

# PEDIATRIC MENINGITIS CLAIMS

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## INTRODUCTION

Historically, meningitis has featured prominently in allegations of pediatric medical professional liability. While other physician specialties (e.g., general and family practice, emergency medicine) are often implicated in meningitis claims, for pediatrics, meningitis is one of the most expensive medical conditions for both average indemnity and defense costs. And these already high pediatric claim costs have risen by 14% in the 10-year period from 2001-2010, according to the Physician Insurers Association of America (PIAA). Pediatric meningitis claims frequently ensue from a patient death or severe permanent neurological impairment – and infants and toddlers are involved in significant numbers.<sup>1</sup>

The most volatile medical professional liability litigation currently involves severely injured children in obstetric and pediatric scenarios. Some of the largest verdicts and settlements in the U.S. over the last five years have occurred in pediatric cases; in many instances, exceeding \$5 million. The specialties of pediatrics in medical practice, and children's hospitals in acute care facilities, have some of the highest severity in medical and hospital professional liability claims.<sup>2,3</sup>

In the category of low frequency/high severity, four types of recurring pediatric cases are especially problematic: 1) meningitis, 2) **malrotation of the bowel/volvulus**, 3) **retinopathy of prematurity (ROP)** and 3) **kernicterus**. In these cases, verdicts and settlements are often in multiple millions of dollars due to the degree of impairment and the



The meninges are three layered membranes, one within the other, that support the spinal cord and brain. From outside in, the three layers consist of the dura mater, the arachnoid, and the pia mater. The two innermost layers of the meninges comprise the area known as the subarachnoid space, which contains cerebrospinal fluid (CSF). CSF circulates slowly around the brain and spinal cord.

need for lifetime care. The emotional impact on a jury of a deceased or severely injured child is just one factor contributing to multi-million dollar verdicts and settlements against pediatricians and children's hospitals. Another is improved medical care for severely injured children – i.e., more expensive care over more years. Life care plans for children are costly and the current low investment returns obviate any advantages to using annuities to resolve these cases.

Meningitis and malrotation of the bowel cases frequently are made on allegations of misdiagnosis and/or delayed treatment. Children presenting with fevers or abdominal pain can be notoriously difficult to diagnose. These cases can involve errors in clinical judgment and in communication, as well as system breakdowns, such as failure to manage critical test results. But sometimes, even with timely and appropriate care, the disease progresses so rapidly that the outcome is catastrophic. Unlike retinopathy of prematurity and kernicterus, no guidelines have been promulgated by the American Academy of Pediatrics for the diagnosis and treatment of meningitis.

This article addresses issues in pediatric meningitis claims. The PIAA has published two special reports on meningitis claims against treating physicians, one in the year 2000 and one in 2012. No other pediatric condition has warranted this heightened attention. Both reports are cited, and a portion of the 2012 report is used herein with permission.

Claims involving pediatric meningitis, like all claims concerning severely injured children, generate deep concern among treating hospitals, pediatricians, family practice physicians and emergency medicine physicians. Health care professional liability insurers and reinsurers are intensely focused on these types of cases because of the long history of high verdicts and settlements. **As hospitals and health care systems increasingly employ primary care physicians, including pediatricians, they are much more exposed to liability for diagnostic errors.**

## MENINGITIS: MEDICAL FACTS

Meningitis is a term describing the inflammation of the meninges of the central nervous system. The condition is caused most frequently by an infectious agent and much less commonly by medication or a malignancy.<sup>4</sup>

Meningitis usually occurs as a complication from an infection in the patient's bloodstream. While the blood-brain barrier ordinarily protects the brain from contamination by microorganisms in the blood, sometimes infections release substances that reduce this protective function. Once the blood-brain barrier is compromised, a chain reaction occurs that can lead to increased inflammation, especially of brain tissue. The brain tissue can swell causing a decrease of blood to vital portions of the brain.<sup>5</sup> Death or severe permanent neurological impairment often results.

