

# Current State of Institutional Privileging Profiles for Pediatric Procedural Sedation Providers

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## ABSTRACT

**BACKGROUND AND OBJECTIVE:** Providers from a variety of training backgrounds and specialties provide procedural sedation at institutions in the United States. We sought to better understand the privileging patterns and practices for sedation providers.

**METHODS:** Surveys were sent to 56 program directors belonging to the Society for Pediatric Sedation using Research Electronic Data Capture to 56 pediatric sedation programs. The survey was designed to gather information regarding characteristics of their sedation service and the privileging of their sedation providers.

**RESULTS:** The overall response rate was 41 (73%) of 56. Most programs surveyed (81%) said their physicians provided sedation as a part of their primary subspecialty job description, and 17% had physicians whose sole practice was pediatric sedation and no longer practiced in their primary subspecialty. Fifty-one percent of surveyed sedation programs were within freestanding children's hospitals and 61% receive oversight by the anesthesiology department at their institution. Eighty-one percent of the sedation programs require physicians to undergo special credentialing to provide sedation. Of these, 79% grant privileging through their primary specialty, whereas 39% require separate credentialing through sedation as a stand-alone section. For initial credentialing, requirements included completion of a pediatric sedation orientation and training packet (51% of programs), sedation training during fellowship (59%), and documentation of a specific number of pediatric procedural sedation cases (49%).

**CONCLUSIONS:** In this survey of pediatric sedation programs belonging to the Society for Pediatric Sedation, the process for privileging providers in procedural sedation varies significantly from institution to institution. An opportunity exists to propose privileging standards for providers of pediatric procedural sedation.



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Demand is increasing for pediatric procedural sedation (PPS) outside the operating room by the pediatric sedation provider.<sup>1,2</sup> PPS is now provided by pediatric subspecialists, such as pediatric critical care medicine (PCCM) physicians, pediatric emergency medicine (PEM) physicians, pediatric hospitalists, and general pediatricians with varying levels of training and experience.<sup>3-5</sup> The provision of PPS by the pediatric sedation provider allows for conservation of limited resources, such as operating rooms and anesthesiologists.<sup>6</sup> The use of propofol, a general anesthetic that can induce levels of sedation ranging from deep to general anesthesia, is also on the rise for PPS.<sup>5</sup> Recent studies show that propofol can be safely and effectively used for PPS outside the operating room by the pediatric sedation provider.<sup>5,7,8</sup>

The guidelines established by the American Society of Anesthesiology (ASA),<sup>9</sup> the American College of Emergency Physicians,<sup>10,11</sup> and the American Academy of Pediatrics<sup>12,13</sup> are intended to systematize procedural sedation practice and seek to define sedation provider skills and competencies. Despite these recommendations, the process used by hospitals for credentialing and privileging the pediatric sedation provider providing PPS may vary significantly between institutions and has not been previously investigated. To characterize the current state of practice of PPS in the United States, we conducted a detailed survey to describe the credentialing/privileging process, team composition, and quality improvement expectations for the pediatric nonanesthesiology sedation provider. Surveys were sent to 56 program directors belonging to the Society for Pediatric Sedation (SPS). The SPS includes the Pediatric Sedation Research Consortium (PSRC), a collaborative group of 42 institutions that share information on sedation practice.<sup>4,5</sup> We hypothesized that significant institutional variability exists between credentialing/privileging practices of pediatric procedural sedation providers.

## METHODS

### Study Design

This study is a descriptive analysis of survey responses. The survey was created and

managed by using Research Electronic Data Capture, a tool hosted by Children's Healthcare of Atlanta.<sup>14</sup> Research Electronic Data Capture is a secure, Web-based application designed to support data capture for research studies by providing (1) an intuitive interface for validated data entry, (2) audit trails for tracking data manipulation and export procedures, (3) automated export procedures for seamless data downloads to common statistical packages, and (4) procedures for importing data from external sources. Only the study statistician had access to the database and survey responses were confidential. The study met the criteria for exemption from review by the institutional review board at Children's Healthcare of Atlanta.

