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# Trial and Error: Learning From Malpractice Claims in Childhood Surgery



James M. Prieto, MD,<sup>a</sup> Bianca Falcone, MPH,<sup>b</sup>  
 Penny Greenberg, MS, RN, CPPS,<sup>b</sup> Alicia G. Sykes, MD, MA,<sup>a</sup>  
 William B. Sisson, MD,<sup>a</sup> Kenneth W. Gow, MD, MHA,<sup>c</sup>  
 and Romeo C. Ignacio, MD, MSc, MPath<sup>a,\*</sup>

<sup>a</sup> Division of Pediatric Surgery, Department of Surgery, University of California San Diego School of Medicine, San Diego, California

<sup>b</sup> Controlled Risk Insurance Company (CRICO) Strategies, Boston, Massachusetts

<sup>c</sup> Division of Pediatric and Thoracic Surgery, Department of Surgery, Seattle Children's Hospital, Seattle, Washington

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## ABSTRACT

**Introduction:** The purpose of this study was to analyze a nationwide database of malpractice lawsuits involving pediatric surgical patients to identify contributing factors in liability claims. **Methods:** Using the CRICO (Controlled Risk Insurance Company Strategies' Comparative Benchmarking System) database, malpractice claims involving patients  $\leq 18$  y old were reviewed from 2008 to 2017. Data were analyzed using descriptive statistics and logistic regression.

**Results:** Of the 844 claims, 76% of the patients were older than age 5. While the average total indemnity paid was \$544,325, cases with claimants  $< 1$ -year-old accounted for 24% of the total indemnity paid, with an average of \$1,135,240 per claimant. The most frequently named responsible services were Orthopedics (34%), General Surgery (15%), and Otolaryngology (11%). Fracture or dislocation, appendectomy, skin/breast surgery, arthroscopy, and tonsillectomy/adenoidectomy were among the frequently involved procedures for the cohort of cases. The most common contributing factors for the top procedures involve issues surrounding patient assessment, technical performance, and communication. Cases with a contributing factor of failure to appreciate and reconcile relevant sign/symptom/test results were associated with a higher likelihood of payment (OR 6.6,  $P < 0.05$ ). Issues surrounding the selection of therapy also led to an increased likelihood of an indemnity payment (OR 2.8,  $P < 0.05$ ).

**Conclusions:** Malpractice claims related to pediatric surgical procedures involve a wide range of specialties. Patient evaluations, technical performance, and communication are modifiable factors to improve surgical care in children. The contributing factors assigned to each procedure may represent an opportunity for focused improvement to improve patient outcomes.

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\* Corresponding author. Division of Pediatric Surgery, University of California San Diego School of Medicine, Rady Children's Hospital, 3020 Children's Way, MC 5136, San Diego, CA 92123. Tel.: +1 858 966 7711; fax: +1 858 966 7712.

E-mail address: [r1gnacio@health.ucsd.edu](mailto:r1gnacio@health.ucsd.edu) (R.C. Ignacio).

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## Introduction

Medical malpractice claims are a subject of interest throughout all medical subspecialties. Being sued for malpractice is not only a reflection of poor patient outcomes but can also have a negative effect on physician satisfaction and well-being.<sup>1,2</sup> Surgeons who care for children may be particularly susceptible to litigation given their vulnerable patient population and the complex nature of many pediatric surgeries. This is particularly worrisome for providers because malpractice claims involving pediatric patients are associated with higher settlements, and this seems to be escalating as the size of indemnity payments continues to increase.<sup>2-4</sup>

Malpractice claims have been known to have detrimental effects on surgeons, including increased rates of burnout, depression, and thoughts of suicide;<sup>2</sup> therefore, it is essential to understand the specific contributing factors to such liabilities to improve career satisfaction and quality of life for surgeons. Contributing factors previously associated with malpractice lawsuits are the number of hours worked, frequency of night calls, surgical subspecialty, and certain practice settings.<sup>2</sup> An in-depth review of these claims may help identify their cause and prevent future litigation. More importantly, a better understanding of malpractice litigation could be a valuable tool to improve patient safety. The purpose of this study was to analyze a nationwide database of malpractice lawsuits involving pediatric patients undergoing surgical procedures to identify contributing factors in liability claims.