### VIRAL MENINGITIS

The most common cause of meningitis is a viral infection. This is known as viral meningitis and is often caused by such viruses as enteroviruses and herpes simplex viruses, though many types of viruses can cause meningitis.<sup>6</sup>

The term viral meningitis is often used interchangeably with the term aseptic meningitis, but they are not synonymous. Aseptic meningitis can have other causes that are not viral. Viral meningitis is much more prevalent clinically but historically is far less associated with health care professional liability claims.<sup>7</sup>

Other microbiologic causes of meningitis include bacteria, parasites and fungi.<sup>8</sup>

## BACTERIAL MENINGITIS

Bacterial meningitis, much more serious than viral meningitis, is defined as an infection of the arachnoid mater, subarachnoid space, and the CSF.<sup>9</sup> One of the most serious infections in infants and children, it is often associated with severe complications and rapid death, making timely diagnosis and treatment crucial.<sup>10</sup> The symptoms of meningitis can develop over several hours or over one to two days. Bacterial meningitis is a true pediatric emergency.

Cases of bacterial meningitis in children present the greatest risk for medical professional liability.

The occurrence of bacterial meningitis is most affected by patient age, with the highest incidence of meningitis being seen in children between birth and age two. Neonates (first 30 days of life) and infants three to eight months are at greatest risk.<sup>11</sup>



Acute cases of bacterial meningitis can result in significant morbidity, including profound neurological impairment and mortality despite appropriate and timely antibiotic therapy. Even with appropriate antibiotic therapy, the mortality rate for bacterial meningitis is 5-10%. Of the children who survive, approximately 15-25% will have long-term morbidities, including seizure disorders, spasticity, hearing loss and developmental delay.<sup>13</sup>

Various types of bacteria can cause bacterial meningitis, and certain age groups of children are more susceptible to infection from specific types of bacteria. Neonates are most at risk for group B *Streptococcus*, *Escherichia coli*, and *Listeria*. After the neonatal period, children are most susceptible to *Streptococcus pneumoniae*, *Haemophilus influenzae* type B (Hib) and *Neisseria*. However, the widespread use of the Hib vaccine for infants, beginning in the 1990s, has dramatically and favorably decreased the incidence of meningitis caused by Hib.<sup>12</sup>

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## SYMPTOMS

Symptoms suggestive of meningeal inflammation or increased intracranial pressure are also observed with other central nervous system infections (most often viral). Children who present with bacterial meningitis usually have a fever, but the absence of a fever in the presence of other symptoms indicating meningeal inflammation does not preclude a diagnosis. Symptoms of meningeal inflammation can be minimal or absent entirely in a very young infant.<sup>14</sup> A recent study published in 2010 concluded: “No clinical feature [of pediatric bacterial meningitis] is diagnostic in isolation and the most accurate combination of clinical features to raise or lower suspicion of meningitis is still unclear.”<sup>15</sup>

Clinical features suggestive of meningitis in infants younger than three months of age may include some of the following:

- Fever
- Increased irritability
- Increased lethargy
- Decreased liquid intake
- Vomiting
- Rash
- Stiff neck
- Bulging fontanelle (soft spot on the top of the head)
- Seizures

Clinical features suggestive of meningitis in children older than one year of age may include some of the following:

- Fever
- Nausea and vomiting
- Headache
- Photophobia (sensitivity to light)
- Altered mental status (confusion)
- Lethargy

- Seizures
- Neck stiffness or pain
- Rash
- Knees automatically draw up towards the body when the neck is bent forward or pain in the legs when bent (called Brudzinski's sign)
- Inability to straighten the lower legs after the hips have been flexed (called Kernig's sign)<sup>16</sup>

## TREATMENT

Once meningitis is suspected, a lumbar puncture (LP) is performed in order to measure the opening pressure and examine the CSF. The LP is invasive and painful and performing one is neither indicated nor practical on every child who presents with a fever or other nonspecific symptoms. The child's clinical presentation should determine the amount of additional data needed before making a decision to treat.<sup>17</sup> Since bacterial meningitis is a life-threatening condition, treatment may begin before all of the tests are done or the results known. Inpatient admission will occur and depending on the degree of illness, some or all of these measures will be instituted: intubation, monitoring, IV fluids, antibiotic therapy, other medications as indicated and steroid administration.<sup>18</sup> Cerebral perfusion and managing increased intracranial pressure are essential to prevent morbidity and mortality.<sup>19</sup>