The survey consisted of 20 main questions broken down into 3 primary sections: (1) credentialing of the sedation physician (7 questions), (2) description of the sedation team (4 questions), and (3) description of the sedation service and quality metrics (9 questions). All survey questions were in the form of close-ended, multiple-choice questions or questions that allowed users to select multiple responses. For survey responses designated as "other," a free textbox was included to allow respondents to provide additional information. Some questions had branching logic, so it was possible for respondents to answer more than 20 questions. For example, if a respondent noted that his or her institution used physician extenders, subsequent questions were asked regarding the type of physician extenders used. Survey questions are provided in the Supplemental Information.

### Participants

Surveys were sent to 56 program directors belonging to the SPS. Four weeks after the initial survey was e-mailed, a follow-up reminder was sent to those directors who had not yet replied. The survey was closed to responses in June 2014.

### Data Analysis

Analysis was carried out by using survey responses achieving a completion rate of  $\geq 80\%$  of the survey questions. Results of the survey were analyzed by using descriptive statistics. Numerical counts and

percentages were tabulated for each question. For some questions, survey respondents could make multiple selections. As a result, some percentages add to more than 100%. SAS version 9.3 (SAS Institute, Inc, Cary, NC) was used to analyze the data.

## RESULTS

### Demographics and Sedation Practice Characteristics

Fifty-six medical directors were surveyed. Eleven (20%) did not respond. Among the 45 respondents, 4 (9%) were only partially completed and were not used. As a result, 41 complete responses were received, for an overall response rate of 73%. Demographics of sedation programs are provided in Table 1. Twenty-one (51%) programs surveyed were freestanding children's hospitals or medical centers, 18 (44%) were children's hospitals within a larger medical center, and 4 (10%) were community hospitals with adult and pediatric patients. Fifty-one percent of sedation programs sedated at least 2000 patients per year. Most programs (95%) sedated for radiologic procedures. Other common sedated procedures were hematology/oncology (88%), surgical (95%), and neurologic (90%). All programs surveyed sedated for ASA classes I and II, and 76% sedated for ASA class III. Propofol was the most common sedative used (32/41; 78%) for radiologic procedures. Thirty-six (88%) routinely bill with anesthesia codes denoting provision of deep sedation. For some questions, survey respondents could make multiple selections. As a result, some percentages add to  $>100\%$ .

### Structure and Sedation Teams

Sedation team structure results are provided in Table 2 and Fig 1. Sedation teams were most commonly staffed by fewer than 5 physicians (39%), followed by 5 to 10 physicians (32%). Twelve (29%) programs used an advanced practice nurse (APN) or physician assistant (PA) as a sedation provider, of which 11 (92%) of 12 of these programs used an APN and 3 (25%) used a PA. Only 1 program used a nurse anesthetist. Most programs (78%) were staffed by PCCM physicians, whereas 23% used PEM physicians and 27% used

**TABLE 1** Summary of Sedation Practice

Question	<i>n</i> Responded/Applicable	Level/Choice	<i>n</i> (%)
Our sedation team provides sedation at: (Multiple choices may apply)	41	A freestanding children's hospital/medical center	21 (51.2)
		A children's hospital within a large medical center	18 (43.9)
		A community hospital with pediatric and adult patients	4 (9.8)
		A freestanding radiology or imaging center	4 (9.8)
		Other	0 (0)
Our sedation service provides sedation for approximately:	41	<1000 patients per year	10 (24.4)
		1000–2000 patients per year	10 (24.4)
		2001–5000 patients per year	18 (43.9)
		>5000 patients per year	3 (7.3)
The sedation team in your hospital sedates for: (Multiple choices may apply)	41	Radiology	39 (95.1)
		Hematology/Oncology	36 (87.8)
		Gastrointestinal endoscopies	16 (39.0)
		Surgical	39 (95.1)
		Neurologic	37 (90.2)
		Other	19 (46.3)
The sedation service at your institution typically provides sedation for patients with the following ASA categories: (Multiple choices may apply)	41	I	41 (100)
		II	41 (100)
		III	31 (75.6)
		IV	5 (12.2)
		Other	0 (0)
Our primary sedation medication for radiologic procedures is:	41	Propofol	32 (78.1)
		Brevital	0 (0)
		Ketamine	0 (0)
		Narcotic and benzodiazepine	1 (2.4)
		Other	8 (19.5)

