for all specialties. Often this continuous coverage can be provided by physicians with pediatric sub-specialty certification. In some circumstances this might not be possible or even desirable for optimal patient care. Specifically, in some surgical specialties there may be insufficient pediatric subspecialty trained surgeons to provide continuous coverage at all children's surgery centers. Moreover, the addition of sufficient subspecialists to provide this coverage may dilute the distribution of complex surgeries such that it is challenging for surgeons to maintain optimal skills and judgement. Therefore, in some circumstances, first line call coverage may be provided by appropriately trained specialists who lack pediatric subspecialty certification but are specifically privileged by the center to provide a defined scope of pediatric services. A back-up call system is required when appropriately trained specialists who lack pediatric certification are providing call coverage. See Appendices III and IV for specific variations for neurosurgery. This will assure that pediatric specialty level care is continuously available for the more complex patients.

Definition and Requirements

All Levels

- Call schedules for providers involved in children's surgical care must be readily available to hospital staff. The call schedules must provide 24/7 coverage for all surgical and medical specialties required within the scope of practice of the center.

Level I

- Pediatric general and thoracic surgeons and pediatric anesthesiologists must be available 24/7/365.
- In surgical specialties other than pediatric general and thoracic surgery, a portion of this 24/7 coverage may be provided by appropriately trained specialists who lack pediatric certification. The following elements must be included in the institutional plan:
 - A back-up call schedule to provide pediatric subspecialty surgeon coverage 24/7/365. This may be published with limited distribution but must be available to the operating room and appropriately trained specialists who lack pediatric certification.
 - Prospective definition of the scope of practice for the appropriately trained specialists who lack pediatric certification.

- This must delineate the diagnoses, conditions, and procedures that require pediatric subspecialty surgeon care.
 - Monitoring plan and corrective action plan to assure that surgeons are functioning within the defined scope of practice and that the back-up subspecialty care is not delayed.
- The pediatric general and thoracic surgeons and pediatric anesthesiologists on call must be dedicated to the center while on call. If the surgeon or anesthesiologist provides any clinical services in another location while on call, a back-up call schedule must be available.

Level II

- Pediatric general and thoracic surgeons and pediatric anesthesiologists must be available 24/7/365.
- In surgical specialties other than pediatric general and thoracic surgery, a portion of this 24/7 coverage may be provided by appropriately trained specialists who lack pediatric certification. The following elements must be included in the institutional plan:
 - Prospective definition of the scope of practice for the appropriately trained specialists who lack pediatric certification.
 - This must delineate the diagnoses, conditions, and procedures that require pediatric subspecialty surgeon care. Non-pediatric providers must meet all emergent needs for pediatric patients.
 - A transfer plan must be in place if the non-pediatric provider is unable to emergently care for the pediatric patient.
 - The pediatric specialist will resume/assume care of pediatric patients within 24 hours.
 - PIPS will monitor all transfers out and any corrective action plan to assure that surgeons are functioning within the defined scope of practice and that the back-up subspecialty care is not delayed.
- The pediatric general and thoracic surgeons and pediatric anesthesiologists on call must be dedicated to the center while on call. If the surgeon or anesthesiologist provides any clinical services in another location while on call, a back-up call schedule must be available.

Documentation

- All call schedules must be available for review onsite.
- Pediatric back-up call schedules must be uploaded into the PRQ as well as available onsite.
- Delineation of privileges documents.
- PIPS Monitoring plan for scope of practice compliance and results of monitoring.
- Chart review of cases where non-pediatric certified surgeons provided call coverage

4.13 Continuing Medical Education

Rationale

All members of children's surgical specialties who take call must be knowledgeable and current in the care of children with surgical needs. External CME is the recommended method of keeping current.

Definition and Requirements

All Levels

All members of children's surgical specialties who take call must be knowledgeable and current in the care of children with surgical needs. This includes the MDCS, MDCA, and all surgical and medical specialists as delineated by level.

- This requirement can be met by maintaining current board certification of the physician's respective specialty board (Continuous Certification).
- Physicians or surgeons who are currently in the process of board certification (recent graduates) and physicians or surgeons who have lifetime (grandfathered) board certification meet the CME requirement.
- Physicians and surgeons who are not board certified can meet this requirement by (1) documenting the acquisition of 12 hours of relevant pediatric CME per year on average or (2) demonstrating similar 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 PIPS.
- In Level III centers, a general surgeon or anesthesiologist with pediatric expertise must complete 12 or more pediatric *AMA PRA Category 1 Credits™* credit hours annually.
- Providers placed on the Alternative Pathway must follow the Appendix II CME requirements.

Documentation

- Centers will complete the Surgeon, Anesthesiologist, Emergency Physician, Radiology, and Medical Specialist tables showing current board certifications.
- CME certificates and/or summaries, when applicable, must be available onsite for the surveyors to review.
- A list of the 36 hours of children's anesthesia-related; emergency medicine-related; radiology-related continuing medical education during the past three years is required for any alternative pathway physicians (Please refer to the Alternative Pathway for more details). The CSV Program must have documentation of provider CME available at the site visit.

Additional Information

- Examples of external CMEs beyond post graduate courses include program presentations given by visiting professors and invited external speakers, and teaching provided by children's surgeons at external facilities or conferences.

Resources

American Board of Medical Specialties. Available at: <https://www.abms.org/>. Accessed April 14, 2021.

The American Board of Surgery. Available at: <http://www.absurgery.org/>. Accessed April 14, 2021.

4.14 Rapid Response Teams

Rationale

The ability to provide prompt comprehensive pediatric expertise to the bedside 24/7/365 is an important requirement for all centers. All institutions must have a defined pediatric rapid response and/or resuscitation team onsite 24/7/365 to support the scope of services at the institution. Please note, the composition of the team will vary among institutions and by program level.

Definition and Requirements

All Levels

A pediatric rapid response (RRT) and/or resuscitation team is required onsite 24/7/365.

Level I, Level I Specialty Musculoskeletal, and Level I Specialty Oncology:

- 24/7/365 physical presence onsite and participation on this team by a pediatric physician or surgeon who has current pediatric advanced life support (PALS) certification and demonstrable pediatric airway management skills is required.
- Level I center NICUs must have a neonatal rapid response and/or resuscitation team with the 24/7/365 presence of a pediatric provider who has current Neonatal Resuscitation Program (NRP) certification.
- There must be a process in place for pediatric education and skills assessment both for onboarding and maintenance of competency for all team members.
- The perioperative team must be notified of any rapid response activations for surgical patients.
- Surgery-specific analysis of activations and outcomes in surgical patients for this team must be done as part of the surgical PIPS review process. See Chapter 7.

Level II and Level III

- 24/7/365 physical presence onsite and participation on this team by a pediatric physician, surgeon or advanced practice provider who has current pediatric advanced life support (PALS) certification and demonstrable pediatric airway management skills is required.
- If NICU services are provided at the center, the NICU must have a neonatal rapid response and/or resuscitation team with the 24/7/365 presence of a pediatric provider who has current Neonatal Resuscitation Program (NRP) certification.

- There must be a process in place for pediatric education and skills assessment both for onboarding and maintenance of competency for all team members.
- The perioperative team must be notified of any rapid response activations for surgical patients.
- Surgery-specific analysis of activations and outcomes in surgical patients for this team must be done as part of the surgical PIPS review process. See Chapter 7.

Documentation

- Hospital policies regarding pediatric RRT and/or resuscitation team composition, expertise, and availability, submitted with PRQ.
- Hospital policies regarding NICU RRT and/or resuscitation team composition, expertise, and availability, submitted with PRQ.
- Medical Staff tables (with training delineated) submitted with PRQ.
- RRT and/or resuscitation team call schedules reviewed at site visit.
- Chart reviews, at site visit.
- Interviews with staff, at site visit.
- PIPS meeting minutes reviewed at site visit.

Resources

American College of Surgeons Children's Surgery Verification Quality Improvement Program. *Optimal Resources for Children's Surgical Care v.1*. Available at: <https://www.facs.org/quality-programs/childrens-surgery/childrens-surgery-verification/standards>. Accessed April 13, 2021.

Goldstein SD, et al. The "Weekend Effect" in Pediatric Surgery – Increased Mortality for Children Undergoing Urgent Surgery During the Weekend. *J Pediatr Surg*. Jan 2014;49(7):1087-1091. <https://www.sciencedirect.com/science/article/pii/S0022346814000050?via%3Dihub>

4.15 Preoperative Personnel

Rationale

Due to the unique psychosocial needs of infants and children, care of children preoperatively can be challenging. Optimal care requires a multidisciplinary team with training and experience in evaluating and preparing children for anesthesia and surgery. This includes nurses with pediatric expertise, child life specialists and clinicians with specific training and expertise in pediatric mental and/or behavioral health (for example, psychiatrists, psychologists, licensed social workers).

Definition and Requirements

All Levels

- Preoperative personnel and processes must meet the specific needs of the pediatric population served.

Level I, Level I Specialty Musculoskeletal, and Level I Specialty Oncology

- In addition to pediatric preoperative nurses, Level I centers must have child life specialists and clinicians with specific training and expertise in pediatric mental and/or behavioral health care onsite. Reference Standard 4.22.

Non-Physician Personnel

Centers must ensure that the highest level of pediatric expertise in all disciplines is available across the institution for infants and children receiving care (24/7/365). Because there are not uniform national standards (such as ACGME fellowships or boards) in all disciplines, this standard requires that each institution have prospectively established training and competency requirements specific for children. These must include onboarding and ongoing assessment to ensure acquisition and maintenance of pediatric skills and competencies. Personnel in the following disciplines who care for pediatric patients in the preoperative area are included in this requirement:

- Nursing
- Pharmacy
- Respiratory therapy
- Social services

Documentation

- Hospital nursing policies, curriculum and assessment tools including educational requirements/training for pediatric preoperative nursing staff will be reviewed.
- Documentation of availability of Child Life specialists (for Level I centers) will be reviewed. See documentation in Standard 4.22.
- Documentation of availability of pediatric mental health/behavioral health specialists (for Level I centers) will be reviewed.
- Standard will be assessed for compliance during the staff interviews at the center's site visit.

4.16 Operating Room Personnel

Rationale

Care of children in the operating room requires a multidisciplinary team with specific training and experience in caring for children during anesthesia and surgery.

Children in the operating room are cared for by:

- A pediatric anesthesiologist or pediatric anesthesiology care team led by a pediatric anesthesiologist or anesthesiologist with pediatric expertise
- Children's surgeons assisted by trainees and/or physician assistants and others
- Operating room nurses and/or surgical technicians

Optimal care of children in the operating room requires good communication and coordination between all members of the operating room team and the use of processes that enhance multidisciplinary communication such as "Time Out," flowsheets, and perioperative summary discussions.

Definition and Requirements

All Levels

- A dedicated children's operating room (OR) must be adequately staffed and readily available 24/7/365; this is defined as within 60 minutes at any level of children's surgical center. This standard is ideally met by an in-house team for a Level I facility but can be met by having a complete operating room team immediately available by call, so that if a patient requires emergency operative care, the patient can receive it in the most expeditious manner. This criterion cannot be met by individuals who also are dedicated to other functions within the institution. Their primary function must be the operating room.
- There must be personnel with pediatric expertise immediately available and deployed for all patients \leq five years of age.

Non-Physician Personnel

Centers must ensure that the highest level of pediatric expertise in all disciplines is available across the institution for infants and children receiving care (24/7/365). Because there are not uniform national standards (such as ACGME fellowships or Boards) in all disciplines, this standard requires that each institution have prospectively established training and competency requirements specific for children. These must include onboarding and ongoing assessment to ensure acquisition and maintenance of pediatric skills and competencies. Personnel in the following disciplines who care for pediatric patients in the operating areas are included in this requirement:

- Nursing/surgical technicians

Documentation

- Describe the process for ensuring that nurses and surgical technicians are adequately trained to provide care for pediatric surgical patients in the OR, including onboarding and maintenance of skills.
- Describe the process for ensuring pediatric ORs are staffed and immediately available within 60 minutes, 24/7/365.

4.17 Post-Anesthesia Care Unit (PACU) Services

Rationale

With the use of modern general anesthetics that have an improved hemodynamic safety profile but a higher risk of emergence agitation, the care of children in the PACU can be challenging. Many pediatric patients are brought to the PACU while still emerging from general anesthesia so nursing personnel in the PACU need to be particularly adept at pediatric airway management. This requires specially trained nurses who can manage not only the unique aspects of anesthetic emergence and pain management in children, but also the psychosocial needs of the family members who will be caring for patients postoperatively.

Definition and Requirements

All Levels

- Postoperative care of infants and children may be provided in a post-anesthesia care unit (PACU), depending on the patient's needs. A designated PACU or other unit with specific pediatric personnel and functional capacity, including qualified pediatric nurses, must be available 24/7/365 to provide care for the patient if needed during the recovery phase.
- Children less than or equal to five years of age must receive care in a pediatric PACU.
- 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
- Infants and young children are inclined to rapid respiratory and cardiac deterioration, so pediatric nurses caring for children five years or younger in the PACU must have up-to-date airway management skills. See Standard 4.18 Pediatric Nursing.
- Nurses who care for children in the PACU must also have the education and skills necessary to provide family-centered care including detailed parent education for wound care, home medication administration and anticipatory guidance surrounding possible perioperative complications in children.

Non-Physician Personnel

Centers must ensure that the highest level of pediatric expertise in all disciplines is available across the institution for infants and children receiving care (24/7/365). Because there are not uniform national standards (such as ACGME fellowships or boards) in all disciplines, this standard requires that each institution have prospectively established training and competency requirements specific for children. These must include onboarding and ongoing assessment to ensure acquisition and maintenance of pediatric skills and competencies. Personnel in the following disciplines who care for pediatric patients in the PACU are included in this requirement:

- Nursing

Documentation

- Describe the process for ensuring that nurses are adequately trained and skills maintained to provide care for pediatric surgical patients in the PACU.
- Describe and provide supporting documentation for any ongoing education that is provided to PACU nurses to ensure adequate training for pain management and airway management.

4.18 Pediatric Nursing

Rationale

The profession of nursing works in partnership with other health care professionals and pediatric expertise is an essential component for optimal outcomes in the children's surgical population. The Institute of Medicine (IOM) report, *Health Professions Education: A Bridge to Quality* (2003), states "all health professionals should be educated to deliver patient-centered care as members of an interdisciplinary team, emphasizing evidence-based practice, quality improvement approaches, and informatics."

The path to clinical competency of nurses evolves from and has a foundation in nursing education. Clinical learning is an essential component of competency development in nursing and is demonstrated through initial or pre-employment education, onboarding education, specific class training, simulation, in-service training, hands-on experience, and the assistance of mentors and preceptors.

Definition and Requirements

Pediatric nursing care is provided by nurses with specialized knowledge and skills demonstrated by a competency training and continuing education in pediatric nursing. Pediatric nursing competency is reviewed each year per hospital policy.

All Levels

- Perioperative nursing staff with demonstrable relevant pediatric training and expertise is required for all levels of verification.
 - This includes PICU, NICU, PACU, emergency department, operating, and surgical acute care nurses if within the scope of services.
- Nursing staff as defined above are required to successfully complete initial pediatric onboarding and training at the institution.
 - This onboarding training must include relevant education on pediatric growth and development, pediatric fluid management, drug dosing with calculations, airway management, safe sedation management, pain management, pre/postoperative surgical care, and potential surgical complications.
 - The philosophy of family centered care is an integral part of pediatric surgical care and must be incorporated into the education.

- Nursing staff as defined above must maintain required institutional pediatric annual competencies and pediatric annual skill competencies.
 - Nursing practice for pediatric patients with surgical needs must be based on evidence whenever possible and best age-appropriate practice recommendations when evidence is lacking.
- If within the scope of services, ED, NICU, PICU, CICU, OR, PACU, and surgical acute care nurses should maintain resuscitation training certifications required by their institutions. PALS is encouraged for nurses in critical care units and perioperative units. NRP is recommended for the NICU.
- For pediatric nurses who work in a combined adult and pediatric setting, knowledge of pediatrics can be demonstrated by any one of the following methods:
 - Completion of Certified Pediatric Nurse (CPN) requirements
 - 30 percent of their practice dedicated to taking care of pediatric surgical patients

Documentation

- Describe the on boarding for the preoperative, PICU, NICU, PACU, emergency department, operating and room nursing staff.
- Provide the agenda or program curriculum for nursing orientation for the reporting period.
- Provide the required annual competencies for the reporting period.
- Provide percentages of the nursing staff who are BLS, PALS, and NRP certified by unit.
- Provide percentages of nurses who have completed nursing certification such as RNC, CCRN, and so on by unit.
- For pediatric nurses who work in combined adult and pediatric units, document that 30 percent or more of assigned shifts have included pediatric patients over the last three months.