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## Methods

This was a retrospective study of the CRICO (Controlled Risk Insurance Company Strategies' Comparative Benchmarking System) database. The CRICO database represents approximately one-third of all US malpractice claims from medical centers throughout the country.<sup>5</sup> The CRICO database contains over 460,000 medical malpractice claims from approximately 550 hospitals and health systems and analyzes individual practice and system factors to determine key contributors to alleged medical errors.<sup>6</sup> Claims are analyzed by clinical experts, and major contributing factors to each malpractice claim are assigned. In this study, all claims involving surgical patients  $\leq 18$  y old were reviewed from 2008 to 2017. Basic demographic data were collected for each case, along with the responsible surgical service, procedure, injury severity, indemnity payment amounts, and contributing factors.

The coding is determined based on a multitiered taxonomy structure that is designed to capture the clinical and legal variables of each malpractice claim by utilizing medical records and legal claim files. The contributing factors are designed to identify opportunities for improvement or medical errors that led to the specific patient injury or death. Examples of such factors are communication, clinical judgment, or technical skills. The records are reviewed and assigned by experienced, trained coders to ensure data integrity and consistency.

Logistic regression was performed accounting for surgical service, procedure, allegation, injury severity, claimant gender, and age to determine the contributing factors most likely to result in an indemnity payment. Age groups were divided by < 1 y, 1-4, 5-9, 10-14, and 15-18 y of age. Statistical analysis was performed using JMP Pro 15 statistical software. P values <0.05 were considered significant.

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## Results

A total of 844 claims over the 10 y studied were identified for analysis. The most implicated surgical services were Orthopedic Surgery and General Surgery, accounting for 34% and 15% of the study population, respectively. Neurosurgery and Trauma Surgery were less frequently represented but accounted for the two highest average indemnity payments respectively (Table 1). Although the average indemnity was < \$450K for Orthopedic and General Surgery cases, the payments for Neurosurgery and Trauma were > \$1.1 million dollars. The average indemnity payment per case was \$544,325 with a range of \$163K (Podiatry) to \$1.2 million dollars (Neurosurgery).

The most common age groups involved were older children between 10 and 14 (20%) and 15-18 y old (36%). Despite comprising only 12% of the population, claimants <1-year-old accounted for 24% of the total indemnity paid, with an average of \$1,135,240 per claimant (Fig. 1). Of the 844 claims, 103 (12%) involved a patient death. Claims with higher severity of patient injury were associated with an increased indemnity payment (Table 2).

The most frequently litigated procedures were treatment of a fracture or dislocation, appendectomy, skin and breast surgery, arthroscopy, and tonsillectomy/adenoidectomy (Table 3). Of the most litigated procedures, therapeutic surgery of the skin/breast resulted in the highest average indemnity payment (\$753,636), while tonsillectomy/adenoidectomy resulted in the lowest (\$176,600). The most common contributing factors to these malpractice claims were issues with patient assessment (fracture/dislocation - 45%; appendectomy - 48%; tonsillectomy - 38%; arthroscopy 24%) and technical performance (skin/breast - 70%; fracture/dislocation - 62%; arthroscopy - 54%; appendectomy - 52%; tonsillectomy - 40%).

Contributing factors associated with an increased likelihood of a malpractice claim resulting in an indemnity payment included failure to appreciate a relevant sign/symptom/test result and selection of an inappropriate therapy/procedure (Fig. 2). Factors associated with a decreased likelihood of an indemnity payment included known complications of specific procedures and the patient seeking an additional provider due to dissatisfaction with care.