pediatric anesthesiologists. Pediatric hospitalists staffed 19.5% of the sedation programs. Most programs (81%) had pediatric subspecialty physicians sedate as a part of their primary job description. Some programs (17%) programs were staffed by pro re nata (PRN) physicians who practiced in a pediatric subspecialty, whereas only 4 (10%) programs used a hybrid of pediatric subspecialty and PRN physicians.

### Credentialing and Recredentialing

The type of training required by a sedation provider as a requirement of credentialing is provided in Table 3. Thirty-six (88%) of the 41 programs surveyed provided sedation training to the sedation providers as a component of the credentialing process. In the programs surveyed, initial credentialing required  $\geq 1$  of the following:

dedicated time in an operating room with anesthesiologist supervision (39%), training electives in sedation (58%), and completion of the SPS Sedation Provider Course (17%).<sup>15</sup> Other training included working with existing team members (proctored time with credentialed providers) ( $n = 8$ ), use of a sedation module or in-house simulation training ( $n = 6$ ), didactics ( $n = 1$ ), passing a written examination ( $n = 2$ ), a residency in anesthesia or specialty fellowship ( $n = 2$ ), or a combination of these. Most programs (81%) surveyed used special credentialing in addition to their primary service training to provide sedation services. Programs required a diversity of specific mechanisms of evidence of competency, including documentation of specific sedation training, numbers of sedation events performed, and additional training courses, such as pediatric

advanced life support (PALS) or advanced cardiovascular life support (ACLS). In the programs surveyed, initial credentialing required (1) evidence of procedural sedation/analgesia training during fellowship (24/41; 59%), (2) documentation of performance of a specified number of pediatric procedural sedations or a certain number of proctored deep sedation cases (20/41; 49%), and (3) successful completion of a procedural sedation orientation packet (21/41; 51%). Current PALS certification is required in 30 (73%) of 41 programs and ACLS certification was required in 1 (2.4%). Table 4 provides a summary of programs' sedation credentialing characteristics. For most programs, initial credentialing and recredentialing was granted through their primary specialty, 79% and 83% of the time, respectively. Credentialing was granted through sedation as a separate specialty

**TABLE 2** Sedation Team Structure

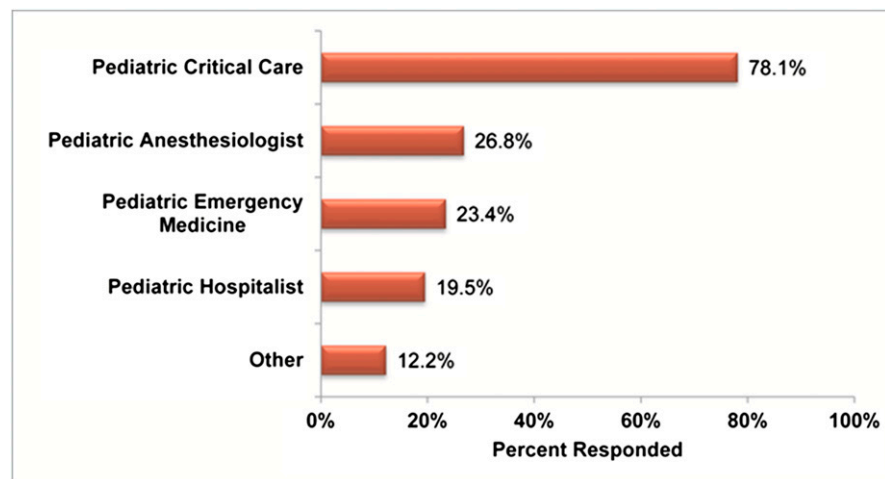
Question	N (%)
Do you use physician extenders as sedation providers? ( <i>n</i> = 41)	
No	29 (70.7)
Yes	12 (29.3)
Nurse anesthetist	1 (8.3)
Physician assistant	3 (25.0)
Nurse practitioner	11 (91.7)
The sedation team is staffed by: ( <i>n</i> = 41)	
<5 physicians	16 (39.0)
5–10 physicians	13 (31.7)
11–20 physicians	9 (22.0)
21–30 physicians	3 (7.3)
Our sedation team staffing model involves: ( <i>n</i> = 41) (Multiple choices may apply)	
Primary pediatric specialty physicians that sedate as a part of their job description	33 (80.5)
PRN physicians, who are also pediatric specialists	7 (17.1)
A hybrid of pediatric subspecialist and PRN	4 (9.8)
APN or PA supervised by the department of anesthesia	3 (7.3)
Other	
Has physicians on the team that no longer practice in their primary subspecialty ( <i>n</i> = 41)	9 (22.0)