Resources

Institute of Medicine 2011. *The Future of Nursing: Leading Change, Advancing Health*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/12956>

Institute of Medicine (IOM) *Health Professions Education: A Bridge to Quality* (2003). Washington DC: National Academies Press (US). <https://doi.org/10.17226/10681>

4.19 Nutrition Services

Rationale

Critically ill children are at significant risk for malnutrition, which is often associated with adverse clinical outcomes such as mortality, infectious complications, prolonged ventilation, poor wound healing, and increased length of stay. Malnutrition of hospitalized children is significant, with reported incidences from 20 percent to as high as 50 percent. Malnutrition is frequently interpreted as undernutrition; however, it is important to mention that overnutrition in the form of obesity is also identified as a risk factor that adversely affects surgical outcomes. Currently, there is no one universally accepted definition of malnutrition for children in relation to surgical outcomes. However, classification systems and guidelines are being developed to facilitate early identification of at-risk children.

Critically ill children within the PICU setting are different in respect to age, disease type, comorbid conditions, surgical procedure, and pre-existing nutritional status. Therefore, nutritional support interventions must be individualized to match each critically ill patient. Pre-operative nutrition screening and nutritional optimization has been found to improve nutritional outcomes. This comprehensive approach to nutrition management should include all three phases of surgical care, preoperative assessment, operative nutrition considerations and eventually, postoperative recovery.

Significant practice variability exists regarding the optimal timing and form of nutritional support. Algorithms have been utilized to optimize nutrient delivery and allow identification of best practices. In order to avoid the catabolic state often associated with critical illness, the active participation of a multidisciplinary nutritional support team within the critical care setting is considered best practice. Specifically, the input of a dedicated registered dietitian is critical to recognizing and optimizing the child's nutritional needs. Estimating energy needs can be difficult for the pediatric patient undergoing a surgical procedure. A multidisciplinary approach, which balances the prevention of overfeeding while recognizing the increased metabolic needs of a critically ill child, can improve outcomes.

Definition and Requirements

The intent is to ensure that the highest level of pediatric expertise in all disciplines is available across the institution for infants and children receiving care in Level I surgical centers (24/7/365). Because there are not uniform national standards (such as ACGME fellowships or boards) in all disciplines, this standard requires that each institution have prospectively established training and competency requirements specific for children. These must include onboarding and ongoing assessment to ensure acquisition and maintenance of pediatric skills and competencies. Nutritionists who care for pediatric patients are included in this requirement.

All Levels

- Each surgical area within the hospital must have an assigned registered dietician who is knowledgeable of the specific pediatric diagnosis, nutritional needs and meets the above definition for pediatric expertise.

Level I, Level I Specialty Musculoskeletal, Level I Specialty Oncology, and Level II

- Surgical patients in the PICU and NICU must undergo a nutritional assessment within 48 hours of admission. Patients with stays of ≤ 48 hours may be exempted.
- Height (length) and weight in Kg should be included. In children < 36 months of age, head circumference should be included.
 - The nutritional assessment should be re-evaluated on a weekly basis, at minimum, throughout the critical care phase of care.
 - Centers must document a BMI in the EMR.
- A dedicated registered dietician must be available and must facilitate timely nutrition assessment, optimal nutrient delivery and appropriate adjustments when needed for the patient.

Level III

- A screening method for the children's surgical population to identify patients at risk of malnutrition must be implemented, and a nutritional treatment plan should be documented when needed.

Documentation

- Centers must provide the percentage of NICU and PICU surgical patients that have a nutrition assessment done within 48 hours of admission.
- Describe method of screening for malnutrition.
- Nutritional assessments and treatment plans will be reviewed at site visits in chart reviews and staff interviews.

Resources

Mehta NM, et al. Nutritional practices and their relationship to clinical outcomes in critically ill children--an international multicenter cohort study*. *Critical Care Medicine*. 2012;40(7):2204-2211.

Mehta NM, et al. *Guidelines for the Provision and Assessment of Nutrition Support Therapy in the Pediatric Critically Ill Patient: Society of Critical Care Medicine and American Society for Parenteral and Enteral Nutrition*. *JPEN*. 2017;41(5):706-742.

4.20 Pharmacy Services

Rationale

The value and impact of the pediatric trained clinical pharmacist within the children's environment is well documented. Clinical pharmacists are licensed professionals who have completed accredited postgraduate clinical training (or have equivalent post-graduate clinical experience), have achieved board certification in a Board of Pharmacy Specialties clinical specialty, and are practicing in team-based, direct patient care environments. Clinical pediatric pharmacy services should be prioritized to provide the highest level of care to populations that are at the highest risk, such as patients in the PICU, NICU, hematology/oncology, operating room, and the emergency department.

Patient response to medication therapy is highly variable and adverse events in children can occur. Clinical pharmacists within a multidisciplinary care team play an integral role in the use of specific medications, the prevention of medication errors and thus demonstration of improved outcomes. Medication issues include omission of medications, over-dosing, under-dosing, and administrative error. In support of clinical pharmacists, The Joint Commission assigns pediatric clinical pharmacists a significant role in pediatric drug safety initiatives.

The comprehensive input from the clinical pharmacist should include but not be limited to patient care rounds, drug therapy monitoring, drug information, medication profile review, medication reconciliation, adverse drug event surveillance, patient education and discharge counseling. Participation in antimicrobial stewardship is optimal. The clinical pharmacist within a pediatric setting must have specific pediatric expertise and understand the uniqueness of the child, including the specific and often complex pediatric conditions and the pharmaceutical interventions that are required.

Definition and Requirements

Level I, Level I Specialty Musculoskeletal, Level I Specialty Oncology, and Level II

- 24/7/365 pediatric pharmacy services must be provided to the pediatric population.
- Essential services include clinical pharmacy services in specialized, high-risk areas, such as the PICU, NICU, hematology/oncology unit, operating room, and emergency department.
- A list of medications to be accessible and the policies and procedures regarding their administration must be developed by a multidisciplinary Pharmacy and Therapeutics (P&T) Committee or its equivalent.
- A pharmacist with pediatric training should be appointed to the Pharmacy and Therapeutics Committee.
- Pharmacists with pediatric training should participate in neonatal and pediatric codes.
- Pediatric clinical pharmacy onboarding training must include at the minimum, the following core competencies: pharmacokinetic and pharmacodynamic differences, weight-based dosing and calculations, common pediatric diseases, drug side effects and interactions, and specialized drug preparation and administration techniques for pediatric patients.
- Pediatric clinical pharmacist competencies must be established and then periodically reassessed.
- Computerized provider order entry must support the following requirements for safe medication use and be reviewed by the pediatric pharmacy department or by a pediatric pharmacy specialist within an adult health system (Level I and II). Required data elements include:
 - Age-specific
 - Weight-specific
 - Specific drug dose checking
 - Dose capping

Documentation

- Centers must describe their pediatric pharmacy services, formulary management and relevant prescribing policies, as well as training, onboarding and maintenance of competency processes and requirements.

Resources

Bhatt-Mehta V, et al. Recommendations for meeting the pediatric patient's need for a clinical pharmacist: a joint opinion of the Pediatrics Practice and Research Network of the American College of Clinical Pharmacy and the Pediatric Pharmacy Advocacy Group. *Pharmacotherapy*. 2013;33(2):243-251.

Drovandi A, et al. A systematic review of clinical pharmacist interventions in paediatric hospital patients. *European Journal of Pediatrics*. 2018;177(8):1139-1148.

Eiland LS, et al. ASHP—PPAG Guidelines for Providing Pediatric Pharmacy Services in Hospitals and Health Systems. *American Journal of Health-System Pharmacy*. 2018;75(15):1151-1165.

Graabaek T, Kjeldsen LJ. Medication reviews by clinical pharmacists at hospitals lead to improved patient outcomes: A systematic review. *Basic & Clinical Pharmacology & Toxicology*. 2013;112(6):359-373.

Krupicka MI, et al. Impact of a pediatric clinical pharmacist in the pediatric intensive care unit. *Critical Care Medicine*. 2002;30(4):919-921.

Saseen JJ, et al. ACCP Clinical Pharmacist Competencies. *Pharmacotherapy: The Journal of Human Pharmacology and Drug Therapy*. 2017;37(5):630-636.

4.21 Respiratory Therapy Services

Rationale

The respiratory therapist applies scientific knowledge and theory to the clinical problems of respiratory care and is qualified to assume primary responsibility for the delivery of all respiratory modalities. Respiratory therapists can practice in all areas throughout the hospital; however, specific pediatric expertise, including for premature infants, is required at the highest levels of care. Respiratory care practitioners can provide clinical expertise regarding airway management during air and ground transport.

Respiratory therapy licensure is required in nearly all states, although the requirements to obtain licensure varies somewhat from state to state. The National Board for Respiratory Care (NBRC) offers two levels of certification: (1) Certified Respiratory Therapist (CRT) credential or (2) Registered Respiratory Therapist (RRT).

Privileges, specifically related to intubation by a respiratory therapist, vary between states and institutions. For those respiratory therapists who have institutional privilege to intubate, a yearly competency assessment is recommended.

Documentation

- Centers must describe their respiratory therapy team and any relevant respiratory therapy policies relating to children's surgery, as well as training, onboarding, and maintenance of competency processes and requirements.

Definition and Requirements

All Levels

- High-risk clinical areas, such as PICU, NICU, CICU and ED must have dedicated respiratory therapy support by respiratory therapists with pediatric expertise 24/7/365.
- Respiratory therapists who perform clinical care to high risk pediatric clinical areas should maintain resuscitation training certifications required by their institutions. PALS is encouraged for therapists in critical care units and perioperative units. NRP is recommended for the NICU.
- A respiratory therapist with a practice history within a high-risk pediatric clinical area, must be included on the hospital's pediatric rapid response resuscitation team.
- Because there are not uniform national RRT training standards in pediatrics, this standard requires that each institution have prospectively established training and competency requirements specific for children. These must include onboarding and ongoing assessment to ensure acquisition and maintenance of pediatric skills and competencies.

4.22 Child Life Services

Rationale

Illness and hospitalization are stressful life events for children and their families. Over the past 30 years, there has been a concerted effort to improve the psychosocial and emotional well-being of the child, in addition to that of siblings and extended family. The child life specialist is an integral component of the multidisciplinary health care team, which can enhance the well-being and healthy coping of all family members during times of stress. Child life specialists embrace play as a healing modality, using developmentally appropriate interventions before and after surgical interventions. Multiple studies indicate that the interventions of child life specialists result not only in better coping for the child, but also in less narcotic use, reduced hospitalization length of stay and increased parent satisfaction. While the predominant goal is to support the child, an essential component is to provide support to the family and siblings.

While frequently overlooked, the knowledge and resources of a child life specialist during the phase of death, dying and bereavement provide essential family support to promote healing. For maximum benefit, the hospital bereavement program should incorporate the role of the child life specialist into the overarching bereavement program structure.

While the benefits of a child life specialist are well documented, there is limited awareness of the child life services and responsibilities outside of the pediatric health care community. The profession of a child life specialist is unique, as individuals can work in a variety of settings with various surgical populations. Continued promotion of the child life specialist role and expertise will continue to benefit all.

Definition and Requirements

Level I, Level I Specialty Musculoskeletal, Level I Specialty Oncology, and Level II

- A child life specialist must have a minimum of a bachelor's degree, complete a clinical internship and be certified through the Association of Child Life Professionals (ACLP).
- Child life specialists must be available seven days a week. There must be adequate staffing to meet the needs of the surgical patient population. Each hospital must identify a surgical population (inpatient and outpatient) where child life specialists are most needed.

- Child life specialists must focus on promoting coping skills and minimizing the adverse effects of hospitalization, health care and/or other potentially stressful experiences which may be overwhelming for the child and family.
 - End-of-life support with a hospital endorsed bereavement program must be incorporated into the child life specialist responsibilities.

Documentation

- Centers must describe the composition of the child life team, including number of members and designated service areas.
- Centers must describe their processes for ensuring adequate child life support in high-need areas.
- CVs of perioperative child life specialists.

Resources

Association of Child Life Professionals. *Mission, values, and vision*. Available at: <https://www.childlife.org/>. Accessed April 14, 2021.

Policy Statement from the American Academy of Pediatrics: Child life services. *Pediatrics*. 2014;133(5). Available at: www.pediatrics.org/cgi/content/full/133/5/e1471. Reaffirmed February 2018.

Romito B, Jewell J, Jackson M, AAP Committee on Hospital Care; Association of Child Life Professionals. *Pediatrics*. Jan 2021;147(1):e2020040261. DOI: 10.1542/peds.2020-040261

4.23 Child Maltreatment Services

Rationale

Best Practices Guidelines for Trauma Center Recognition of Child Abuse, Elder Abuse, and Intimate Partner Violence was published by the American College of Surgeons in November 2019 and provides a comprehensive synopsis of child maltreatment. References from this document provide the basis for the following recommendations.

Child protective teams were established more than 50 years ago. While the composition of the team is not specific, high quality child protective teams are interdisciplinary and have some mandatory components. Partnership with a child abuse physician is critical to the successful management of these patients. These physicians are responsible for the diagnosis and treatment of children and adolescents who are suspected victims of any form of child maltreatment including physical abuse, sexual abuse, sexual violence, and neglect. In collaboration with social services personnel, the child abuse physician coordinates investigations of child protective services and law enforcement. When these resources are not available within an institution for a child protective team, transfer agreements must be in place to ensure children are appropriately evaluated for possible abuse. Telemedicine may also be an option.

As advocates for children's health, hospitals that provide care for children have the responsibility to develop a system to screen for child maltreatment. Multiple valid screening tools have been identified to use in a variety of settings. A positive clinical screen identifies patients with a higher probability of physical abuse.

All states, the District of Columbia and the U.S. Territories have laws that mandate the reporting of suspected child abuse to Child Protective Services. Ongoing education on the specifics of each state reporting laws must be incorporated into the culture of the hospital.

Definition and Requirements

All Levels

- A valid screening tool to identify child maltreatment must be implemented specifically for the high-risk pediatric population.
- An institutional policy for recognition and reporting of child maltreatment must be present.

Level I, Level I Specialty Musculoskeletal, and Level I Specialty Oncology

- A dedicated child protective or child maltreatment team must be available 24/7/365 for consultation.
- Mandatory team members must include a board-certified child abuse pediatrician (or in the examination process) and social services.
- The medical director of the child maltreatment team could be a board certified (or in the examination process) child abuse pediatrician or a pediatrician with a special interest in child maltreatment who dedicates > 50 percent of their practice to this role.
- Social services personnel within the child maltreatment team must have training in the dynamics of child abuse, its assessment and management in a hospital setting, child abuse reporting laws, and appropriate interventions and support. Crisis intervention is optimal.

Level II

- A dedicated child protective or child maltreatment team must be available 24/7/365 for consultation.
- Mandatory team members include a board-certified child abuse pediatrician (or in the examination process child abuse pediatrician) or a pediatrician with a special interest in child maltreatment who dedicates > 50 percent of their practice to this role.
- Social services personnel within the child maltreatment team must have training in the dynamics of child abuse, its assessment and management in a hospital setting, child abuse reporting laws, and appropriate interventions and support. Crisis intervention is optimal.

Level III

- A medical director of the child maltreatment team may be an identified pediatrician who has expressed commitment and experience in child maltreatment.
- While a child maltreatment team is recommended, transfer agreements are acceptable to provide those services when not available.

Documentation

- Define the screening population, methodology by a guideline or protocol. Demonstrate compliance with screening.
- Provide institutional policy for recognition and reporting of child maltreatment.
- Provide CV of Child Maltreatment Director.
- Social services training and education.

Resources

Berger RP, Lindberg DM. Early Recognition of Physical Abuse: Bridging the Gap between Knowledge and Practice. *Journal of Pediatrics*. 2018;204:16-23.

Best Practices Guidelines for Trauma Center Recognition of Child Abuse, Elder Abuse, and Intimate Partner Violence. American College of Surgeons Trauma Quality Programs. November 2019. Available at: https://www.facs.org/-/media/files/quality-programs/trauma/tqip/abuse_guidelines.ashx. Accessed April 14, 2021.

Escobar MA Jr, Flynn-O'Brien KT, Auerbach M, Tiyyagura G, Borgman MA, Duffy SJ, Falcone KS, Burke RV, Cox JM, Maguire SA. The association of nonaccidental trauma with historical factors, examination findings, and diagnostic testing during the initial trauma evaluation. *J Trauma Acute Care Surg*. 2017 Jun;82(6):1147-1157. doi: 10.1097/TA.0000000000001441.

Escobar MA Jr, Pflugeisen BM, Duralde Y, Morris CJ, Haferbecker D, Amoroso PJ, Lemley H, Pohlson EC. Development of a systematic protocol to identify victims of non-accidental trauma. *Pediatr Surg Int*. 2016 Apr;32(4):377-386. doi:10.1007/s00383-016-3863-8. Epub 2016 Jan 25.

Escobar MA Jr, Wallenstein KG, Christison-Lagay ER, Naiditch JA, Petty JK. Child abuse and the pediatric surgeon: A position statement from the Trauma Committee, the Board of Governors and the Membership of the American Pediatric Surgical Association. *J Pediatr Surg*. 2019 Jul;54(7):1277-1285. doi:10.1016/j.jpedsurg.2019.03.009. Epub 2019 Mar 21.

The Evaluation of Suspected Child Physical Abuse Cindy W. Christian and Committee on Child Abuse and Neglect. *Pediatrics*. April 2015. DOI: <https://doi.org/10.1542/peds.2015-0356>

Narang SK, Fingarson A, Lukefahr J, AAP Council on Child Abuse and Neglect. Abusive Head Trauma in Infants and Children. *Pediatrics*. 2020;145(4):e20200203.