## MEDICAL-LEGAL ISSUES

Bacterial meningitis constitutes a pediatric emergency and requires timely diagnosis and aggressive treatment. Bacterial strains can advance rapidly leaving little time for beneficial therapy. But accurate and timely diagnosis of bacterial meningitis in children remains a major challenge at present, and this creates concomitant challenges in the defense of litigation. A diagnosis of meningitis can be difficult to make because patients with bacterial meningitis often

have very subtle, if any, presenting symptoms and because its symptoms often mimic influenza or an isolated infection. Pediatricians and other treating physicians now see bacterial meningitis cases less frequently due to the advent of the Haemophilus, pneumococcal, and meningococcal vaccines. This makes the diagnosis even more challenging since it is seen so rarely.

The PIAA Meningitis Study from November 2000 is still instructive and includes the following findings:

- The initial contact by the patient/caregiver was by telephone in 17.8% of all cases but claims based on those cases were more than twice as expensive to resolve as claims based on cases where initial contact occurred in the doctor's office.
- In two-thirds of the claims, the initial diagnosis of meningitis was made within 48 hours of initial contact with the provider, but patients died in 60.3% of those cases.
- A key factor was delayed physician response time, which contributed to the delay in diagnosis. This led to higher indemnity payments. Delays included:
  - Not responding to a medical call or request (particularly involving a phone call from a caregiver)



- Delay in performing or failure to perform a diagnostic procedure (often the LP, 23.3%)
- Delay in hospital admission
- Delay in administering antibiotics
- A common diagnosis was “viral illness,” such as an upper respiratory infection or ear infection.<sup>20</sup>

The PIAA issued another report on meningitis claims in February 2012. Note that these are studies of physician claims only and thus the indemnity payments are almost always under \$1 million. Many verdicts and settlements do in fact exceed \$1 million. As hospitals employ more primary care specialists that see children, the insurance limits exposed to pay claims for diagnostic errors are much greater than for an individual physician policy.

## THE PIAA CLOSED CLAIMS DATA 2012

According to the PIAA Data Sharing Project (DSP), meningitis remains among the top five most prevalent medical conditions in the database for those claimants 0-18 years of age. It ranked second highest in the DSP from 1985-2010, though it dropped slightly to fourth highest in the last 10 years (2001-2010). There were a total of 400 closed claims for meningitis as the presenting condition in the entire database, noticeably reducing the number of claims filed as the years go by. From 1991-2000 there were 183 closed claims reported for meningitis. This number decreased approximately 59% to 75 total closed claims in the most recent 10 years (2001-2010).

Figures 1 and 2 show the breakout of the presenting condition category groups named in the DSP for meningitis in claimants aged 0-18 years. For the aggregate data (Figure 1), meningitis unspecified encompasses 62% of the total 400 closed claims, followed by bacterial meningitis (33%) and viral meningitis (5%). However, in the last 10 years (figure 2), data shows bacterial meningitis covers

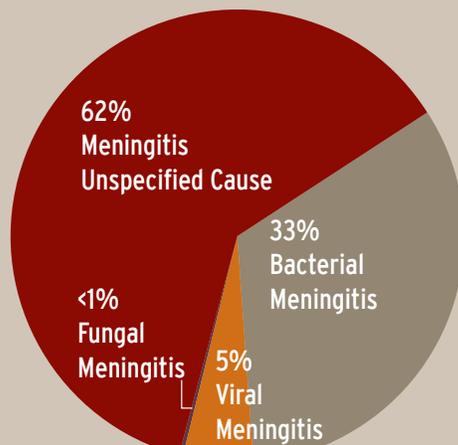
64% of the 75 closed claims with a 43.8% paid-to-closed ratio and an average indemnity payment of \$633,016.

Table 1 lists the top five alleged errors for meningitis in claimants aged 0-18 from 2001-2010: diagnostic errors, no medical misadventure, improper performance, failure to properly respond, and failure to recognize a complication of treatment. Four out of the top five errors deal with performance-related issues signifying the complexity of diagnosing and treating meningitis correctly in children.