section in 13 (39%) of 33 programs. Recredentialing was not required in 4 (10%) of 41 programs.

### Quality Improvement in Sedation

All but 1 program identified specific quality improvement processes in sedation as part of their focused professional practice

evaluation. Most, 26 (63%) of 41, tracked, as a quality metric, sedations requiring an increased level of care. Failed sedates (inability to complete a procedure due to a sedation-related cause) and major sedation-related adverse events were tracked by 25 (61%) and 31 (76%) programs, respectively. Table 5 provides



**FIGURE 1** Summary of pediatric providers that provide routine pediatric procedural sedation. Each bar represents the percentage of programs (of 41) that had this type of sedation provider as a part of their sedation team.

a summary of the quality improvement initiatives.

### DISCUSSION

The use of PPS has become the standard of care to achieve acceptable conditions during pediatric imaging and procedures.<sup>16,17</sup> Demand for PPS outside the operating room has outpaced anesthesiologist availability.<sup>18,19</sup> This shortage has been compounded by the rapid growth of diagnostic and therapeutic procedures in recent years.<sup>4</sup> Physicians from other pediatric subspecialties, such as PCCM, PEM, and pediatric hospital medicine, have been able to be trained to staff sedation services in pediatric and general hospitals. With this growth of nonanesthesia-based sedation services, questions regarding consistency of staffing, education, training, and credentialing arise. Although guidelines for administration of sedation services have been provided by the American Academy of Pediatrics,<sup>12,13</sup> American College of Emergency Physicians,<sup>10,11</sup> American Academy of Pediatric Dentistry,<sup>20</sup> and ASA,<sup>9</sup> there is limited information about the credentialing patterns and practices of the sedation providers involved with the various pediatric sedation programs in the United States. It is left up to institutions and individual departments to determine verification of competency for providers and their credentialing. The Centers for Medicaid and Medicare Services and The Joint Commission (TJC) have published statements regarding the provision of sedation, its oversight, and regulation.<sup>21,22</sup> However, specific requirements are not well defined for training, credentialing, privileging or patient selection and preparation of patients, informed consent, staff training and competency verification, and continuous quality improvement.<sup>21,22</sup>

Our survey of a group of pediatric sedation program directors affiliated with the Society for Pediatric Sedation found that PPS programs are being used in both freestanding children's hospitals and at children's facilities within adult medical centers. Most programs provided sedation for relatively large numbers of children (2000–5000 patients per year). Propofol was

**TABLE 3** Training of Sedation Team

Characteristics	<i>n</i> (%)
All sedation providers receive training in sedation ( <i>n</i> = 41)	
No	5 (12.2)
Yes	36 (87.8)
Sedation training received (multiple responses may apply) ( <i>n</i> = 36)	
Time spent in operating room with anesthesia	14 (38.9)
Elective in sedation	21 (58.3)
SPS simulation course	6 (16.7)
Other	19 (52.8)

the sedative of choice for most of the programs surveyed. This is not surprising, given the effectiveness, rapid induction, and short duration of action, and short recovery times when using propofol compared with other drugs.<sup>23,24</sup> Directors reported sedation for patients not only meeting ASA class I and II criteria, but also those meeting ASA III.