4.24 Laboratory Services

Rationale

Hospital-based laboratories are essential to support the inpatient and outpatient needs of the surgical patient. The premise of the laboratory is that this system will provide accurate, safe and timely results in order to support the clinician in making appropriate decisions. Several regulations and compliance requirements are in place to ensure validity.

Definition and Requirements

All Levels

- The blood bank must be capable of typing and cross-matching blood 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.
- Pediatric laboratory services to support the scope of service offered must be available 24/7/365 for standard analyses of blood, urine, and other body fluids, which includes micro-sampling when appropriate.
- Coagulation studies, blood gas analysis and microbiology studies must be available 24/7/365.

Level I, Level I Specialty Musculoskeletal, and Level I Specialty Oncology

- An anatomic pathologist with appropriate pediatric expertise must be on the medical staff and available 24/7/365 for consultations.

Level I, Level I Specialty Musculoskeletal, Level I Specialty Oncology, and Level II

- The department of laboratory services must have a dedicated pediatric component that meets the needs of the patients and their caregivers.

Documentation

- Centers must provide pediatric credentials for the pathologist(s).
- Staff interviews, at site visit.
- Chart reviews, at site visit.

4.25 Renal Replacement Services

Rationale

Specialized support services are required to care optimally for infants and children with surgical needs.

Definition and Requirements

Level I, Level I Specialty Musculoskeletal, and Level I Specialty Oncology

- Acute renal replacement therapy must be available 24/7/365 for infants and children within the scope of service.

Level II and Level III

- Level II and Level III facilities that do not have renal replacement capabilities must have appropriate transfer agreements in place.
-

Documentation

- Centers must provide documentation of pediatric training and experience of the team providing renal replacement therapy.
- Transfer agreements reviewed at visit if needed.

4.26 Transport Services

Rationale

Pediatric critical care transport services, either by ground ambulances, rotor-wing or fixed-wing aircraft, have become more regionalized across the U.S. in the past 20 years. Voluntary accreditation is through The Commission on Accreditation of Medical Transport Systems (CAMTS). Both air and ground transport services are increasingly required to ensure that children are safely transported to an appropriate level of care in a timely manner. Each of these transport modalities have advantages and disadvantages that must be considered to best meet the needs of the pediatric patient. An efficient, well-trained ground ambulance program remains the backbone of inter-hospital transport systems, however, all modalities (ground, rotor-wing, and fixed wing) should be considered in any specific patient situation.

Transport Medicine has developed as a specialty. Moving a critically ill child from one location to another is stressful for the patient, family and even the transporting team. Thoughtful design, pre-planning and monitoring of the transport process has been shown to improve the outcome in critically ill pediatric patients. One key to providing safe transfer from the community to tertiary pediatric care centers is a highly qualified transport team. The composition of the transport team is not standardized but a configuration of nurses and respiratory therapists is the most prevalent model. Initial and ongoing education is essential for transport team members.

Feedback to the initial hospital for every transport is not required. However, when clinical care issues on initial stabilization and/or management are identified, it is the responsibility of the transport team and/or receiving hospital to provide feedback to improve care for future patients.

Definition and Requirements

All Levels

- The ability to stabilize and transfer critically ill children must be demonstrated.
- The receiving hospital must have a written policy regarding hospital-to-hospital communication that includes pre-transfer workup information, determination of best method of transport (in other words, air versus ground), and patient stabilization requirements.
- Well defined evidence-based protocols dealing with specific clinical situations must be developed and utilized.

- A comprehensive quality improvement and safety program is essential. The complement of personnel, mode of transport, and medical control policies will vary by location, but must be included in the quality analysis.
- A mechanism of feedback to the referring center regarding the patient's diagnosis, therapy and clinical condition must be in place. See Standard 7.7 Transport and Transfer Review for further details.
- Specific analysis of surgical patient transports must be included in the PIPS process. See Standard 7.7 Transport and Transfer Review for further details.

Level I, Level I Specialty Musculoskeletal, and Level I Specialty Oncology

- A transport team for neonatal and pediatric patients within the scope of service is essential. Personnel must have specific training in advanced airway management skills and a skills maintenance program as outlined in 11th Edition Accreditation Standards as published by the Commission on Accreditation of Medical Transport Systems (CAMTS) (<https://www.camts.org/standards/>).
- A back-up plan is required when all the available teams are already deployed and there is a patient transfer need.
- A medical director of the transport team must be a physician with acute care experience who has working knowledge of transport medicine including infants and children and who assumes overarching responsibility of the program.
- Transport team members must have onboarding education at a minimum in the following: pediatric critical care pathophysiology, physiological effects of transport on the pediatric patient, technical skills for emergency management, and adaptation to the physical environment of the transport vehicle as outlined in the Commission on Accreditation of Medical Transport Systems (CAMTS) standards (<https://www.camts.org/standards/>).

Level II and Level III

- Level II and Level III centers must have a relationship with and deploy a pediatric-specific transport team when transferring appropriate infants and children to and from their centers.
- Level III centers have the responsibility to transfer critically ill patients; however, when children or adolescents are treated locally, there must be joint decision-making and a process in place to ensure prompt availability of ICU physician and surgeon coverage 24/7/365.

Documentation

- Detail the composition of the transport team including the experience and training of personnel.
- Detail how the applicant center exercises medical control during transport.
- Provide policies that assure means for effective communication between the referring and receiving center, including feedback after the transport.
- Provide the job description of the Medical Director.
- Provide the number of pediatric transports categorized by age.
- Describe the methods of transport available.
- Provide the number of times transports were aborted or declined and associated reasons.
- Provide an example of a quality improvement project related to transport.

Resources

11th Edition Accreditation Standards of the Commission on Accreditation of Medical Transport Systems (CAMTS). Available at: <https://www.camts.org/standards/>. Accessed April 14, 2021.

Insoft RM, Schwartz HP, Romito R, AAP Section on Transport Medicine, eds. Guidelines for Air and Ground Transport of Neonatal and Pediatric Patients, 4th edition. Available at: <https://shop.aap.org/guidelines-for-air-and-ground-transport-of-neonatal-and-pediatric-patients-4th-edition-paperback/>. Accessed April 14, 2021.

Meyer K, Fernandes CJ, Schwartz HP, AAP Section on Transport Medicine. Field Guide for Air and Ground Transport of Neonatal and Pediatric Patients. Available at: <https://shop.aap.org/field-guide-for-air-and-ground-transport-of-neonatal-and-pediatric-patients-ebook/>. Accessed April 14, 2021.



AMERICAN COLLEGE OF SURGEONS
CHILDREN'S SURGERY VERIFICATION QUALITY IMPROVEMENT PROGRAM

5 Patient Care: Expectations and Protocols

5.1 Operating Room Protocols

Rationale

Immediately available and appropriately staffed and equipped operating rooms are critical for the care infants and children with surgical diseases. While the specific mechanisms to assure this will vary by hospital volume and workflow, every hospital must have an immediately available team, provision for additional operating rooms when the first room is occupied and structured means to assure that system responds as planned.

Definition and Requirements

Centers must demonstrate the ability to provide appropriate staffing and response times for all surgical patients in the operating rooms.

All Levels

- OR processes must meet the specific needs of the pediatric population and must be demonstrable at all levels of verification.
- 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). Surgical center must have a process in place to identify and address any cases that do not meet the 60-minute requirement.
- The availability of children’s specialty OR personnel and timeliness of starting operations must be evaluated by the hospital PIPS process. Appropriate measures must be implemented as required to ensure response times that yield timely and high quality of care.
- If the first OR becomes occupied, a mechanism for providing additional appropriate pediatric staff members must be in place to staff a second operation.
 - This standard is ideally met by an in-house team but can be met by having a complete OR team on call and immediately available. Institutions must define the circumstances that would require the deployment of a back-up team.
 - This back-up OR must be available within 60 minutes of identified need.

Documentation

- Institutions must provide the policy regarding the expected response time for in-house operating room (OR) team and for out-of-hospital call team.
- Institutions must provide audit data for emergent cases and timeliness of operating room start.

Resource

American College of Surgeons Children’s Surgery Verification Quality Improvement Program. *Optimal Resources for Children’s Surgical Care v.1*. Available at: <https://www.facs.org/quality-programs/childrens-surgery/childrens-surgery-verification/standards>. Accessed April 13, 2021.

5.2 Radiology Protocols

Rationale

Diagnostic support from qualified radiologists is critical in the care of children with surgical diseases. For this support to be effective communication must be timely and accurate. Some findings are time sensitive and must be communicated directly to the care team. All findings and impressions must be communicated in a permanent fashion in the medical record. Part of the accurate reporting is recording any changes made to findings or impressions after review. This is essential for quality assurance and to allow clear understanding of how diagnostic studies influence the clinical decision-making. Given the radiation exposure and cost associated with diagnostic studies, good stewardship requires that there be periodic review of trends in utilization to assess for appropriateness.

Standardization using protocols optimizes the quality of studies and decreases the risk of needing to repeat inappropriately performed studies.

Definition and Requirements

All Levels

- Diagnostic information from radiologic imaging studies must be communicated in a written form and in a timely manner to the primary surgical team.
- Critical information that is deemed to immediately affect patient care must be verbally communicated to the primary surgical team. These critical items must be identified prospectively. Evidence that this verbal communication occurs must be tracked in writing.
- 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.
- A pediatric radiologist must be involved in the development of protocols and analysis of trends that relate to diagnostic imaging. This role may be satisfied by a radiologist with pediatric expertise in a Level III center.
- 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 pediatric-specific support equipment during transportation to and from and within the radiology department.

Documentation

- Centers will be required to provide the following documentation during the onsite review:
 - Institutional policies regarding pediatric radiology support staff and availability
 - Institutional policies regarding bedside presence of the interventional radiologist
 - Critical finding reporting policy
 - Protocols for standardization of diagnostic studies
 - Standards for resuscitation and monitoring
 - Data from analysis of trends

Resource

American College of Surgeons Children's Surgery Verification Quality Improvement Program. *Optimal Resources for Children's Surgical Care v.1*. Available at: <https://www.facs.org/quality-programs/childrens-surgery/childrens-surgery-verification/standards>. Accessed April 13, 2021.

5.3 Massive Transfusion Protocol (MTP)

Rationale

More than 80 percent of deaths in the operating room (OR) and nearly 50 percent of deaths in the first 24 hours after injury are due to exsanguination and coagulopathy. Because massive transfusions are unplanned and require the processing and delivery of large amounts of blood products rapidly for a sustained period of time, significant preplanning and coordination between the blood bank, the emergency department, the OR, and delivery personnel is required at Level I children's surgical centers.

Definition and Requirements

A massive transfusion protocol must be in place at Level I children's surgical centers and Level I specialty oncology/musculoskeletal centers.

Level I, Level I Specialty Musculoskeletal, and Level I Specialty Oncology:

- The children's surgical center must have a massive transfusion protocol (MTP). The protocol must be a written document, available to all staff, and approved by administration.
- The MTP must address:
 - Triggers for initiating massive transfusion
 - Resuscitation: MTP product availability, product delivery, and blood product transfusion
 - Continuing MTP in the OR, angiography suite and intensive care unit
 - Transfusion service processes for delivery of blood products
 - Transfusion targets
 - The use of adjuncts for MTP patients
 - Termination of MTP
 - Performance improvement monitoring
- The MTP must be developed by a multidisciplinary committee that includes, at a minimum, representatives from:
 - Transfusion service or blood bank
 - Emergency department
 - Anesthesia
 - Surgical representations from the PIPS Committee

- The PIPS program must monitor the appropriate use and timely and adequacy of the response of the MTP. Metrics which must be reviewed at least annually include number of activations, missed activations (patients receiving large volume of transfusion without MTP activation), time from activation to first available blood products, inability to supply products as requested in timely fashion, and blood product wasted. The center should set specific goals for each metric and monitor for compliance.

Level II and Level III

- Level II, III children's surgical center are not required to have a massive transfusion protocol but must be able to effectively stabilize and transfer critically ill patients to a higher level of care.

Documentation

- Institutions must provide the massive transfusion protocol.

Resource

ACS TQIP Massive Transfusion in Trauma Guidelines. American College of Surgeons Trauma Quality Improvement Program. October 2014. Available at: https://www.facs.org/-/media/files/quality-programs/trauma/tqip/transfusion_guildelines.ashx. Accessed April 14, 2021.

5.4 Opioid Stewardship

Rationale

Overdose deaths have more than tripled in the past 15 years, and most of these are attributable to opioids. In addition, child opioid poisonings have increased by two-fold over the past 25 years. The use of opioid medications can rapidly lead to dependence and addiction and should be used sparingly for acute pain management. Multimodal analgesia regimens that include the use of around-the-clock acetaminophen and/or ibuprofen, local anesthetics, and physical modalities such as ice reduce the need for opioid analgesics and are safe for the majority of children. Recent studies have shown that frequently only a portion of a postoperative opioid prescription is used by patients having common surgeries and that opioid prescription leftovers are often a source of diverted opioid pain medications. Stewardship of opioids is a responsibility of all providers and health systems.

Definition and Requirements

The Children's Surgery Verification Program endorses the development of multidisciplinary strategies to promote multimodal analgesia and opioid sparing analgesic regimens for children undergoing surgical procedures. Institutions providing optimal care for children have an obligation to develop practice guidelines that provide guidance on opioid dosing for common surgical procedures and track both intraoperative opioid use and outpatient opioid prescribing. Opioid stewardship programs should be led by a multidisciplinary team including surgical, anesthesia, and nursing leaders.

Level I, Level I Specialty Musculoskeletal, Level I Specialty Oncology, and Level II

- Required to have a children's Opioid Stewardship program with the following core elements/activities:
 - Development of institution-wide guidelines to encourage opioid-sparing analgesic regimens utilizing local anesthetics, around-the-clock acetaminophen and NSAIDs, etc.
 - Develop departmental guidance on opioid prescribing for common childhood surgical procedures.
 - Provide institutional support for key personnel effort to track opioid prescribing.
 - Regular reporting on opioid prescribing at least annually at PIPS meetings.

- At Level I centers, all children's surgical specialties and critical care units (NICU, PICU, CICU) should also be engaged in activities to promote opioid stewardship for their respective surgical populations. These include but are not limited to standardized order sets and decision-support tools.
- All Level I and II centers must be continually engaged in at least one data-driven quality improvement project to promote multimodal analgesic strategies and opioid stewardship involving children's surgical patients. Updates relevant to these activities should be presented at PIPS at least annually.

Level III

- Must demonstrate guidelines in place for opioid prescribing and the use of multimodal analgesic strategies.

Documentation

Level I, Level I Specialty Musculoskeletal, Level I Specialty Oncology, and Level II

- Level I and II centers must provide evidence of ongoing measurement of opioid prescribing for surgical patients, and evidence of communication between surgical departments and PIPS.
- Level I and II centers must demonstrate evidence of data review and discussion around opioid stewardship in their PIPS minutes.
- Each surgical specialty from Level I, Level I Specialty, and Level II centers must furnish evidence of their respective activities and quality improvement projects to promote/facilitate opioid stewardship.

Level III

- Must provide written guidelines in place for opioid prescribing and the use of multimodal analgesic strategies.

Resources

Gaither JR, Leventhal JM, Ryan SA, Camenga DR. National Trends in Hospitalizations for Opioid Poisonings Among Children and Adolescents, 1997 to 2012. *JAMA Pediatr.* 2016;170(12):1195-1201.

Groenewald CB, Zhou C, Palermo TM, et al. Associations between opioid prescribing patterns and overdose among privately insured adolescents. *Pediatrics.* 2019;144(5):e20184070.

Hartling L, Ali S, Dryden DM, et al. How Safe Are Common Analgesics for the Treatment of Acute Pain for Children? A Systematic Review. *Pain Res Manag.* 2016;2016:5346819.

Kelley-Quon LI, Kirkpatrick MG, Ricca RL, et al. Guidelines for Opioid Prescribing in Children and Adolescents After Surgery: An Expert Panel Opinion. *JAMA Surg.* 2021;156(1):76-90. doi:10.1001/jamasurg.2020.5045

Key Substance Use and Mental Health Indicators in the United States: Results from the 2016 National Survey on Drug Use and Health. Available at: <https://nsduhweb.rti.org/respweb/homepage.cfm>. Accessed April 14, 2021.

McCabe SE, West BT, Boyd CJ. Leftover prescription opioids and nonmedical use among high school seniors: A multi-cohort national study. *J Adolesc Health.* 2013;52(4):480-485.

Monitto CL, Hsu A, Gao S, et al. Opioid Prescribing for the Treatment of Acute Pain in Children on Hospital Discharge. *Anesth Analg.* 2017 Dec;125(6):2113-2122.

Ross-Durow PL, McCabe SE, Boyd CJ. Adolescents' access to their own prescription medications in the home. *J Adolesc Health.* 2013;53(2):260-264.

Rudd RA, Seth P, David F, et al. Increases in drug and opioid-involved overdose deaths. United States, 2010-2015. *CDC. MMWR.* 2016;65:1445-1452.