Diagnostic errors had the highest reported number of closed claims in claimants aged 0-18 for meningitis, with a total of 48 closed claims where 22 were paid (45.8% paid-to-closed). It also had the most expensive indemnity payment totaling more than \$12 million, with the top two misdiagnoses: viral infection in conditions classified elsewhere and upper respiratory infection of undeterminable site.

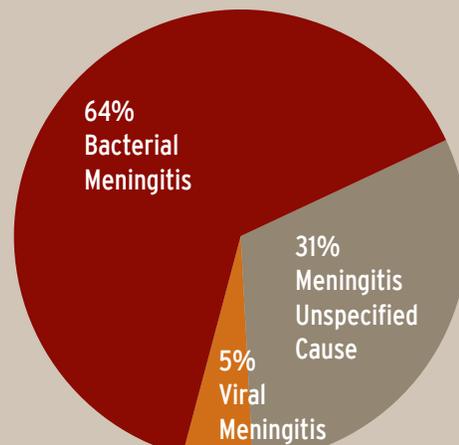
Although minimal in claims, a failure or delay in performance or treatment almost always results in an indemnity payment. Failure to timely perform a lumbar puncture or initiate antimicrobial therapy could lead to adverse clinical outcomes and expensive liability claims. A retrospective study on bacterial meningitis in a hospital emergency room setting showed mortality was indeed higher

**Figure 1: Condition Category Groups of Meningitis from 1985-2010 in Claimants Aged 0-18 Years (N=400 Closed Claims)**



Source: PIAA Data Sharing Project

**Figure 2: Condition Category Groups of Meningitis from 2001-2010 in Claimants Aged 0-18 Years (N=75 Closed Claims)**



Source: PIAA Data Sharing Project

**Table 1: Top Alleged Errors for Meningitis in Claimants Age 0-18 Years (2001-2010)**

ALLEGED ERROR	CLOSED CLAIMS	PAID CLAIMS	PERCENT PAID	TOTAL INDEMNITY	AVG INDEMNITY
Errors in diagnosis	48	22	45.8	\$12,491,000	\$567,773
No medical misadventure	11	4	36.4	\$5,033,333	\$1,258,333
Improper performance	3	-	-	-	-
Failure to properly respond	3	1	33.3	\$384,000	\$384,000
Failure to recognize a complication of treatment	3	1	33.3	\$90,000	\$90,000

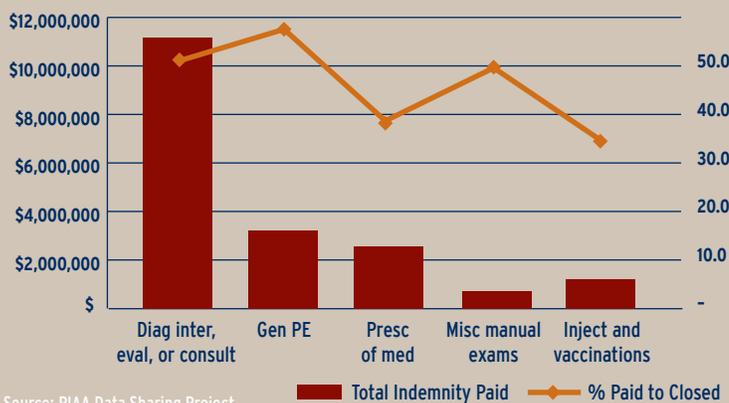
in delays longer than two hours.<sup>21</sup> However, delays occur because meningitis is not always considered when the patient presents with flu-like symptoms.

Of the 75 closed claims for meningitis in claimants aged 0-18 years in the last 10 years (2001-2010), the majority of cases reported death, major permanent injury and grave degree of injury respectively. Although death had 30 closed claims, major permanent injury had the highest paid-to-closed ratio (52.4%) and the highest indemnity payout (\$10.2 million).