**TABLE 4** Credentialing Characteristics of Sedation Programs

Credentialing Characteristics	<i>n</i> (%)
Initial credentialing ( <i>n</i> = 41)	
Do your physicians receive special credentialing to provide sedation service?	
No	8 (19.5)
Yes	33 (80.5)
Initial credentialing is granted through ( <i>n</i> = 33) (multiple choices may be selected)	
Credentialing granted through a primary specialty	26 (78.7)
Credentialing granted through sedation as a separate specialty section	13 (39.4)
Pediatric specialties that can be credentialed: ( <i>n</i> = 33)	
PCCM	33 (100)
PEM	26 (78.8)
Pediatric anesthesia	27 (81.8)
Pediatric hospitalist	4 (12.1)
Initial credentialing requirement for sedation providers includes ( <i>n</i> = 41) (multiple choices may be selected)	
Documentation having performed a certain number of pediatric procedural sedates or documented proctoring of a certain number of deep sedation cases	20 (48.8)
Evidence of procedural sedation/analgesia training during fellowship	24 (58.5)
Successful completion of pediatric procedural sedation orientation packet	21 (51.2)
Current PALS certification	30 (73.2)
ACLS Certification	1 (2.4)
Rec credentialing ( <i>n</i> = 41)	
Rec credentialing through primary subspecialty	34 (82.9)
Rec credentialing through other mechanisms	3 (7.3)
No requirement for rec credentialing	4 (9.8)
Rec credentialing of sedation providers requires: ( <i>n</i> = 41)	
Maintenance of proficiency in safe administration of procedural sedation by performing a minimum number of sedations/y	26 (63.4)
Maintenance of airway skills in the operating room	10 (24.4)
Attendance at a pediatric sedation simulation course	1 (2.4)
Current certification in PALS	27 (65.9)
Other	6 (14.6)
None	4 (9.8)

Studies have identified ASA III as a predictor for adverse events during propofol sedation, emphasizing the importance of ensuring adequate assessment of competence for care delivery of such higher-risk patients.<sup>2,5,25</sup>

In this survey of sedation programs belonging to the SPS, most were staffed by PCCM (78%) and PEM (23%) physicians. Couloures et al<sup>4</sup> published a similar finding of a higher number of sedations being provided by PCCM and PEM physicians. They used PSRC data, in which participating sites were highly motivated to set up systems with adequately trained staff and safeguards in place. Our findings were not surprising, as selected physicians were formally fellowship trained in administration of sedatives and analgesics, resuscitation, advanced life support, and airway management.<sup>26</sup> Most of the programs surveyed had physicians who provided sedation as a part of their primary job description. The PSRC has previously shown that provision of PPS by a select group of highly trained individuals who consistently provide sedation is associated with >99% effectiveness and a low rate of serious adverse events. Such effectiveness and proficiency may not necessarily be generalizable to all sedation providers.<sup>4,27-29</sup> A small portion (22%) of the programs were staffed by physicians who practiced only in sedation and no longer practiced in their primary subspecialty. Provision by such providers could represent a trend for specialty PEM or PCCM physicians transitioning from a career with significant night or weekend coverage to work in a more elective daytime setting.<sup>30-32</sup> Such a trend underlines the need to outline more robust and better defined rec credentialing requirements to ensure that providers performing outside of their previous specialty field remain competent to manage complications of deep sedation.