Wong I, St John-Green C, Walker SM. Opioid-sparing effects of perioperative paracetamol and nonsteroidal anti-inflammatory drugs (NSAIDs) in children. *Pediatric Anesthesia.* 2013;23:475-495.

5.5 Perioperative Antibiotic Stewardship

Rationale

The Children's Surgery Verification Program endorses the collection and multidisciplinary review of antibiotic utilization data for children undergoing surgical procedures. These include use of antibiotics for perioperative prophylaxis as well as for the treatment of established infections. Institutions providing optimal care for children have an obligation to participate in the collection of antibiotic utilization data, determine whether practices are aligned with consensus guidelines, provide a mechanism to ensure compliance with evidence-based guidelines, and engage in activities to promote best practices for the responsible use of antibiotics.

Definition and Requirements

Level I, Level I Specialty Musculoskeletal, Level I Specialty Oncology, and Level II

- Required to have a children's Antibiotic Stewardship Program (ASP) with the following core elements/activities:
 - Co-leadership framework including both pharmacy and physician representation
 - Monitoring of antibiotic prescribing and antimicrobial resistance patterns
 - Regular reporting on antibiotic use, resistance patterns and stewardship activities to hospital leadership
 - Educating clinicians about antimicrobial resistance and optimal prescribing
- Required to review internal ASP data relevant to surgical patients at PIPS at least annually.
- Required to review ACS NSQIP Pediatric surgical antimicrobial prophylaxis data semi-annually at PIPS.
- At Level I centers, all children's surgical specialties and critical care units (NICU, PICU, CICU) should also be engaged in activities to promote antimicrobial stewardship for their respective surgical populations. These include, but are not limited to, standardized order sets, decision-support tools, and antibiotic utilization guidelines for prophylaxis and treatment.
- All Level I and II centers must be continually engaged in at least one data-driven quality improvement project to promote antibiotic stewardship around either prophylaxis or treatment involving surgical patients. Updates relevant to these activities should be presented at PIPS at least annually.

Level III

- All Level III centers must be continually engaged in at least one data-driven quality improvement project to promote antibiotic stewardship around either prophylaxis or treatment involving surgical patients. Updates relevant to these activities should be presented at PIPS at least annually.

Documentation

Level I, Level I Specialty Musculoskeletal, Level I Specialty Oncology, and Level II

- Level I and II centers must provide evidence of ongoing measurement of antibiotic stewardship for surgical patients, and evidence of communication between surgical departments and PIPS.
- Level I and II centers must demonstrate evidence of data review and discussion around antibiotic stewardship in their PIPS minutes.
- Each surgical specialty from Level I, Level I Specialty, and Level II centers must furnish evidence of their respective activities and quality improvement projects to promote/facilitate antibiotic stewardship.

Level III

- Each surgical specialty from Level III centers must furnish evidence of their respective activities and quality improvement projects to promote/facilitate antimicrobial stewardship.

Resources

Berrios-Torres, et al. *JAMA Surg.* 2017;152(8):784-791.

Bratzler, et al. *Am J Health-Syst Pharm.* 2013;70:195-283.

5.6 Tumor Board

Rationale

Pediatric malignancies are often treated with multiple modalities. Therefore, optimal care requires coordinated decision-making between pediatric medical oncologists, radiation oncologists, and children's surgeons. This decision-making is founded on correct diagnosis and staging requiring active engagement by pathologists and radiologists. Comprehensive planning of all aspects of diagnosis, staging and treatment are facilitated by discussion of patients in the tumor board conferences.

Different centers may structure these conferences differently depending on local factors such as case volume. The frequency of these meetings will vary by center but should be sufficient to allow timely discussion of children with cancer. Some centers may have separate tumor boards for specific diseases such as brain tumors, soft tissue and bone tumors, blastic tumors, hematologic malignancies and others. Surgical specialists only need to participate in tumor boards for diseases which they treat operatively. There may be specific tumors that are also discussed in disease specific tumor boards that coordinate the care of both pediatric and adult patients.

Definition and Requirements

All Levels

- All centers that provide oncologic operative care for pediatric patients must have a multidisciplinary clinical tumor board to facilitate review of diagnosis and staging as well as to coordinate therapeutic decision-making.
- Pediatric Disciplines which must participate in the tumor board include:
 - Surgical disciplines that provide care of oncology patients
 - Medical oncology
 - Radiation oncology
 - Pathology
 - Radiology
 - Non physician specialists are not required but if a need is identified then genetic professionals, clinical research professionals, palliative care providers, psychosocial providers should participate

Documentation

- Describe the multidisciplinary tumor board.

Resource

American College of Surgeons Commission on Cancer. *Optimal Resources for Cancer Care*. Available at: https://www.facs.org/-/media/files/quality-programs/cancer/coc/optimal_resources_for_cancer_care_2020_standards.ashx. Accessed April 14, 2021.

5.7 Perioperative Anesthesia Risk Assessment Program

Rationale

The Children's Surgery Verification Program endorses the development of perioperative anesthesia risk assessment programs (for example, Preoperative Clinics, Perioperative Care Coordination Clinics) to optimize the evaluation and perioperative management of children with complex medical conditions or who are undergoing extensive or complex surgeries. While inseparable from surgical decision-making, the perioperative anesthesia risk assessment is directed by anesthesiology to assure accurate assessment and mitigation of risk. The key features of risk assessment programs are to identify co-morbid conditions that may need to be treated preoperatively and/or require further evaluation prior to surgery. Examples include congenital cardiac disease, pulmonary disease, renal impairment, and complex congenital anomalies.

Definition and Requirements

Level I, Level I Specialty Musculoskeletal, and Level I Specialty Oncology

- A formal Perioperative Anesthesia Risk Assessment Program that systematically reviews all children with significant co-morbidities or undergoing complex surgery is required.
 - Requirements of a formal Perioperative Anesthesia Risk Assessment Program include:
 - › The Medical Director of Anesthesia (MDCA) is responsible for the oversight of the program but may assign another anesthesiologist to direct the program.
 - › Nursing or medical staff with the pediatric clinical skills required to take an appropriate medical and surgical history and determine whether further medical evaluation is needed.
 - › Formal intake process to assure that all patients scheduled for surgery undergo medical chart review and medical history review with parents or caregivers. This can be accomplished via survey instruments and/or phone interviews.
 - › An identifiable leader responsible for perioperative anesthesia risk assessment who oversees chart review and scheduling of in-person appointments and subspecialty appointments (when needed).

- › Establishment of specific guidelines for preoperative laboratory and diagnostic testing before surgery.
- › Mechanisms must be in place to provide appropriate preoperative education of patient and families and reinforce important guidelines such as preoperative NPO guidelines and preoperative medication administration
- › Availability of Anesthesia-trained pediatric personnel to evaluate patients and coordinate perioperative care.
- › Availability of behavioral health clinicians to assist in patient and family counseling and preparation for surgical procedures when needed (for example, patients with autism, severe anxiety, and so on).
- Required to engage in continuous review of day-of-surgery cancellations with specific review of cancellations and complications related to inadequate preoperative evaluation or preparation.
- Medical Director for affiliated ambulatory centers must also provide data specific to cancellations or complications related to appropriateness for Ambulatory care. These cancellations must be reviewed for appropriateness of ambulatory surgical use and any deviations must be reviewed at PIPS twice a year.

Level II and Level III

- Level II and III centers must have a formal mechanism for reviewing preoperative medical records and reaching out to families to identify medical co-morbidities before surgery.
- Mechanisms must be in place to provide preoperative education and preparation for children before surgery.
- Day of surgery cancellations and complications related to inadequate preoperative evaluation or preparation should be tracked (Level II).

See Standard 2.5 for specific Ambulatory Surgery Patients and Ambulatory Surgical Center requirements.

Documentation

All Levels

- Provide documentation of the organizational structure of the Perioperative Anesthesia Risk Assessment Program, including the number of preoperative evaluations and/or clinic visits.
- Provide examples of Perioperative Anesthesia Risk Assessment medical review and preparation documentation.
- Level I, II, and III centers must demonstrate evidence of educational materials and/or resources furnished to patients and families.

Level I, Level I Specialty Musculoskeletal, and Level I Specialty Oncology

- Level I centers must demonstrate evidence (and/or ongoing efforts) to use patient care data collected through the Perioperative Anesthesia Risk Assessment program for QI or research projects.

Level I, Level I Specialty Musculoskeletal, Level I Specialty Oncology, and Level II

- Level I and II centers must provide metrics of day-of-surgery OR case cancellations along with reason for cancellation (for example, recent illness or hospitalization, parent rescheduling, and so on).

Resource

American Academy of Pediatrics. Critical Elements for the Pediatric Perioperative Anesthesia Environment. Available at: <https://pediatrics.aappublications.org/content/pediatrics/136/6/1200.full.pdf>. Accessed April 14, 2021.

5.8–5.13 Patient Care: Expectations and Protocols—Electives

The Children's Surgery Verification Program recognizes that structured systems of care improve quality and patient satisfaction while decreasing cost. Multiple areas for this general approach can be identified and children's surgical centers may be at various points in development of these. The CSV Program is intended to foster this structured approach while allowing flexibility for each unique setting.

It is recognized that in some centers the protocols may take the form of programs with specific dedicated staff and physical space. In other centers, these functions may be contained within other care teams. The emphasis for assessment of these efforts will therefore be based on functionality and outcomes rather than a mandated organizational structure.

Level I Centers must utilize at least three of the six approaches delineated in Standards 5.8 through 5.13.

Level II Centers must utilize at least two of the six approaches delineated in Standards 5.8 through 5.13.

Level III Centers are encouraged to utilize these approaches but are not required to do so.

5.8 Acute Pain Management

Rationale

Treatment of pain associated with major surgery often requires the use of advanced pain management strategies such as neuraxial analgesia (epidurals and spinal opioids), peripheral nerve catheters, subcutaneous catheters, patient-controlled analgesia, ketamine infusions and other modalities that are managed by a dedicated Acute Pain Service. For many surgeries, these advanced techniques have become the standard of care and have led to not only improved pain control, but better outcomes related to reduced blood loss, improved pulmonary status and less chronic pain. Acute pain management services are most commonly led by anesthesiologists but there may be other physicians with advanced training in pain management who direct these services.

Definition and Requirements

Level I, Level I Specialty Musculoskeletal, and Level I Specialty Oncology

- Required to have an Acute Pain Management Process with the following core elements/activities:
 - Physician leader with expertise in acute pain management. This may be an anesthesiologist or another physician with special training in pain management.
 - Key personnel to provide 24/7 coverage to care for children requiring advanced pain management strategies in all areas of the hospital.
 - Development of guidelines for all advanced acute pain management strategies.
 - Development of standardized order sets for pain management modalities.
 - Engage in continuous monitoring of all pain management-related complications (for example, epidural hematoma, regional anesthesia complications or infections, and so on) and provide a summary to the PIPS Committee.
 - Be engaged in at least one data-driven quality improvement project to optimize postoperative pain management.

Level II

- All Level II centers that provide advanced pain management strategies such as continuous epidural analgesia, continuous peripheral nerve blockade, ketamine infusions, and so on must have the appropriate infrastructure to provide optimal care including:
 - 24/7 medical/nursing coverage to optimize analgesia and appropriately deal with complications
 - Guidelines for each pain management strategy
 - Standardized order sets for each pain management modality
 - Engagement in continuous monitoring of all pain management-related complications and provide a summary to the PIPS Committee

Documentation

- Describe the acute pain service process.
- Describe acute pain service guidelines for analgesic modalities.
- Show evidence of review of quality and safety report.
- Provide acute pain management standardized order sets for analgesic medications.
- Conduct on-site interviews.

Resource

American Academy of Pediatrics. Critical Elements for the Pediatric Perioperative Anesthesia Environment. Available at: <https://pediatrics.aappublications.org/content/pediatrics/136/6/1200.full.pdf>. Accessed April 14, 2021.

5.9 Clinical Protocols and Practice Guidelines

Rationale

Clinical protocols have been shown to improve care by reducing variability. Protocols should be developed by consensus among clinicians using the best available evidence. The use of the protocols increase safety by allowing caregivers to anticipate how patients will be managed and thereby decrease errors and improve efficiency. Practice guidelines and protocols also increase value by eliminating unnecessary diagnostic testing and avoiding more expensive but otherwise comparable medications. They also facilitate quality improvement efforts by creating a consistent baseline from which interventions can be evaluated.

Adoption of standardized protocols is facilitated by numerous national surgical specialty societies. These groups provide resources to aid centers new to clinical protocols in their development and implementation. Additionally, ACS NSQIP Pediatric facilitates knowledge sharing to encourage more rapid adoption of best practices. These resources help even lower volume centers offer care similar to higher volume centers.

Definition and Requirements

Level I, Level I Specialty Musculoskeletal, Level I Specialty Oncology, and Level II

- All surgical specialties must use clinical protocols to provide standardization of care for infants and children. The practice guidelines must include preoperative evaluation and preparation as well as postoperative care. Ideally this will include specific criteria for discharge and indicators for adjunctive studies as appropriate. At a minimum, each surgical specialty that provides care for children must have a clinical protocol for at least one condition and compliance must be monitored.
- The center must have a mechanism to assure that protocols are reviewed on periodic basis to assure that the protocols are based on best current evidence.

Documentation

- Describe the clinical protocols at the institution.
- Provide the policy/guideline for periodic review of clinical protocols.

5.10 Outpatient Coordination of Complex Care

Rationale

The Children's Surgery Verification Program endorses the use of multidisciplinary clinics (MDCs) to optimize the care and management of children with complex surgical conditions. A multidisciplinary (or multimodality) clinic is defined as a group of health care professionals who have cognitive and procedural expertise in different areas of care delivery and can efficiently manage complex medical and surgical conditions. Institutions providing optimal care for children have an obligation to provide MDCs for complex surgical conditions where care coordination and input from multiple specialties may improve care and the patient/family experience.

- **Physical space:** While MDCs typically function with all disciplines in a single space, this is not required (although desirable for efficiency). If a single space is not utilized the program should demonstrate that it provides efficient, patient-centered, coordinated multidisciplinary care.
- Required to engage in activities designed to increase and/or improve knowledge surrounding the MDC-focused disease process/condition. These include:
 - Community outreach to referring providers and/or patient care organizations pertaining to the disease/condition managed by the MDC, or benefits of the MDC program.
 - Collection of patient care data for the purpose of quality improvement or research.

Definition and Requirements

Level I, Level I Specialty Musculoskeletal, Level I Specialty Oncology, and Level II

- A formal MDC for at least three conditions and/or areas is required. Examples of diseases managed in these clinics include: congenital diaphragmatic hernia, short bowel and intestinal rehabilitation, myelomeningocele, prenatally diagnosed congenital anomalies, surgical oncology, complex aerodigestive conditions, inflammatory bowel disease, vascular anomalies.
 - **Personnel requirements** of a formal MDC include:
 - › Multidisciplinary care coordinator (or equivalent) to serve as the initial contact for patients and referring providers. The MDC coordinator educates both patients/families and referring providers on the disease process and intended function of the MDC, as well as the logistical considerations surrounding intake and clinic flow/throughput. The MDC coordinator also oversees scheduling, coordinated multidisciplinary review of patients, and maintains the patient flow templates.
 - › Multidisciplinary physicians (representing at least two separate specialties) that participate in direct patient contact through the MDC and formulate the collaborative management plan in a conference format.
 - › Representatives from support services based on individual patient needs (for example, nutrition, social work, and so on).

Documentation

Level I, Level I Specialty Musculoskeletal, Level I Specialty Oncology, and Level II

- Documentation of the MDC's organizational structure, including the number and names of participants across all relevant specialties, intake and follow-up care coordination protocol.
- Provide examples of MDC patient process maps (or equivalent documents) to illustrate how patients are managed through their respective appointments, tests, and follow-up care.
- Demonstrate evidence of educational materials and/or resources furnished to the community.
- Demonstrate ongoing efforts to use patient care data collected through the MDC for QI or research projects.

5.11 Specialized Nursing Protocols

Rationale

Specialized nursing refers to individualized assistance offered to patients, families, and caregivers to help overcome health care system barriers and facilitate timely access to quality physical and psychosocial health throughout the continuum of care. A specialized nursing process or team must be in place to guide patients and families undergoing complex surgical procedures. Nursing care for this population is provided by nurses with specialized knowledge and skills such as the placement and care for tracheostomy, enteric stomas, gastrostomy tube or other medical equipment. The complex needs of pediatric surgical patients and their families require specialized nursing knowledge and skills to achieve optimal patient care outcomes. Specialized nursing care should take on different forms in different communities as dictated by the needs of the patient, his or her family, and the community. This process includes consistent care coordination throughout the continuum of care and an assessment of the physical, psychological, and social needs of the patient. The anticipated results are enhanced patient outcomes, increased satisfaction, and reduced costs of care.

It is recognized that the structure of the specialized nursing protocols and teams may vary with the hospital organizational structures. The Children's Surgery Verification Program will therefore assess these programs based upon functions and outcomes rather than structure.