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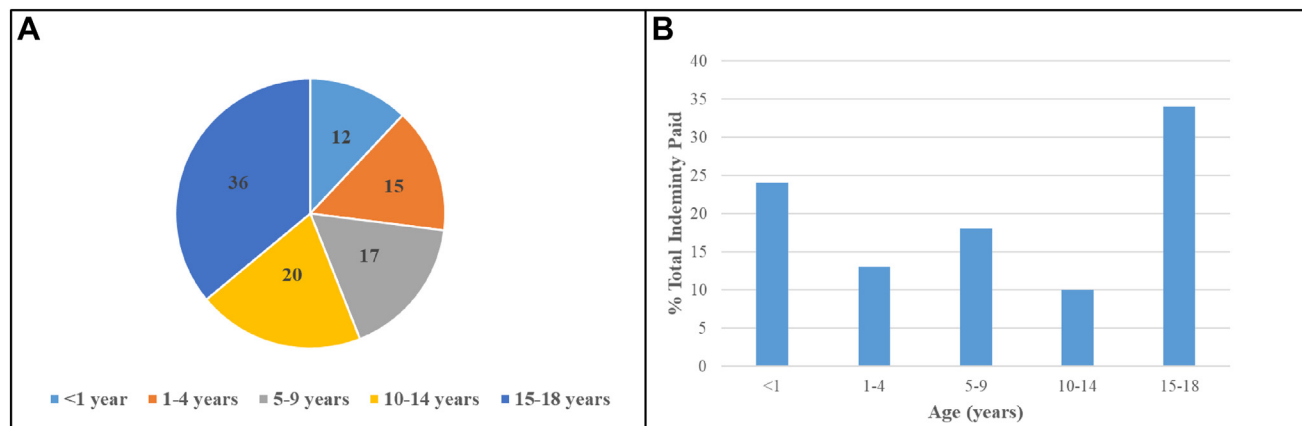
## Discussion

Malpractice claims are not only a reflection of poor patient outcomes but may also be a valuable resource for future

**Table 1 – Case number and average indemnity paid by surgical service.**

Surgical service	Number of cases	Total gross indemnity paid	Percent of total gross indemnity paid	Average indemnity paid <sup>*</sup>
Orthopedic surgery	284	\$53,205,313	30%	\$450,892
General surgery	124	\$15,594,875	9%	\$299,901
Otolaryngology	90	\$28,705,767	16%	\$717,644
Pediatric surgery	63	\$17,673,720	10%	\$841,606
Plastic surgery	62	\$9,179,874	5%	\$483,151
Neurosurgery	40	\$13,621,461	8%	\$1,238,315
Ophthalmology	40	\$7,626,918	4%	\$544,780
Urology	34	\$8,417,339	5%	\$647,488
Cardiac surgery	24	\$8,356,666	5%	\$928,518
Trauma	22	\$8,052,220	5%	\$1,150,317
Otorhinolaryngology (with plastic)	17	\$842,501	0%	\$210,625
Podiatry	12	\$818,500	0%	\$163,700
Hand surgery	9	\$358,834	0%	\$179,417
Transplant	8	\$2,800,000	2%	\$933,333
Thoracic surgery	7	\$780,000	0%	\$260,000

<sup>\*</sup> Average Indemnity Paid excludes cases without an indemnity payment.

**Fig. 1 – Study population broken down by age (A) and the total indemnity paid by age group (B).****Table 2 – Surgical cases by injury severity and respective indemnity payments.**

Severity	Number of cases	Total gross indemnity paid	Percent of total gross indemnity paid	Average indemnity paid
High	261	\$136,190,534	76%	\$1,107,240
Death	103	\$25,867,900	14%	\$574,842
Permanent significant	98	\$41,094,754	23%	\$893,364
Permanent major	44	\$43,730,630	24%	\$2,082,411
Permanent grave	16	\$25,497,249	14%	\$2,317,932
Medium	526	\$41,879,455	23%	\$218,122
Low	57	\$468,500	1%	\$36,038