Credentialing is the administrative process for validating the qualifications of licensed professionals and appraising their background for membership to medical staff.<sup>33</sup> Credentialing serves as a prerequisite for granting clinical privileges. TJC requires all institutions to

**TABLE 5** Quality Improvement In Sedation Programs

	Quality Improvement Task	n = 41
Quality improvement in sedation involves: (Multiple choices may apply)	Tracking of failed sedates	25 (61.0)
	Tracking of sedates requiring an increased level of care	26 (63.4)
	Tracking of major complications	31 (75.6)
	Tracking of charting accuracy	17 (41.5)
	Tracking of drug dosing errors	18 (43.9)
	None of the above	1 (2.4)
	All of the above	19 (46.3)
	Other	4 (9.8)

verify practitioners' licensure, drug enforcement administration number, and education and training before granting privileges to administer sedation, although individual institutions determine specifics of credentialing.<sup>21</sup> Credentialing and privileging relate to competency, and not merely to educational milestones.<sup>34</sup> In most of the sedation programs surveyed, most of the physicians received special credentialing to provide sedation services above and beyond the core privileges they received for their primary subspecialty.

Given the lack of a dedicated training pathway for sedation delivery outside of anesthesia, it was not surprising that initial credentialing and the recredentialing of sedation providers was provided through a primary specialty at all institutions surveyed. In fact, most institutions allowed only certain primary specialties to provide deep sedation. Board eligibility or board certification in a pediatric subspecialty was required by most programs, whereas a small number of programs allowed board eligibility or board certification in pediatrics. Most of the survey responses showed that the requirements for initial sedation credentialing included either evidence of procedural sedation/analgesia training during fellowship or documentation of having performed a certain number of pediatric procedural sedates or documented proctoring of a certain number of sedation cases in the institution. However, no consistent pattern of requirements emerged. Most of the responses did suggest that recredentialing

required maintenance of proficiency in procedural sedation by safely performing a minimum number of sedations per year, maintenance of airways skills in the operating room, and current certification in PALS or ACLS.

Determination of level of training and provider competencies were measured in varied manners, as seen by the responses in this survey. Most programs relied on the sedation elective during fellowship training or time spent in the operating room as the basis for continuing to provide procedural sedation in the sedation program. A few require sedation providers to participate in a pediatric sedation simulation course for additional training in pediatric procedural sedation. PPS provided by simulator-trained nonanesthesiologists has been shown to enhance physician performance and safety.<sup>35</sup> One hospitalist program with proper training and oversight using a 3-tiered system of sedation providers has shown to successfully augment sedation provided by anesthesiologists.<sup>36</sup>

To minimize potential harm and provide safe sedation under TJC policies, institutions need to have uniform quality metrics and quality improvement processes.<sup>37</sup> In our survey group, most programs tracked major complications, failed sedates, and sedations that required an increased level of care. Discussion of these quality metrics among institutional sedation providers, an anesthesia quality council (if the institution has one), and nursing staff on a quarterly basis may serve to identify areas that need increased

training and to promote system characteristics that lead to sharing of best practices among the sedation providers to improve outcomes.

This study has some notable limitations. First, survey participants were selected from institutions participating in SPS and PSRC, rather than all US pediatric sedation programs. Such an approach could lead to bias in program composition. In spite of this approach, significant variation in privileging practice was seen in this subset of nationally involved sedation programs. As with all surveys, reported views and practice could differ from actual center views and practice.

## CONCLUSIONS

This survey of SPS member institutions demonstrates that variation in credentialing, training, team structure, and quality metrics for pediatric sedation providers exists. An opportunity thus exists to propose benchmarked credentialing, training, and quality standards for providers of moderate and deep procedural sedation.

Consideration should be given to developing shared educational programs to assess essential knowledge and skills that are required of an experienced sedation provider.<sup>38,39</sup> Educational programs could include clinical experience (based on requirement to provide sedation to a certain volume of patients), mentorship, proctoring, and interactive simulation-based education. Uniformity in procedural sedation training, credentialing, and tracking of quality metrics could contribute to continued improvement in sedation care.

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