Definition and Requirements

Level I, Level I Specialty Musculoskeletal, Level I Specialty Oncology, and Level II

- Centers must demonstrate specialized nursing protocols for the comprehensive care of at least three surgical conditions.
- Characteristics of specialized nursing protocols and/or teams include:
 - Identifiable nurse leader with content expertise related to the specific disease
 - Development of specific nursing care protocols
 - Provision of educational resources which are disease and/or procedure specific
 - Coordinating services throughout the continuum of care
 - Connecting patients and families to resources and support services
 - Promoting communication between the patient and health care providers
- This process may involve different individuals at each point of care.

Documentation

- The center must provide documentation of a specialized nursing process or team to guide patients.
- Describe specialized nursing processes and/or team.
- Show evidence of use of these processes on chart review.

Resources

Global initiative aims to optimize care, safety for children with tracheostomies. Available at: <https://www.aapublications.org/news/2018/04/03/trach040318>. Accessed April 14, 2021.

Wound, Ostomy, and Continence Nurses Society. Available at: <https://www.wocn.org/>. Accessed April 14, 2021.

5.12 Palliative Care

Rationale

Palliative care is a patient and family-centered approach to medical and surgical treatment that is foundational for pediatric patients across the continuum of care and is essential at all levels of Children's Surgery Verification. Palliative care focuses on physical symptom relief while addressing the psychological, social, and spiritual discomfort of patients and families dealing with life-threatening or life-shortening diagnoses or conditions. Palliative care services must align with a patient and family's wishes and values and consider any religious or spiritual preferences of patients and their families.

It is recognized that the structure of the palliative care program may vary with the hospital organizational structures. The Children's Surgery Verification Program will therefore assess these programs based upon functions and outcomes rather than structure.

Definition and Requirements

Level I, Level I Specialty Musculoskeletal, Level I Specialty Oncology, and Level II

- Demonstrate palliative care services for appropriate patients. Palliative care services primarily focus on relieving pain and non-pain symptoms in patients with life-threatening or life-shortening illnesses. In addition to symptom relief, palliative care includes access to patient and family counseling and education, child life and social services intervention, music and art therapy, nutrition consultation, and respite care.
- Physicians, advanced practice providers, nurses, mental health professionals, social workers and spiritual counselors must participate in a patient's palliative care plan, when applicable.
- Characteristics of a palliative care program include:
 - Identifiable leader with content expertise related to palliative care
 - Multidisciplinary team-based planning and communication
 - Pain and non-pain symptom management
 - Education about prognosis and illness
 - Assistance with medical decision-making
 - Continuity of care across a range of clinical settings and services
 - Attention to spiritual needs and preferences
 - Psychosocial support for patients and families
 - Bereavement support for patients and families

Documentation

- Describe the palliative care protocols and guidelines at the institution, including process for ordering palliative care services for patients and care team members involved.
- Evidence of palliative care involvement in appropriate patients on chart review.
- Conduct on-site interviews.

Resources

Center to Advance Palliative Care. Pediatric Palliative Care Delivery. Available at: <https://www.capc.org/toolkits/designing-a-pediatric-palliative-care-program/>. Accessed April 14, 2021.

Cox CE, Curtiss JR. Using technology to create a more humanistic approach to integrating PC into the intensive care unit. *Am J Respir Crit Care Med*. 2016;193(3):242-250. PMID:26599829

Dalai S, Bruera S, Hui D, Yennu S, Dev R, Williams J, et al. *The Oncologist*. 2016;21(1):110-118. PMID:26614711

Gorman RD. Integrating PC into primary care. *Nurs Clin N Am*. 2016;51(3):367-379. PMID:27497014

Hughes MT, Smith J. The growth of PC in the United States. *Annu Rev Public Health*. 2014;35:459-475. PMID:24641562

5.13 Enhanced Recovery After Surgery (ERAS) Protocols

Rationale

Enhanced Recovery After Surgery (ERAS) protocols were initiated in the late 1990's for adult surgical patients to hasten the return of bowel function and enhance functional recovery. These multidisciplinary protocols have subsequently been shown to improve overall outcomes after abdominal surgery, gyn-oncology, thoracic, spine, craniofacial, hepatobiliary, and urologic surgery. The focus of these protocols is to minimize the stress response, decrease trauma and inflammation, and reduce complications. Improvements in other surgical outcomes follow. Multiple studies in adults have demonstrated decreased hospital length of stay, in-hospital costs and postoperative complications, and improved patient satisfaction. Though the literature is less abundant in pediatric surgical populations, preliminary studies suggest that the application of these protocols in pediatric patients is safe and effective. ERAS protocols coordinate care between anesthesiologists, surgeons, perioperative nursing staff, and others, and include elements in all areas of perioperative care including aspects of preoperative, intraoperative, and postoperative management. These include pre-admission counseling, optimization of medical conditions, absence of prolonged fasting, early mobilization, early oral nutrition, and multimodal analgesia.

Definition and Requirements

The Children's Surgery Verification Program supports the development of ERAS protocols to optimize surgical care for children. These programs require robust multidisciplinary coordination and education throughout the perioperative period among surgeons, anesthesiologists, nurses, and all others involved in perioperative care. Successful ERAS programs rely on pre-admission counseling early in the process in order to optimize medical management of comorbidities and educate and engage patients and families about what to expect in the perioperative period, especially regarding early mobilization and feeding. Ongoing and repetitive patient, family, and staff education, an emphasis on protocol compliance, and regular audits and team meetings using Quality Improvement tools to evaluate and adjust local protocol applications are essential in creating a successful ERAS program.

Level I, Level I Specialty Musculoskeletal, Level I Specialty Oncology, and Level II

Required to have a standardized process for the development of ERAS protocols throughout the institution that include:

- Multidisciplinary team(s) with leaders from any surgical specialty, anesthesiology, and nursing to oversee the development and assessment of ERAS protocols
- Creation of standardized order sets for perioperative care based on ERAS principles
- Engagement in continuous monitoring of outcomes and surgical complications related to ERAS protocols
- Regular measurement and evaluation of ERAS protocol elements to determine safety and effectiveness
- Engage in at least one data-driven quality improvement project annually to evaluate and optimize the elements of ERAS protocols

Documentation

- Provide roster of ERAS leadership team.
- Provide examples of ERAS protocols.
- Provide metrics of compliance with ERAS protocols.
- Conduct on-site interviews with ERAS leaders.

Resources

ERAS Society. Available at: <https://erassociety.org/>. Accessed April 14, 2021.

Leeds IL, Boss EF, George JA, Strockbine V, Wick EC, Jelin EB. Preparing enhanced recovery after surgery for implementation in pediatric populations. *J Pediatr Surg*. 2016 Dec; 51(12): 2126-2129. PMID: 27663124

Short HL, Taylor N, Thakore M, et al. A survey of pediatric surgeons' practices with enhanced recovery after children's surgery. *J Pediatr Surg*. 2018 Mar;53(3):418-430. PMID: 28655398

Vacek J, Davis T, Many BT, et al. A baseline assessment of enhanced recovery protocol implementation at pediatric surgery practices performing inflammatory bowel disease operations. *J Pediatr Surg*. 2020;55:1996-2006.

Zamorra IJ, Ghani MO, and Heiss KF. Pediatric Enhanced Recovery After Surgery (ERAS): The Next Generation of Peri-operative Quality Improvement and Innovation. *Fundamentals of Pediatric Surgery [Mattei]*.



AMERICAN COLLEGE OF SURGEONS
CHILDREN'S SURGERY VERIFICATION QUALITY IMPROVEMENT PROGRAM

6 Data Surveillance and Systems

6.1 ACS NSQIP Pediatric

Rationale

The ACS NSQIP Pediatric is a program that is closely aligned with the Children's Surgery Verification Program. The ACS NSQIP Pediatric is the first comprehensive, risk-adjusted, 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, etc.), 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 detect significant differences in mortality among hospitals.

Experience with the adult ACS NSQIP program, which has been in existence for approximately 20 years, has demonstrated that program participation 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 data have shown that the baseline incidence of these events has progressively declined after implementation of the program.

Historically, the program has focused on measuring universal events such as infections, renal failure, and pulmonary complications. The ACS NSQIP Pediatric is evolving to examine risk factors and 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 Data Committee, which is composed of leaders in children's surgery and an experienced staff of investigators and statisticians. Participation in the ACS NSQIP Pediatric and active use of the information is expected to create a culture that broadly improves care in patients undergoing surgical procedures at the institution.

Definition and Requirements

Level I, Level I Specialty Musculoskeletal, and Level II

- Children's surgical centers must participate in the American College of Surgeons National Quality Improvement Program Pediatric (ACS NSQIP Pediatric) and have abstracted at least six months of data prior to beginning the Children's Surgery Verification Pre-Review Questionnaire.
- Unadjusted reports are available to all centers via the ACS NSQIP Pediatric Registry. Reports from the registry provide site-specific data for participating centers. Online reports must be collaboratively reviewed, at least quarterly, by the Children's Surgery Leadership team identify, trend, and address issues specific to surgical care. Metrics to review include, but are not limited to:
 - CPR during Operation
 - Unplanned Extubation
 - Coma > 24 Hours
 - Cerebral Vascular Accident/Stroke or Intracranial Hemorrhage
 - Seizure
 - Cardiac arrest requiring CPR
 - Venous thrombosis requiring therapy
 - Blood transfusion
 - Unplanned intubation
 - 30- Day Unplanned Readmission
 - 30-Day Unplanned Return to OR
- Institutions must review the program's quality performance metrics compared with national benchmarks and develop plans to address any trends reflecting poor performance. Plans may include tracking and trending data over time, and may not necessarily prompt a quality improvement project, unless indicated.
- Institutions must review the program's Semi-Annual Report and develop plans to address any data trends reflecting poor performance.
- The surgical center's Children's Surgery Program Manager (CSPM) and Medical Director of Children's Surgery (MDCS) or designee are required to review all institution-specific and national aggregate data and distribute the data to the PIPS Committee for review.
- The ACS NSQIP data collected 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.

***For Level I Specialty Oncology Centers:** Participation in the American College of Surgeons National Quality Improvement Program Pediatric (ACS NSQIP Pediatric) is required once a relevant procedure specific module has been developed. At present best available risk-adjusted peer-comparable data must be used for quality improvement. The above requirements must be met if Level I Specialty Oncology Centers currently participate in ACS NSQIP Pediatric.

Documentation

- Centers must have the most recent ACS NSQIP Pediatric Semiannual Report (SAR) available for review onsite.
- Centers must describe how ACS NSQIP data are disseminated to all specialties.
- Centers must demonstrate how ACS NSQIP data are tracked.
- Centers must provide a list of all quality improvement projects that have derived from the ACS NSQIP Pediatric data.
- The assigned Children's Surgery Verification site visit surveyors will interview the institution's Surgical Clinical Reviewer (SCR) about adherence to the ACS NSQIP Pediatric sampling algorithm.

Resources

Hoyt DB, Ko CY. *Optimal Resources for Surgical Quality and Safety*. Chicago, IL: American College of Surgeons; 2017.

Saito JM, Chen LE, Hall BL, et al. Risk-adjusted hospital outcomes for children's surgery. *Pediatrics*. 2013;132(3): e677-688.

6.2 Children's Surgery Safety Report (Appendix I)

Rationale

The ability to collect, analyze, and understand safety data is a critical component of providing high-quality care and improving patient outcomes. For any institution committed to addressing areas of weakness, the first step must be to accurately characterize performance through robust and reliable data measurement. It is imperative that every verified children's surgical center accurately track and report all the major adverse events that occur in surgical patients younger than 18 years in the center and address them in a coordinated systematic manner within a culture of improvement and prevention.

Definition and Requirements

The safety events to be monitored in all surgical patients younger than 18 years are detailed in Appendix I. 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 application. All levels of verified children's surgical centers will be expected to develop detection and reporting processes for these events and to articulate them for the ACS verification team at the time of the site visit. Doing so will allow a better understanding of the strengths, limitations, and costs of detection methods so that detection may be improved as the program evolves. Institutions must also have a process that ensures program staff are adequately trained and monitored to capture high quality Appendix I data. Data must be reviewed at least quarterly by PIPS to identify, trend, and address issues specific to children's surgical care.

All Levels

- Centers must develop a process to identify all safety events occurring in surgical patients. These specific events are outlined in Appendix I.
- Major safety events listed in Appendix I must be tracked and trended to identify any systemic issues within the surgical program. Many of these events are identified by the patient safety department or within the quality structure of the hospital. The center needs to develop a process so that any of these events involving surgical patients are shared with the Children's Surgery Leadership team in a timely fashion. The Root Cause Analysis (RCA) group or hospital wide Quality Services must present all surgery related RCAs with the Children's Surgery Leadership team.

- Monitoring events listed in Appendix I must be tracked to identify any systemic issues within the surgical program. These events may be defined and identified by Children's Hospitals' Solutions for Patient Safety and other programs, or other national quality and safety programs. The center needs to develop a process so that any of these events involving surgical patients will be reported to the Children's Surgery Program Manager. A process must be developed to identify and track events that are not identified by other quality and safety programs.
- Anesthesia related events listed in Appendix I must be tracked and trended to identify any system issues within the surgical program. These events should be captured by the anesthesia team. A report of these events must be forwarded to the MDCA. The MDCA, or designee, and the CSPM should partner in the review of these events.
- Centers should consider creating a surgery safety dashboard to address recurring trends of Appendix I events so that opportunities for improvement can be identified and action plans to reduce the risk of recurrence be created.
- The Children's Surgery Program Manager (CSPM) Medical Director of Children's Surgery (MDCS), and Medical Director of Anesthesia (MDCA) are required to review Appendix I data and distribute the data to the PIPS Committee for review at least quarterly.
- Identified systems issues that are identified must have documented corrective strategies.

Documentation

- Describe how Appendix I data are collected and describe the data sources.
- Describe the Appendix I data review process.
- Describe the associated surveillance methods and protocols for the safety data.
- Describe the personnel involved in collecting Appendix I data and the process for training and monitoring data collection personnel.
- Provide a list of all quality/process improvement projects that have derived from the collection of Appendix I data.
- Completed Appendix I from the children's surgical center's Pre-Review Questionnaire (PRQ).

6.3 Data Management and Electronic Resources

Rationale

The relationships of the medical center's electronic medical record and other data-collection systems continue 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, and other databases be as accurate as possible.

Definition and Requirements

All Levels

- Children's surgical centers must be actively engaged in using the electronic resources within the institution to optimize the accuracy of data capture and efficiency of collection.
- Children's surgical centers must provide adequate data management resources for data capture and demonstrate commitment to sharing of relevant data across quality departments/teams.
- Excluding peer review data, the Children's Surgery Program Manager (CSPM) must have access to capture all summary data and significant event data related to surgical patients.

Documentation

- Institutions must provide a chart or process map demonstrating the program's available data resources and flow of electronic information to children's surgical center staff for quality improvement purposes and indicating key data collection personnel.
- Institutions are encouraged to provide any relevant policies or protocols related to children's surgical staff access to data resources.
- Children's surgical centers must provide documentation of any relevant fail points regarding the institution's data collection process.
- Institutions are expected to describe the defined data collection process and provide concrete examples of the data collection process's effectiveness.

Resource

Hoyt DB, Ko CY. *Optimal Resources for Surgical Quality and Safety*. Chicago, IL: American College of Surgeons; 2017.



AMERICAN COLLEGE OF SURGEONS
CHILDREN'S SURGERY VERIFICATION QUALITY IMPROVEMENT PROGRAM

7 Quality Improvement

7.1 Hospital Integration

Rationale

A children's surgery PIPS program is an essential component of a high-quality clinical surgical program. The ACS Children's Surgery Verification Program requires a structured effort that is integrated into the hospital's quality improvement and safety programs.

Key to the excellence we seek is healthy surgical services culture; often referred to as safety culture. It facilitates improvements across many domains beyond safety and promotes high functioning teams. It includes elements of respect, flattening power gradients, personal safety for team members to raise concerns and voluntarily report events, transparency, disclosure, and intolerance of disruptive behavior among teammates.

Definition and Requirements

Children's surgery centers must have a process to monitor, evaluate, and improve the performance of their surgical programs. A standardized approach minimizes unnecessary variation, allows better outcome assessment, and makes care modifications easier to implement. Coordination of the children's surgery PIPS program into hospital-wide PIPS efforts may reduce labor while producing greater impacts on quality.

All Levels

- A structured effort that is integrated into the hospital's quality improvement and safety programs and that demonstrates a continuous process for improving care for children with surgical needs is required. That integration must include regular reporting to the hospital governing quality committee (or equivalent).
- This structure must ensure all quality and safety events that occur at the institution and involve surgical patients in the perioperative period are promptly reported to surgical leadership
- The integration of hospital quality improvement and safety structures with the surgical PIPS must be demonstrable by bidirectional sharing of expertise and data.
- Discussion and meeting minutes during multidisciplinary review activities shall be a confidential quality improvement activity that is protected by all pertinent state and federal statutes.

- Learnings or opportunities for improvement developed from the surgical PIPS Committee deliberations shall be demonstrably disseminated to all appropriate participants in the care of patients in the Children's Surgery Center, to hospital quality improvement and safety officials, and to the appropriate hospital governing quality committee (or equivalent).
- Quality of care or safety concerns may be evaluated initially by individual specialties within their usual departmental or divisional morbidity and mortality (M and M) or PIPS review structures. However, identified problem trends must undergo multidisciplinary case review by a dedicated children's surgical quality improvement review PIPS Committee.
- Periodic safety culture survey (or equivalent) must be completed every two years. These surveys may be distributed at the institution level, but the survey must be inclusive of perioperative services. The results from the perioperative services must be reviewed by the PIPS Committee and improvement plans developed for areas of concern.