**Table 3 – The most frequently litigated procedures and their respective gross and average indemnity paid.**

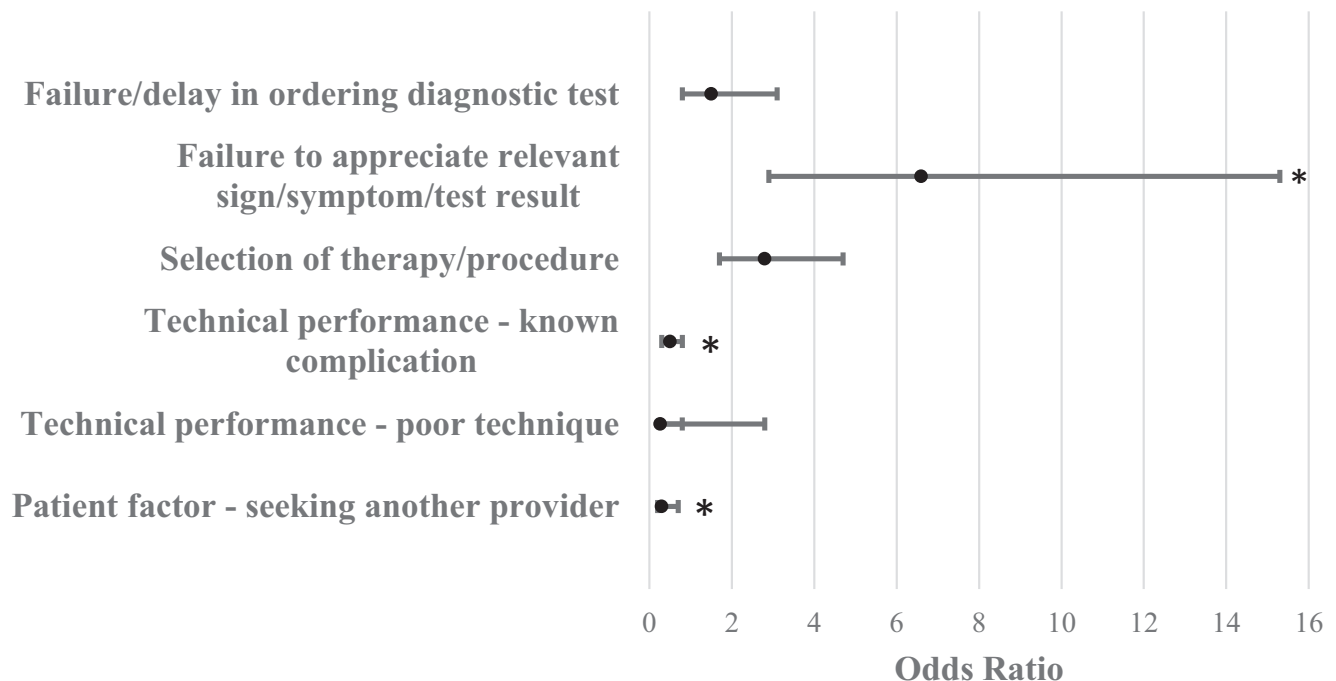
Top procedure involved	Number of cases	Total gross indemnity paid	Percent of total gross indemnity paid	Average indemnity paid
Treatment of fracture or dislocation	34	\$4,832,660	11%	\$371,743
Appendectomy	15	\$1,967,500	5%	\$491,875
Therapeutic procedures on skin and breast	15	\$2,260,909	5%	\$753,636
Arthroscopy	15	\$375,000	1%	\$187,500
Tonsillectomy and/or adenoidectomy	12	\$883,000	2%	\$176,600
Spinal fusion	10	\$725,000	2%	\$241,667
Cholecystectomy or common duct exploration	9	\$242,500	1%	\$80,833

improvement in patient safety. As part of the CRICO insurance program, the Risk Management Foundation of the Harvard Medical Institutions was founded in 1979, and has been used for over 40 y to provide an evidence-based approach to reduce medical errors and improve patient safety by reviewing and analyzing litigations and malpractice claims. Using the CRICO database, our study provides a contemporary analysis of malpractice claims involving pediatric surgery. These claims resulted in similar indemnity payments to those in adult surgery; however, this study demonstrates that younger patients account for a disproportionate amount of the cost associated with pediatric surgical litigation.<sup>7</sup> It also identifies specific procedures, which most often result in malpractice claims. Further, it highlights several modifiable factors (e.g., errors in diagnosis and procedure type) that were associated with cases resulting in indemnity payments.