Documentation

- Hospital quality and safety organizational chart showing flow of surgical quality and safety reports and hospital-wide quality improvement reports.
- Minutes of Board of Trustees Quality and Safety Committee (or equivalent) demonstrating regular reporting of surgical quality improvement data and plans.

Resource

Hoyt DB, Ko CY. *Optimal Resources for Surgical Quality and Safety*. Chicago, IL: American College of Surgeons; 2017.

7.2 Surgery PIPS Committee Structure

Rationale

The children's surgery PIPS program must demonstrate a continuous process for improving care for children with surgical needs at all levels of verification.

Definition and Requirements

Performance improvement emphasizes a continuous, multidisciplinary effort to measure, evaluate, and improve patient safety.

All Levels

- A multidisciplinary children's surgery PIPS Committee must be chaired or co-chaired by the MDCS or designee.
- The meetings of the full PIPS Committee must be frequent enough to ensure timely review of children's surgical care, but they must be at least quarterly. Subcommittees of the PIPS Committee may be constituted to meet more frequently to screen data and to determine, using pre-defined institution-specific criteria, which quality improvement and safety data warrants discussion with the PIPS Committee at large.
- In-person meetings are preferred; however, virtual meetings are an acceptable alternative to in-person meetings when necessary.
- Surgical PIPS Committee participation must include representatives from pediatric anesthesiology, pediatric radiology (including interventional radiology), all children's surgical specialties and medical procedural specialties (including but not limited to: pediatric cardiology, pediatric gastroenterology, pediatric pulmonology, and pediatric hematology oncology) as well as hospital administration, nursing, neonatology, critical care medicine, and pediatric emergency medicine, if within the scope of practice.
- Hospital quality improvement and safety staff and leaders must participate in PIPS meetings.
- Members or designees must attend at least 50 percent of the PIPS meetings, except for medical specialties whose representatives must attend only when agenda items pertinent to their respective specialties are discussed.

Level III

- Children's surgeons and anesthesiologists with pediatric expertise are required to participate in children's quality and safety activities.

Documentation

- Provide MDCS CV.
- Provide minutes of any PIPS subcommittees.
- Provide PIPS minutes with attendance records.
- Provide PRQ Surgical Program Leadership and PIPS Committee table.
- Provide schedule of PIPS meetings during the review period.
- Site must be able to demonstrate the same efficiency and work product from virtual meetings. This will be assessed onsite, and PIPS meeting minutes will be reviewed.

Resources

American College of Surgeons Children's Surgery Verification Quality Improvement Program. *Optimal Resources for Children's Surgical Care v.1*. Available at: <https://www.facs.org/quality-programs/childrens-surgery/childrens-surgery-verification/standards>. Accessed April 13, 2021.

Hoyt DB, Ko CY. *Optimal Resources for Surgical Quality and Safety*. Chicago, IL: American College of Surgeons; 2017.

	Surgery PIPS Participation				
	Level I	Level I Specialty Musculoskeletal	Level I Specialty Oncology	Level II	Level III
MDCS	X	X	X	X	X
Pediatric General Surgery (if not MDCS)	X	X	X	X	X
MDCA	X	X	X	X	X
Pediatric Anesthesia (if not MDCA)	X	X	X	X	X
CSPM	X	X	X	X	X
ACS NSQIP Pediatric Surgeon Champion	R	R	R	R	R
ACS NSQIP Pediatric SCR	R	R	R	R	R
Pediatric Radiology	X	X	X	X	X
Interventional Radiology	A	A	A	A	A
Pediatric Orthopedic Surgery	X	X	X	X	X
Pediatric Neurosurgery	X	X	X	X	X
Pediatric Urology	X	X	X	X	X
Pediatric Plastic Surgery	X	N/A	X	X	X
Gynecology	A	A	A	A	A
Pediatric Ophthalmology	X	N/A	X	X	X
Pediatric Cardiology*	A	X	X	A	A
Congenital Heart Surgery*	X	A	A	R	R
Pediatric Otolaryngology	X	N/A	X	X	X
Neonatology**	X	N/A	N/A	X	X
Critical Care Medicine**	X	X	X	X	X
Pediatric Gastroenterology	A	A	A	A	A
Pediatric Pulmonology	A	A	A	A	A
Pediatric Dermatology	A	A	A	A	A
Pediatric Hematology/Oncology	A	N/A	X	A	A
Pediatric Emergency Medicine	X	X	X	X	X
Transport	R	R	R	R	R
Hospital QI Resource	X	X	X	X	X
Surgical Advanced Practice Provider	A	A	A	A	R
Nursing	X	X	X	X	X
Hospital Administration	X	X	X	X	X
Physical Medicine and Rehabilitation	N/A	X	N/A	N/A	N/A
Pediatric Radiation Oncology	N/A	N/A	X	N/A	N/A

X = Mandatory when specialty service provided, > 50 percent attendance

R = Recommended

A = Ad hoc as needed per topic discussion

*Cardiology is required if congenital heart surgery is not within the scope of the services provided

**Neonatology and critical care medicine are required if within the scope of services provided

7.3 PIPS Committee Responsibility

Rationale

The children's surgery PIPS program is responsible for monitoring, evaluating, and improving the performance of a children's surgical program. A major objective of PIPS is to reduce inappropriate variation in care and to improve patient safety.

Definition and Requirements

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 multidisciplinary 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 (M and M) or PIPS review structures. Patient safety is a core focus of the PIPS process and underscores an important goal of the children's surgical program.

All Levels

- The children's surgery program PIPS Committee must have specific written criteria that define which quality and/or safety concerns identified via departmental or specialty divisional M and M should be reviewed by the PIPS Committee. These criteria should focus particularly on any system issues, issues related to two or more disciplines, and serious safety events related to deviations from standards of care.
- The Quality Improvement and Patient Safety process must define, in writing, conditions and circumstances requiring the physical presence of a provider within 60 minutes. Please review Standards 4.1 and 4.3 for further details.
- When a consistent problem or inappropriate variation is identified, corrective action must be taken and documented.

Levels I, Level I Specialty Musculoskeletal, and Level I Specialty Oncology, and Level II

- The PIPS Committee shall review their own institution specific ACS NSQIP Pediatric data at least semi-annually and identify any potential quality improvement activities based on changes or trends of concern in their morbidity and mortality data, or negative outlier status. At least one ACS NSQIP Pediatric data-derived quality improvement project should always be active and status reports on that work will be given to the PIPS Committee at least semi-annually. See Standard 7.6: Quality Improvement Projects for more information.

- Patient care may be evaluated initially by individual specialties within their usual departmental or specialty division morbidity and mortality or quality review structures; however, identified problem trends must undergo a multidisciplinary review by a dedicated children's surgical review committee at Level I and II centers.

Level III

- Patient care may be evaluated initially by individual specialties within their usual departmental or specialty division morbidity and mortality or quality review structures; however, identified problem trends must undergo a multidisciplinary review by a dedicated children's surgical review committee. This function may be integrated into existing institution-wide processes for Level III centers.

Documentation

- PIPS Committee or subcommittee minutes to demonstrate review of all morbidity and mortality (M and M) reports from surgical and applicable medical specialties.
- Written PIPS policies that define which types of M and M cases shall be reviewed by the PIPS Committee.
- Written PIPS policies or medical staff policies that define the requirements for physical presence of a staff provider within 60 minutes.
- PIPS minutes that demonstrate review of institution specific ACS NSQIP Pediatric or national database data.
- PIPS minutes that demonstrate quality improvement activities derived from institution specific ACS NSQIP Pediatric data analysis.

Resources

American College of Surgeons Children's Surgery Verification Quality Improvement Program. *Optimal Resources for Children's Surgical Care v.1*. Available at: <https://www.facs.org/quality-programs/childrens-surgery/childrens-surgery-verification/standards>. Accessed April 13, 2021.

Hoyt DB, Ko CY. *Optimal Resources for Surgical Quality and Safety*. Chicago, IL: American College of Surgeons; 2017.

7.4 Mortality and Serious Safety Event Review

Rationale

Clinical outcomes, as well as outcomes that reflect the patient and/or family perspective, are fundamental to a children's surgical program. The children's surgery PIPS program must review outcome measures to assess quality of patient care.

Definition and Requirements

One key purpose of a multidisciplinary case review process is to improve surgical care by reviewing all deaths and serious safety events with the objective of identifying issues and developing appropriate responses.

All Levels

- The PIPS Committee, or a subcommittee thereof, will improve surgical care by reviewing all postoperative deaths (in other words, within 30 days of a procedure under general anesthesia), selected complications, all serious safety events, and any state or nationally required reportable hospital-acquired conditions (HAC) occurring in surgical patients.
- All deaths of infants and children within 30 days of a procedure under general anesthesia must be systematically reviewed and categorized by PIPS or its subcommittees by applying criteria defined in advance by the PIPS Committee. Mortalities could be categorized by unanticipated mortality with opportunity for improvement, unanticipated mortality without opportunity for improvement, anticipated mortality with opportunity for improvement, or anticipated mortality without opportunity for improvement. These criteria for discussion of mortality at PIPS should focus on: (1) identified opportunities for improvement, (2) system issues that might have impacted outcome, (3) involvement of two or more disciplines in the surgical care, and (4) serious safety events stemming from a deviation in the standard of care. Other criteria should also be applied depending on the hospital's surgical volume, with the goal of reducing unexpected or potentially avoidable mortality.

Documentation

- Minutes of PIPS or PIPS subcommittee identifying morbidities, mortalities, HAC, and serious safety events among surgical patients and review of their care.

Resources

American College of Surgeons Children's Surgery Verification Quality Improvement Program. *Optimal Resources for Children's Surgical Care v.1*. Available at: <https://www.facs.org/quality-programs/childrens-surgery/childrens-surgery-verification/standards>. Accessed April 13, 2021.

Hoyt DB, Ko CY. *Optimal Resources for Surgical Quality and Safety*. Chicago, IL: American College of Surgeons; 2017.

7.5 PIPS and Data Review

Rationale

The Children's Surgery Verification Program endorses continuous collection and multidisciplinary review of all local and national data, as well as sentinel perioperative events occurring at the children's surgical center. Institutions providing optimal care for children have an obligation to participate in the collection of surgical safety events, to provide adequate data collection staffing and electronic resources, and to distribute these data to appropriate program staff in order to improve the surgical care of children.

Definition and Requirements

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. The children's surgery 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.

All Levels

- The PIPS Committee must evaluate and monitor the availability of children's specialty OR personnel, the timeliness of starting operations, and measures implemented as required to ensure bedside response times that yield optimal care.
- The PIPS process must systematically monitor compliance with response times and physical presence and outcomes when a non-pediatric specialist provides call coverage.
- The PIPS Committee, or subcommittee thereof, will review Appendix I data at least semi-annually to identify any trends that warrant more detailed review, and to screen for any serious safety events that might represent a deviation from standard of care.
- All PIPS quality reviews of Appendix I data will apply criteria, defined in advance by the PIPS Committee, to determine which events require discussion with the PIPS Committee at large to improve quality and safety.

- The PIPS Committee shall utilize a team approach to develop and continuously monitor, documented quality improvement activity related to ACS NSQIP Pediatric or Appendix I data as well as at least one of these four domains: (1) quality improvement activities arising from specialty-derived M and M reviews, (2) serious safety events affecting surgical patients, (3) transport-related issues, and (4) PIPS monitored performance data (for example, surgeon response times, timeliness of surgical care, etc. See below for a detailed list of PIPS items to monitor and review.
- Children's surgical center must be able to demonstrate that specific patient population processes or systems trends can be identified for review. The children's surgical center's PIPS process must be able to review the care of patients across multiple disciplines and access the results of those disciplines' PIPS processes.

Documentation

- PIPS minutes demonstrating review of timeliness of surgical care for emergency conditions.
- PIPS or PIPS subcommittee minutes demonstrating review of Appendix I data and their trends.
- PIPS or PIPS subcommittee minutes demonstrating review of serious safety events impacting surgical patients.
- PIPS minutes showing which quality improvement activities are monitored by surgical PIPS, how often they are reviewed, and for how long.
- Institutions must provide documentation of patient population or systems issues review as evidenced by multidisciplinary surgical case review meeting minutes.

Resource

Hoyt DB, Ko CY. *Optimal Resources for Surgical Quality and Safety*. Chicago, IL: American College of Surgeons; 2017.

PIPS Performance Data	PIPS Committee*	PIPS Committee or subcommittee**	QI Personnel***
Review Item			
Monitor pediatric rapid response and/or resuscitation team activities			X
Monitor credentials and scope of practice for all providers			X
Ensure call schedules are readily available			X
Document ICU surgeon engagement and responsibility for medical appropriateness		X	X
Monitor PICU pediatric intensivist availability			X
Monitor physical availability of radiologists with hands-on imaging capability within 60 minutes 24/7			X
Monitor IR availability			X
Monitor surgeons' participation in care of patients specific to their field		X	
Monitor transfer guidelines for ambulatory surgery patients			X
Monitor availability of appropriate pediatric anesthesia services and the absence of delays in airway control or operations		X	X
Review absence of delays for PACU availability requirement when met by on call team from outside the hospital			X
Monitor changes between preliminary and final interpretation of images			X
Document appropriate timeliness of arrival for pediatric-trained radiology technologists and relevant others responding from outside the hospital			X
Monitor medical/surgical specialist provisions and availability		X	X
Internal review of alternative pathway providers' volume and quality of pediatric care		X	X
All cases where time to OR < 60 minutes is required for life-threatening conditions (100 percent capture). Any cases >60 minutes from booking to incision would need to be reviewed. 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). 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.		X	X
Review and discuss Semi-Annual ACS NSQIP Pediatric report	X		
Review and discuss all multidisciplinary or system issues that warrant QI activity	X		
Review and discuss all Serious Safety Events identified via hospital QI activity that might impact the care of surgical patients	X		
Review and discuss all issues referred by any PIPS subcommittee or hospital QI personnel for multidisciplinary action	X		

* Must be reviewed by the PIPS Committee at least annually.

** All items are required to be monitored. Any items that fall out of compliance must be reviewed by the PIPS Committee.

*** All items are required to be monitored. Any items that fall out of compliance must be reviewed by QI Personnel with the CSPM and MDCS, if not the PIPS Committee

7.6 Quality Improvement Projects

Rationale

Modern PIPS work in surgical care is a continuous cycle of monitoring, assessment, and management. Institutions must be able to demonstrate that quality improvement projects have been sustained or that there is a plan in place for sustainability.

Definition and Requirements

All Levels

- Quality improvement projects developed and monitored by PIPS must have pre-determined follow-up, including what data will be monitored, at what intervals, and for what duration, to adequately assure whether quality improvement progress has been sustained.
- Institutions will demonstrate ongoing quality improvement projects that derive directly from the analysis of collected data. Institutions will demonstrate that these projects or improvements have been sustained or that there is an established plan for sustainability. Review Chapter 6: Data Surveillance and Systems for data requirements.

Documentation

- PIPS minutes demonstrating on-going monitoring of quality improvement projects.
- Brief description of active quality improvement projects including current status.
- Institutions will describe how quality improvement projects are approved at the surgical center, disseminated to surgical/medical staff, and implemented into the center's daily operations.
- QI Project table.

Resource

Hoyt DB, Ko CY. *Optimal Resources for Surgical Quality and Safety*. Chicago, IL: American College of Surgeons; 2017.

7.7 Transport and Transfer Review

Rationale

The children's surgery PIPS program must review transports for performance improvement. Performance improvement entails demonstrating that a corrective action has the desired effect as determined by continuous evaluation.

Definition and Requirements

Appropriate feedback (loop closure) should be provided where there are opportunities for education and/or improvement following transfers of care. This is best done by a senior medical leader such as CMO, Surgeon-in-Chief, or a similar counterpart at the referring institution. A mechanism to provide feedback to referring institutions must be established. A process should be in place to screen surgical transport activities for any quality or safety issues. Any issues that are identified that are unique to the patient or transferring institution should have feedback provided as detailed above. Any quality or safety issues that represent a trend or system issue should be escalated to the PIPS Committee for review. Feedback from the PIPS discussion should be provided to the Director of Transport Services and to the referring institution.

All Levels

- The PIPS Committee must review all transfers/transports out to a higher level of care for appropriateness, timeliness, and outcome.
- Transfer/transport of patients from other institutions for surgical care at a Children's Surgery Center must be reviewed. Any quality or safety issues related to transfers/transports must be reviewed by the PIPS Committee or a multidisciplinary subcommittee thereof. Those issues identified as serious must be discussed by the PIPS Committee at large.
- The complement of personnel, mode of transport/transfer, and medical control policies will vary by location, but performance must be monitored by PIPS.

Documentation

- Minutes of transport/transfer reviews by PIPS or another committee.
- Minutes showing PIPS review of any transport/transfer quality issues and any transfers/transports out to another center for surgical care.
- Detail the process by which feedback for surgical patients is obtained and delivered to the referring hospital.