Although our study demonstrates an increased frequency of malpractice claims in Orthopedic Surgery and General Surgery, it is most likely due to the higher frequency of these

pediatric procedures in relation to other subspecialties such as Neurosurgery and Trauma. The CRICO database allows for the analysis of many claims from numerous hospitals, but it does not capture the total number of cases within its program. Therefore, it is difficult to determine the exact frequency of litigation for each specific procedure. However, the impetus of our study was not to evaluate the frequency of litigation for each subspecialty or specific procedure, but rather to focus on modifiable factors to improve patient outcomes.

Failure to appreciate a sign, symptom, or relevant test result was identified as a major contributing factor associated with a higher likelihood of an indemnity payment. Errors in diagnosis have many possible causes depending on the condition or surgical service involved. Potential strategies to avoid these errors include performing routine continuous medical education, systematic discussion of errors to highlight common pitfalls, and establishing standardized pathways that will leverage best practices in order to establish correct diagnoses and deliver appropriate treatment in a timely



**Fig. 2 – Forest plot of the top 6 contributing factors to malpractice claims in childhood surgery. Error bars represent the 95% confidence intervals. An “\*” denotes a P value < 0.05.**

fashion.<sup>8</sup> These proactive strategies can also help to avoid the practice of ‘defensive medicine’, in which unnecessary tests are ordered to prevent a diagnostic error. This practice can lead to wasteful healthcare expenditure and cause increased patient discomfort and anxiety.<sup>9</sup> The implementation of protocolized pathways in the treatment and diagnosis of the most common surgical diseases can help to avoid common errors and manage patient expectations. This is especially important considering that common diseases and procedures were some of the most frequently litigated cases in this study. Managing patient expectations are critical to implementing these changes. Protocols designed to decrease the use of unnecessary diagnostic tests and reduce costs may lead to patient dissatisfaction if they are not well understood.

These data also demonstrate that when patients sought another provider due to dissatisfaction with their care, claims were less likely to result in an indemnity payment. The involvement of another physician for a ‘second opinion’ may be a protective factor in malpractice claims. This emphasizes the importance of collaboration and communication among practitioners to optimize patient care and should be considered, especially in challenging clinical cases. Educating providers to encourage their patients to seek a second opinion when they sense any dissatisfaction or confusion may help to avoid litigation in the future. And for providers that lack a colleague who may be able to provide this assistance, it is encouraged for that provider to reach out to other regional or nationally recognized experts who could also provide a valuable consideration of the case.

This study is subject to limitations inherent in using a large, retrospective database. The database used contains a significant portion of all malpractice claims in the United States, but it is not all-inclusive, and may be subject to additional selection bias. Additionally, the study lacks granular clinical data specific to each case, which does not allow for a more detailed analysis of the surrounding circumstances and outcomes in each claim. As an example, the failure to appreciate a sign, symptom, or test result was highlighted as a major contributing factor in many of the malpractice claims. This could conceivably refer to errors made not only by surgeons, but also by other members of the healthcare team. Many of these errors may, in fact, fall under opportunities for improvement in communication. As previously mentioned, CRICO collects data for procedures involved in malpractice claims but is unable to determine the total number of cases performed in all hospitals. Therefore, the number of litigations per subspecialty or procedure may only reflect the increased frequency of each case. Lastly, the review provided information specific to the case but did not provide information regarding the surgeon involved, which might have provided more factors to consider such as fellowship training, board certification, years in practice, or size of the practice.

### Conclusions

Malpractice claims may represent an opportunity for focused quality improvement within surgical services and other health systems. Educational programs in patient diagnosis, technical skills, and communication should be

tailored to the specific subspecialty and procedure. Understanding these contributing factors that may lead to litigation, and training surgeons to minimize such complications will improve surgical care and patient safety for children undergoing surgery.

### Author Contributions

J.M.P. and R.C.I. conducted the literature search. J.M.P., A.G.S., W.B.S., K.W.G., and R.C.I. were responsible for the study concept and design. J.M.P., B.F., P.G., and R.C.I. acquired and analyzed the data. J.M.P., B.F., P.G., A.G.S., W.B.S., K.W.G., and R.C.I. participated in drafting the article and critically revising it. All authors approved the final version of the manuscript.

### Disclosure

Dr. Ignacio is an Associate Editor for the Journal of Surgical Research; as such, he was excluded from the entire peer-review and editorial process for this manuscript.

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