Resource

American College of Surgeons Children's Surgery Verification Quality Improvement Program. *Optimal Resources for Children's Surgical Care v.1*. Available at: <https://www.facs.org/quality-programs/childrens-surgery/childrens-surgery-verification/standards>. Accessed April 13, 2021.



AMERICAN COLLEGE OF SURGEONS
CHILDREN'S SURGERY VERIFICATION QUALITY IMPROVEMENT PROGRAM

8 Education: Professional and Community Outreach

8.1 Children's Surgery Education, Outreach, and Scholarly Activities

Rationale

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 health leadership. 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. A good outreach program allows the verified center to serve as a regional resource for the benefit of patients and providers.

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 providing relevant residency and fellowship training programs is highly desirable within a children's health care system but is not required for ACS CSV verification. Ongoing educational programs in various aspects of children's surgical care must be offered to practicing physicians, nurses and pre-hospital providers and allied health providers in all Level I children's surgery centers.

The ACS recognizes that residency programs provide service to surgical centers, but the educational experience should be the prime focus. 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 introduced to the surgical services and meet the Accreditation Council for Graduate Medical Education (ACGME) educational requirements for their respective programs.

Definition and Requirements

Level I, Level I Specialty Musculoskeletal, and Level I Specialty Oncology

- Of the three following categories and related activities, the specified number must be demonstrated from each category:
 1. **Leader of a system (all four required)**
 - a. The children's surgical center must be a regional leader in children's surgical education and outreach activities for all physicians, as evidenced by continued medical education offerings to regional practitioners that promote optimal surgical care of children.
 - b. The children's surgical center must engage in children's surgical education for the non-medical public as evidenced by pediatric-specific outreach activities, public service awareness events, and dissemination of new information to the public (for example, issues related to anesthesia in young children, children's surgery during a pandemic or mass casualty event).
 - c. The children's surgical center must provide a means to facilitate referral and access to children's surgical center resources through relationships with local and regional hospitals that form a system of care.
 - d. The children's surgical center must provide a mechanism to offer relevant children's surgical education to nurses and other allied health professionals who are part of the care of children's surgical problems at local and regional hospitals.
 2. **Creation dissemination, and/or implementation of new medical and surgical knowledge (two of four required):**
 - a. The children's surgical center must provide 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 that are related to children's surgical care, participation in writing questions for or giving physician certification exams, or demonstrable similar work.
 - b. The children's surgical center must provide evidence of peer-reviewed funding for related research. There should be demonstrated evidence of funding of the center from a recognized government, intramural, or extramural private agency or organization.

- c. The children's surgical center must provide evidence of creation or dissemination of multidisciplinary clinical-based knowledge as evidenced by three of the following five examples over the past three years: (1) creation of clinical pathways or other contributions to PI (for example, APSA toolbox or others); (2) publication of case reports, review articles, book chapters, technical documents, Web-based publications, editorial comments, or presentation at a national or international meeting; (3) participation in regional or national surgery quality improvement initiatives; (4) participation in collaboratives (for example, Midwest Pediatric Surgery Research Consortium, Pediatric Surgery Research Collaborative, Pediatric Surgery Quality Collaborative); (5) creation or dissemination of training manuals or related course material or other educational materials that contribute to the practice of children's surgery to local or regional hospitals.
- d. The children's surgical center must have 20 peer-reviewed articles published in journals in PubMed in the most recent three-year period. The 20 publications must result from work related to the surgical services of the applicant center. Of the 20 publications, at least one must be authored or co-authored by members of the general pediatric surgery team or lead surgical specialty for Level I Specialty hospitals (pediatric musculoskeletal surgery team or pediatric surgical oncology team). Additionally, at least one article each from three of the following disciplines is required: (1) basic sciences, (2) pediatric neurosurgery, (3) pediatric emergency medicine, (4) pediatric orthopaedics, (5) pediatric radiology, (6) pediatric anesthesia, (7) vascular surgery, (8) pediatric plastics/maxillofacial surgery, (9) pediatric critical care, (10) congenital heart surgery, (11) pediatric rehabilitation, (12) nursing, (13) pediatric urology, (14) pediatric otolaryngology, and (15) pediatric ophthalmology.

3. Teaching the next generation (two of four required):

- a. Surgeons and anesthesiologists participating in the surgical care of children at the center must show participation as a visiting professor or invited lecturer at five relevant national, regional, or local conferences over the past three years.
- b. The children's surgical center must show support of resident/fellow participation in institution-focused scholarly activity, including laboratory experiences, clinical trials, or resident paper competitions at the state, regional, or national level (for example, the committee on trauma resident paper competition).
- c. The children's surgical center must show 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.

- d. The children's surgical center demonstrates involvement in furthering the training of residents, fellows, medical students, and/or Advanced Practice Providers either from their own or other institutions, in the inpatient or outpatient surgical care of surgical patients.

Documentation

Leader of a System (all four required):

- Upload an example of a current symposium offered to regional practitioners that promote optimal surgical care of children.
- Upload an example of a current outreach program for the non-medical public.
- Provide on-site examples of current transfer agreements to local and regional hospitals.
- Provide examples of relevant children's surgical education to nurses and other allied health professionals who are part of the care of children's surgical problems at local and regional hospitals.

Creation dissemination, and/or implementation of new medical and surgical knowledge (two of four required):

- Provide a list of surgeons and anesthesiologists who are members on committees of any of the regional and national organizations that are related to children's surgical care or demonstrable similar work.
- Provide demonstrated evidence of funding of the center from a recognized government, intramural, or extramural private agency or organization.
- Provide an example from three of the five outlined categories over the past three years.
- Upload the research and publication table.

Teaching the next generation (two of four required)

- Upload the Visiting Professor Conference table illustrating at least five lectures presented by a member of the children's surgery team.
- Provide evidence of resident participation in institution-focused scholarly activity, including laboratory experiences, clinical trials, or resident paper competitions at the state, regional, or national level.
- Upload the ACGME table demonstrating development of a children's surgical fellowship program or give examples of matriculation of graduating residents into surgical fellowship programs.
- Upload the ACGME table.

8.2 Children's Surgery Education for Nurses and Other Allied Health Professionals

Rationale

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 provide financial resources to facilitate intramural and extramural educational programs.

Definition and Requirements

Nurses and other allied health professionals who are involved in the children's surgical care program must have their educational needs identified and served.

All Levels

- Children's surgical center 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 (for example, Pediatric Learning Solutions, PEARS).

Documentation

- Provide examples of relevant children's surgical education to nurses and other allied health professionals who are part of the children's surgical team.



AMERICAN COLLEGE OF SURGEONS
CHILDREN'S SURGERY VERIFICATION QUALITY IMPROVEMENT PROGRAM

9 Research

*Fulfilled by 8.1 Children's Surgery Education, Outreach,
and Scholarly Activities*

Appendix I Children’s Surgery Safety Report Reference Guide

- Please refer to 6.2 Children’s Surgery Safety Report for more details
- Major Safety Events (MSE): 100% capture of events
- Monitor Events (ME): Capture 100% of events
- Anesthesia Events (AE): Captured by Anesthesia and 100% capture of events
- A surgical procedure is defined as a case requiring general anesthesia

Category	Event	Timeframe*	Definition
MSE	Medication error: Wrong medication or dosing	Intraoperative events or those occurring within 48 hours of operation	Wrong drug, wrong patient, infusion error, or administration of drug that patient is known to be allergic to, resulting in need for ongoing care, not a result of underlying disease
MSE	Operation on incorrect patient	Intraoperative events	Start of surgery or induction of anesthesia on the wrong patient
MSE	Operation on incorrect side/site	Intraoperative events	Start of surgery or anesthesia on the wrong body part or wrong side of patient
MSE	Wrong operation performed	Intraoperative events	The wrong operation was performed on the patient, including using an incorrect or expired device
MSE	Surgical fires and/or patient burns	Intraoperative events	Spark or flame in the OR resulting in patient injury or damage to surgical supplies or equipment including surgical drapes
MSE	Transfusion reaction within 48 hours	Intraoperative events or the immediate postoperative period (PACU/ICU)	Patient had a transfusion reaction after receiving a blood product initiated during the index procedure
MSE	Unintentional retained foreign body	Intraoperative events	Surgical items or foreign objects retained after skin closure following an invasive procedure that resulted in a return to the operating room or an additional intervention
MSE	Loss or mishandling of an irreplaceable biological specimen	Intraoperative events	The loss or mishandling of a biological specimen that results in an additional intervention or an inability to diagnose
MSE	Death within 30 days	Intraoperative events and events occurring within 30 days postoperative period and within the hospital stay	
ME	Unanticipated ICU admission within 48 hours	Intraoperative events or those occurring within 48 hours of operation	Any occurrence in which a patient was admitted to a non-ICU bed after a surgical procedure and within 48 hours was transferred to any ICU bed

ME	Unanticipated transfer to another institution for higher level of patient care within 30 days	Events occurring within 30 days of the postoperative period	This includes patients transferred to the main hospital from satellite locations
ME	Any neurologic deficit following surgery or regional anesthesia: Residual sensory, motor, or autonomic block	Intraoperative events or the immediate postoperative period (PACU/ICU)	New residual sensory and/or motor and/or autonomic deficit that persists 72 hours after the operation or the last local anesthetic injection
ME	CPR during operation	Intraoperative events	Utilize ACS NSQIP Pediatric definition
ME	Unplanned extubation	Intraoperative events	Utilize ACS NSQIP Pediatric definition
ME	Cerebral vascular accident/stroke or intracranial hemorrhage	Events occurring within 30 days of the postoperative period	Utilize ACS NSQIP Pediatric definition
AE	Major systemic local anesthetic toxicity	Intraoperative events	Following the injection of local anesthetic, new onset of: Seizure, somnolence, loss of consciousness, respiratory depression/apnea, bradycardia/asystole, or ventricular tachycardia/fibrillation thought to be related to the injection
AE	Infection following epidural or spinal anesthesia, or peripheral nerve block: Abscess, meningitis, or sepsis	Events occurring within 30 days of the postoperative period	Superficial (swelling, local erythema, and tenderness) or deep (abscess) with any of the following: Fever > 38 degrees Celsius, drainage, positive culture, leukocytosis, neurologic deficit, localized back pain, or neck pain
AE	Postdural puncture headache	Intraoperative events or those occurring within 48 hours of operation	Headache after intended or unintended dural puncture that requires either prolonged bedrest or an epidural blood patch
AE	Intraoperative awareness: Explicit awareness during anesthesia	Intraoperative events	Patient memory of events in the OR that occurred while the patient was under general anesthesia
AE	Visual loss: Permanent impairment or total loss of sight	Intraoperative events	Any permanent impairment or total loss of sight
AE	Malignant hyperthermia: Definite, suspected, or use of dantrolene (during or after exposure to anesthetic gases or succinylcholine)	Intraoperative events	Signs include increasing end-tidal CO ₂ , trunk or total body rigidity, masseter spasm or trismus, tachycardia, tachypnea, mixed respiratory and metabolic acidosis, increased temperature, and myoglobinuria

* Timeframe denotes when the event occurred, not when it was detected. For example, a patient received the wrong medication during the procedure. This was detected the following day. This event occurred during the intraoperative timeframe but was detected during the postoperative timeframe.

Level III centers that do not participate in ACS NSQIP Pediatric **should** include the following monitoring events to review:

- Coma > 24 hours
- Seizure
- Cardiac arrest requiring CPR
- Venous thrombosis requiring therapy
- Unplanned intubation
- Blood transfusion
- Unplanned readmission

Appendix II Alternative Pathway

Rationale

The Children's Surgery Verification Program endorses the principle that pediatric surgical patients are taken care of by appropriately trained pediatric providers. The alternative pathway enables anesthesiologists, radiologists, and emergency medicine providers to demonstrate equivalent pediatric training and experience by completing requirements outlined below.

Definition and Requirements

Providers must meet all eight requirements within their respective specialty. Criteria seven and eight are reviewed by the on-site reviewers during the on-site review.

Please upload alternative pathway requirements **one through six** in the respective sections of the PRQ and provide hard copies of all requirements onsite for each provider. **The percent pediatric practice of the providers will be required when completing the specific PRQ tables.**

- Requirements seven and eight are reviewed onsite and do not have to be submitted beforehand.
- Please utilize the alternative pathway cover sheets embedded within the Pre-Review Questionnaire (PRQ) to collect each provider's information.

Pediatric Anesthesiology	Pediatric Emergency Medicine	Pediatric Radiology
All criteria must be fulfilled for the anesthesiologist to be approved by the alternate pathway.	All criteria must be fulfilled for an emergency medicine provider to be approved by the alternate pathway.	All criteria must be fulfilled for a radiologist to be approved by the alternate pathway.
1. A current CV must be submitted for review at the time of application.	1. A current CV must be submitted for review at the time of application.	1. A current CV must be submitted for review at the time of application.
2. Evidence that the anesthesiologist successfully completed a residency training program in anesthesiology with the time period consistent with the years of training in the U.S. This completion must be certified by one of the following: <ul style="list-style-type: none"> • A signed letter from the residency program director or pediatric fellowship program director that details the pediatric component of the individual's training. • A signed letter from the provider attesting to his/her own pediatric educational training. • If applicable, a copy of a fellowship certificate from an ACGME accredited pediatric fellowship program. 	2. Evidence that the emergency medicine provider successfully completed a residency training program in emergency medicine or pediatrics with the time period consistent with the years of training in the U.S. This completion must be certified by one of the following: <ul style="list-style-type: none"> • A signed letter from the residency program director or pediatric fellowship program director that details the pediatric component of the individual's training. • A signed letter from the provider attesting to his/her own pediatric educational training. • If applicable, a copy of a fellowship certificate from an ACGME accredited pediatric fellowship program. 	2. Evidence that the radiologist successfully completed a residency training program in radiology with the time period consistent with the years of training in the U.S. This completion must be certified by one of the following: <ul style="list-style-type: none"> • A signed letter from the residency program director or pediatric fellowship program director that details the pediatric component of the individual's training. • A signed letter from the provider attesting to his/her own pediatric educational training. • If applicable, a copy of a fellowship certificate from an ACGME accredited pediatric fellowship program.
3. Documentation of current status as a provider or instructor in the Pediatric Advanced Life Support (PALS) program.	3. N/A	3. Documentation of current status as a provider or instructor in the Pediatric Advanced Life Support (PALS) program.

<p>4. A list of the 36 hours of children's anesthesia-related continuing medical education (CME) during the past three years. Evidence that such hours are pediatric-specific must be readily available at the site visit.</p>	<p>4. A list of the 36 hours of children's emergency medicine-related continuing medical education (CME) during the past three years. Evidence that such hours are pediatric-specific must be readily available at the site visit.</p>	<p>4. A list of the 36 hours of children's radiology-related continuing medical education (CME) during the past three years. Evidence that such hours are pediatric-specific must be readily available at the site visit.</p>
<p>5. Documentation of membership or attendance at local, regional, or national anesthesia meetings during the past three years.</p>	<p>5. Documentation of membership or attendance at local, regional, or national emergency medicine meetings during the past three years.</p>	<p>5. Documentation of membership or attendance at local, regional, or national radiology meetings during the past three years.</p>
<p>6. A license to practice medicine and documentation of full and unrestricted anesthesia privileges to care for children younger than two years by the hospital's credentialing committee.</p>	<p>6. A license to practice medicine and documentation of full and unrestricted emergency medicine privileges to care for children younger than five years by the hospital's credentialing committee.</p>	<p>6. A license to practice medicine and documentation of full and unrestricted radiology privileges to care for children younger than five years by the hospital's credentialing committee.</p>
<p>7. The physician's clinical practice must have been devoted primarily to pediatric anesthesiology for the last two years, or at least 30 percent of the clinical practice averaged over the last five years must have been devoted to pediatric anesthesiology. The physician's practice must include children two years or younger and procedures considered high risk. A list of patients younger than two years and their diagnoses treated during the reporting year must be provided.</p> <p>If the anesthesiologist on the alternative pathway does not have experience with neonates, the institution must demonstrate that coverage for neonates is provided 24/7 by a pediatric anesthesiologist with ongoing neonatal experience. A back-up call schedule for the last three months must be provided to ensure children of all ages, including neonates are cared for by an appropriately trained provider.</p> <p>*Percent clinical practice can be calculated by the number of pediatric patients seen divided by the total patient volume or the number of pediatric shifts practiced divided by the total number of shifts. In either calculation, percent clinical practice must be clearly demonstrated.</p>	<p>7. The physician's clinical practice must have been devoted primarily to pediatric emergency medicine for the last two years, or at least 30 percent of the clinical practice averaged over the last five years must have been devoted to pediatric emergency medicine. The physician's practice must include neonates and children five years or younger. A list of patients five years or younger and their diagnoses treated during the reporting year must be provided.</p> <p>*Percent clinical practice can be calculated by the number of pediatric patients seen divided by the total patient volume or the number of pediatric shifts practiced divided by the total number of shifts. In either calculation, percent clinical practice must be clearly demonstrated.</p>	<p>7. The physician's clinical practice must have been devoted primarily to pediatric radiology for the last two years, or at least 30 percent of the clinical practice averaged over the last five years must have been devoted to pediatric radiology. The physician's practice must include neonates and children five years or younger. A list of patients five years or younger and their diagnoses 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> <p>*Percent clinical practice can be calculated by the number of pediatric patients seen divided by the total patient volume or the number of pediatric shifts practiced divided by the total number of shifts. In either calculation, percent clinical practice must be clearly demonstrated.</p>
<p>8. 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.</p> <p>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 must be available for on-site review.</p>	<p>8. 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.</p> <p>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.</p>	<p>8. The volume and quality of pediatric radiology care that is provided by the non-board-certified emergency medicine provider must be determined to be adequate during the site review process.</p> <p>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.</p>

Appendix III Surgeon Equivalency

Surgeon Equivalency

In circumstances where an applicant organization credentials an individual provider based on “equivalent” training to that certified by an ABMS Board, the ACS review team will review the experience and training of this individual. If there is ambiguity or concern on the part of the ACS site visit team regarding equivalency, the appropriate ABMS Board or specialty society will be asked to review the provider’s experience and training relative to actual credentials. In the case of neurosurgery, this will be the American Board of Pediatric Neurosurgery. This external review will be the basis for ACS-CSV decision regarding verification status.

Appendix IV Pediatric Neurosurgery Call Coverage

Pediatric Neurosurgery Call Coverage to Supplement Standards 4.1 and 4.12

In Level I and II CSV centers the need for specialized pediatric neurosurgeon coverage has been addressed jointly by the American Board of Neurological Surgery (ABNS) and the American Board of Pediatric Neurosurgery (ABPNS) with the leadership of the ACS CVS program. The subspecialty pediatric training and skills defined by ABPNS are recognized, however there is consensus that emergent neurosurgical conditions in children are unique in that all may be appropriately managed initially by a non-pediatric specialist neurosurgeon. Therefore, pediatric neurosurgeon coverage gaps up to 72 hours are permitted in CSV centers without pediatric back up call coverage. Appropriate credentialing of involved neurosurgeons by the individual center is required.

Appendix V Stakeholders Meeting

September 23, 2020

Sameera Ali, MPH, American College of Surgeons
Jill M. Baren, MD, MBE, American Board of Emergency Medicine
Douglas Barnhart, MD, MSPH, FACS, CSV Verification Committee Co-Chair
Gail Besner, MD, American Academy of Pediatrics Section on Surgery
Patrick Cartwright, MD, CSV Verification Committee
Randall Clark, MD, FASA, American Society of Anesthesiologists
Robert Connors, MD, Helen DeVos Children's Hospital
Andrew Davidoff, MD, St. Jude Children's Research Hospital
Mark Del Monte, JD, American Academy of Pediatrics
Craig Derkay, MD, FACS, CSV Verification Committee
Jayant Deshpande, MD, CSV Verification Committee
Jennifer Dietrich, MD, MSc, FACOG, FAAP, AAP Section Chair, Pediatric and Adolescent Gynecology
Shelby Eagle, MPH, American College of Surgeons
Anne Edwards, MD, FAAP, American Academy of Pediatrics
Joyce Enochs, BSN, RN, CNOR, Texas Children's Hospital
Mary Fallat, MD, FACS, CSV Verification Committee Co-Chair
Nicole Faster, MSN, RNC-NIC, American Academy of Pediatrics NICU Verification Program
Barrett Fromme, MD, MHPE, AAP Section on Hospital Medicine
Marianne Gausche-Hill, MD, FACEP, FAAP, FAEMS, American Board of Emergency Medicine
Keith Georgeson, MD, FACS, CSV Verification Committee
Javier Gonzalez del Rey, MD, Med, American Academy of Pediatrics Section on Pediatric Emergency Medicine
Kenneth Gow, MD, FACS, FAAP, Seattle Children's Hospital
Catherine Grant, BSN, RN, American College of Surgeons
Philip Guzzetta, MD, Children's National Medical Center
Lynn Haas, RN, MSN, CSV Verification Committee
Ronald Hirschl, MD, FACS, CSV Verification Committee
Constance Houck, MD, CSV Verification Committee
David Hoyt, MD, FACS, American College of Surgeons
Charles Hughes, MD, Providence Children's Health
Chip Iwinski, MD, Shriners Hospitals for Children
Emily Jones, American College of Surgeons
Bruce Kaufman, MD, American Board of Pediatric Neurosurgery and American Board of Neurological Surgery
Brian Kenney, MD, MPH, CSV Data Committee
Clifford Y. Ko, MD, MSHS, FACS, American College of Surgeons
Erica McNamara, American College of Surgeons
Laura Monson, MD, American Society of Craniofacial Surgery
David Mooney, MD, FACS, CSV Verification Committee
Joshua Nagler, MD, MHPEd, PEM Program Director
Jill Dykstra-Nykanen, RN, MSN, CPHQ, Arnold Palmer Children's Hospital
Keith Oldham, MD, FACS, CSV Verification Committee Chair
Richard Paula, MD, Shriners Hospitals for Children
Karen Pollitt, American College of Surgeons
Shawn Rangel, MD, MSCE, CSV Data Committee
David Rappaport, MD, FAAP, FHM, AAP Section on Hospital Medicine
Jackie Saito, MD, MSCI, CSV Data Committee
Mike Sarap, MD, FACS, Southeastern Ohio Physicians, Inc.
Robert Sawin, MD, FACS, CSV Verification Committee
David Schmeling, MD, Children's Hospitals and Clinics of Minnesota
Vani Sistla, MPH, Duke Children's Hospital
Ann Stark, MD, FAAP, AAP Section on Neonatal-Perinatal Medicine
Joe Szokol, MD, American Society of Anesthesiologists
David Tuggle, MD, FACS, CSV Verification Committee
Michael G. Vitale, MD, Pediatric Orthopedic Society of North America
John Waldhausen, MD, American Pediatric Surgical Association

Appendix VI Related Standards

Category	Standards
NICU	3.1: Neonatal Intensive Care Unit (NICU)
	4.5: NICU Personnel
PICU	3.2: Pediatric Intensive Care Unit (PICU)
	4.6: PICU Personnel
ED	3.3: Emergency Department Facilities
	4.9: Emergency Department Personnel
PREOP	3.4: Preoperative Facilities
	4.15: Preoperative Personnel
OR	3.5: Operating Room Facilities
	4.16: Operating Room Personnel
	5.1: Operating Room Protocols
PACU	3.6: Pediatric Post-Anesthesia Care Unit (PACU)
	4.17: Post-Anesthesia Care Unit (PACU) Services
Blood/Lab	3.8: Blood Bank and Laboratory Services
	4.24: Laboratory Services
	5.3: Massive Transfusion Protocol (MTP)
Imaging	3.7: Imaging Facilities
	4.7: Imaging Services - Diagnostic Imaging
	4.8: Imaging Services - Interventional Radiology
	5.2: Radiology Protocols
ACS NSQIP	2.12: ACS NSQIP Pediatric Surgeon Champion (SC)
	2.13: ACS NSQIP Pediatric Surgical Clinical Reviewer (SCR) and Other Data Collection Personnel
	6.1: ACS NSQIP Pediatric
	7.3: PIPS Committee Responsibility
	7.5: PIPS and Data Review
Transfers	2.5: Ambulatory Surgery Patients and Ambulatory Surgical Center
	2.7: Referrals within Region
	2.8: Transfer Agreements and Protocols/Guidelines
	4.26: Transport Services
	7.7: Transport and Transfer Review
Ambulatory	2.4: Operating Room (OR) Committee
	2.5: Ambulatory Surgery Patients and Ambulatory Surgical Center
	2.8: Transfer Agreements and Protocols/Guidelines
	2.10: Medical Director of Children's Anesthesiology (MDCA)
	3.4: Preoperative Facilities
	3.5: Operating Room Facilities
	3.6: Pediatric Post-Anesthesia Care Unit (PACU)
5.7: Perioperative Anesthesia Risk Assessment Program	

Appendix VII Criteria Quick Reference Guide

2021 Standards	Level I	Level I Specialty Musculoskeletal	Level I Specialty Oncology	Level II	Level III	Different Requirements by Level	V1 Standards
1 INSTITUTIONAL ADMINISTRATIVE COMMITMENT							
1.1 Institutional Commitment	x	x	x	x	x		2.1, 4.1, 4.2, 8.2
1.2 Administrative Structure	x	x	x	x	x		2.3, 4.3
2 PROGRAM SCOPE AND GOVERNANCE							
2.1 Hospital Governance	x	x	x	x	x		5.1
2.2 Surgical Volume Requirement	x	x	x	x		x	2.8
2.3 Surgical Infrastructure	x	x	x	x	x		4.14, 4.15
2.4 Operating Room (OR) Committee	x	x	x	x	x	x	4.16, 4.17, 4.18
2.5 Ambulatory Surgery Patients and Ambulatory Surgical Center	x	if applicable	if applicable	x	x		2.66, 2.67, 2.68, 2.69, 2.70, 2.71, 2.72, 2.73, 2.74
2.6 State and/or Regional System Planning	x	x	x	x	x		1.1
2.7 Referrals within Region	x	x	x	x	x		2.2
2.8 Transfer Agreements and Protocols/Guidelines	x	x	x	x	x	x	2.37, 2.54, 2.64, 2.74
2.9 Medical Director of Children's Surgery (MDCS) or Program Director (PD)	x	x	x	x	x	x	2.30, 2.32, 2.59, 4.4, 4.5, 4.6 (deleted), 4.7, 4.8, 7.9, 8.8
2.10 Medical Director of Children's Anesthesiology (MDCA)	x	x	x	x	x	x	4.9, 4.10, 4.11 (deleted), 4.12, 4.13, 6.1, 6.8
2.11 Children's Surgery Program Manager (CSPM)	x	x	x	x	x		4.19, 4.20, 7.8, 7.9
2.12 ACS NSQIP Pediatric Surgeon Champion (SC)	x	x	if applicable	x			7.9, new standard
2.13 ACS NSQIP Pediatric Surgical Clinical Reviewer (SCR) and Other Data Collection	x	x	if applicable	x			7.8, 7.9, 7.10, new standard
3 FACILITIES AND EQUIPMENT RESOURCES							
3.1 Neonatal Intensive Care Unit (NICU)	x			x		x	2.17, 2.41
3.2 Pediatric Intensive Care Unit (PICU)	x	x	x	x	x	x	2.19
3.3 Emergency Department Facilities	x	x	x	x	x	x	2.27, 2.47, 2.48, 6.27
3.4 Preoperative Facilities	x	x	x	x	x		2.70, 6.16
3.5 Operating Room Facilities	x	x	x	x	x	x	2.72, 6.9, 6.13
3.6 Pediatric Post-Anesthesia Care Unit (PACU)	x	x	x	x	x		2.70, 6.14, 6.15
3.7 Imaging Facilities	x	x	x	x	x	x	6.22, 6.23
3.8 Blood Bank and Laboratory Services	x	x	x	x	x		6.38
3.9 Extracorporeal Membrane Oxygenation (ECMO)	x						New
3.10 Telemedicine and Teleconferencing	x	x	x	x	x		New
4 PERSONNEL AND SERVICES RESOURCES							
4.1 Surgeons	x	x	x	x	x	x	2.4, 2.5, 2.9, 2.14, 2.15, 2.33, 2.38, 2.49, 2.50, 2.51, 2.55, 2.56, 5.3, 6.26, 6.28, 10.4 (deleted)
4.2 Anesthesia Services	x	x	x	x	x	x	2.5, 2.10, 2.11, 2.39, 2.40, 2.55, 2.57, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7
4.3 Medical Specialistst	x	x	x	x	x	x	2.4, 2.33, 2.42, 2.49, 6.29, 6.30, 10.4 (deleted)

2021 Standards	Level I	Level I Specialty Musculoskeletal	Level I Specialty Oncology	Level II	Level III	Different Requirements by Level	V1 Standards
4.4 General Pediatricians and Hospitalists	x	x	x	x	x		6.31
4.5 NICU Personnel	x			x	x	x	2.13, 2.18, 6.25
4.6 PICU Personnel	x	x	x	x	x	x	2.13, 2.20, 2.43, 2.44, 6.24, 6.25
4.7 Imaging Services—Diagnostic Imaging	x	x	x	x	x	x	2.23, 2.24, 2.45, 2.46, 2.62, 2.63, 6.23
4.8 Imaging Services—Interventional Radiology	x	x	x	x			2.25, 6.23
4.9 Emergency Department Personnel	x	x	x	x	x	x	2.26, 2.29, 2.48, 2.61
4.10 Pediatric Advanced Practice Providers	x	x	x	x	x		New
4.11 Credentialing	x	x	x	x	x		2.12, 2.30, 2.34, 5.2
4.12 Call Coverage	x	x	x	x	x	x	2.6, 2.31, 5.4
4.13 Continuing Medical Education	x	x	x	x	x		2-56, 10-5
4.14 Rapid Response Teams	x	x	x	x	x	x	2-35, 2-36, 2-52, 2-53, 2-60
4.15 Preoperative Personnel	x	x	x	x	x	x	6.16
4.16 Operating Room Personnel	x	x	x	x	x		6.9, 6.10, 6.13
4.17 Post-Anesthesia Care Unit (PACU) Services	x	x	x	x	x		6.14
4.18 Pediatric Nursing	x	x	x	x	x		2.21, 2.29, 2.67, 6.10, 6.14, 6.16
4.19 Nutrition Services	x	x	x	x	x	x	6.33
4.20 Pharmacy Services	x	x	x	x			2.21
4.21 Respiratory Therapy Services	x	x	x	x	x		2.21
4.22 Child Life Services	x	x	x	x			6.34
4.23 Child Maltreatment Services	x	x	x	x	x	x	6.35, 6.36
4.24 Laboratory Services	x	x	x	x	x	x	6.37, 6.38
4.25 Renal Replacement Services	x	x	x	x	x	x	6.32
4.26 Transport Services	x	x	x	x	x	x	2.65, 3.1, 3.3, 3.5, 3.6, 6.24, 6.40
5 PATIENT CARE: EXPECTATIONS AND PROTOCOLS							
5.1 Operating Room Protocols	x	x	x	x	x		6.11, 6.12
5.2 Radiology Protocols	x	x	x	x	x		6.17, 6.18, 6.19, 6.20, 6.21
5.3 Massive Transfusion Protocol (MTP)	x	x	x				6.39
5.4 Opioid Stewardship	x	x	x	x	x	x	New
5.5 Perioperative Antibiotic Stewardship	x	x	x	x	x	x	New
5.6 Tumor Board	x	x	x	x	x		New
5.7 Perioperative Anesthesia Risk Assessment Program	x	x	x	x	x	x	New
5.8 Acute Pain Management	x	x	x	x		x	*Level I Centers must utilize at least 3 of the 6 approaches delineated in standards 5.8 through 5.13. Level II Centers must utilize at least 2 of the 6 approaches delineated in standards 5.8 through 5.13.

2021 Standards	Level I	Level I Specialty Musculoskeletal	Level I Specialty Oncology	Level II	Level III	Different Requirements by Level	V1 Standards
5.9 Clinical Protocols and Practice Guidelines	x	x	x	x			New
5.10 Outpatient Coordination of Complex Care	x	x	x	x			New
5.11 Specialized Nursing Protocols	x	x	x	x			New
5.12 Palliative Care	x	x	x	x			New
5.13 Enhanced Recovery After Surgery (ERAS) Protocols	x	x	x	x			New
6 DATA SURVEILLANCE AND SYSTEMS							
6.1 ACS NSQIP Pediatric	x	x	if applicable	x			7.1, 7.3, 7.4, 7.7
6.2 Children's Surgery Safety Report (Appendix I)	x	x	x	x	x	x	7.2, 7.8
6.3 Data Management and Electronic Resources	x	x	x	x	x		7.6
7 QUALITY IMPROVEMENT							
7.1 Hospital Integration	x	x	x	x	x		8.1, 8.9
7.2 Surgery PIPS Committee Structure	x	x	x	x	x	x	2.58, 8.5, 8.6, 8.10, 8.11
7.3 PIPS Committee Responsibility	x	x	x	x	x	x	2.7, 8.3, 8.13
7.4 Mortality and Serious Safety Event Review	x	x	x	x	x		8.7, 8.12
7.5 PIPS and Data Review	x	x	x	x	x		2.46, 8.4, 8.15
7.6 Quality Improvement Projects	x	x	x	x	x		7.5
7.7 Transport and Transfer Review	x	x	x	x	x		3.2, 3.4, 8.14
8 EDUCATION: PROFESSIONAL AND COMMUNITY OUTREACH							
8.1 Children's Surgery Education, Outreach, and Scholarly Activities	x	x	x				2.16, 9.1, 9.2, 9.3, 9.4, 9.5, 9.6, 10.1, 10.2
8.2 Children's Surgery Education for Nurses and Other Allied Health Professionals	x	x	x	x	x		10.3
9 RESEARCH							
Fulfilled by 8.1	x	x	x				2.16, 9.1, 9.2, 9.3, 9.4, 9.5, 9.6, 10.1, 10.2



AMERICAN COLLEGE OF SURGEONS

Inspiring Quality:

Highest Standards, Better Outcomes

100+years

American College of Surgeons

633 N. Saint Clair St.
Chicago, IL 60611-3295

facs.org