The most expensive procedures and the total indemnity payment for claimants aged 0-18 years with meningitis for the years 2001-2010 are illustrated in Figure 3. Diagnostic interview, evaluation, or consultation had a total of 27 closed claims, where 14 were paid (51.9% paid-to-closed), and a total indemnity greater than \$11 million.

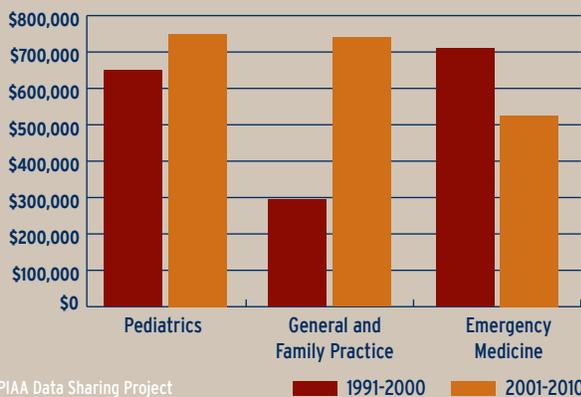
The top medical specialties and their average indemnities (constant dollars) in the past 20 years in 10-year increments: 1991-2000 and 2001-2010 for meningitis in 0-18 year olds are pediatrics, general and family practice, and emergency medicine (Figure 4). These values were adjusted for inflation. Within claims reported for pediatrics and general and family practice, the average indemnities were greater in the most recent 10-year period by 14% and 60% respectively. In contrast, emergency medicine had a 26% decrease. Pediatrics had a total indemnity of \$14.4 million in 2001-2010, the highest among all medical specialties treating this condition.

**Figure 3: Most Expensive Procedures, Closed Claim Data for Meningitis in Claimants Age 0-18 Years (2001-2010)**



Source: PIAA Data Sharing Project

**Figure 4: Medical Specialties with Majority of Reported Claims; Average Paid Indemnity Closed Claim Data: 1991-2000 vs. 2001-2010 for Meningitis (2010 dollars)**



Source: PIAA Data Sharing Project

## RISK MANAGEMENT CONSIDERATIONS

### THE PROBLEM

Timely recognition and treatment is essential for pediatric patients with bacterial meningitis. The difficulty in accomplishing this is, as one pediatric emergency medicine physician aptly said, “Sometimes it (meningitis) is very easy to diagnose and sometimes it is impossible to diagnose.”<sup>22</sup>

Neurologic signs and symptoms are often not

seen at presentation, yet much pathology can occur prior to their onset. McAbee et al. state, “There is no such thing as too high an index of suspicion for meningitis, especially for infants and young toddlers during ‘flu’ season.”<sup>23</sup> For the pediatrician, this is especially true if the patient’s symptoms worsen, do not resolve within 24 hours, or new symptoms appear.

## HOSPITAL EXPOSURE

Pediatricians, like other primary care physicians, are increasingly joining the ranks of hospital and health system employees. Nursing staff, including nurse practitioners, are seeing more children as patients. Hospitals are therefore now more exposed to the most common types of claims against pediatricians: failure to diagnose or delay in diagnosis. Hospital risk management strategies must take this into account.

## TOOLS

In many pediatric meningitis cases in the PIAA reports, the initial contact by the parent or caregiver was by telephone. Good risk management of pediatric meningitis requires tools – such as pediatric telephone triage protocols and pediatric discharge instructions that address the progressive symptoms of meningitis requiring a return visit. Nonclinical staff (e.g., receptionists and nurse aides) should not provide clinical advice to parents and caregivers, especially not over the phone. Periodic monitoring of the application of telephone triage in the office practice is essential to ensure adherence to protocols.

## COMMUNICATION

Communication problems contribute to liability for meningitis claims: poor communication with parents and caregivers of follow-up instructions; poor communication between providers, e.g. nurse and physician; failure to give a referral or consulting physician a thorough account of medical findings and history to date and to inform them of problems with critical test results.<sup>24</sup>

In discharge instructions, clearly inform parents or caregivers that there is reason to conclude that the child does not have meningitis, but that meningitis can evolve over a period of time and that they should call, return or take the child to the Emergency Department as appropriate.

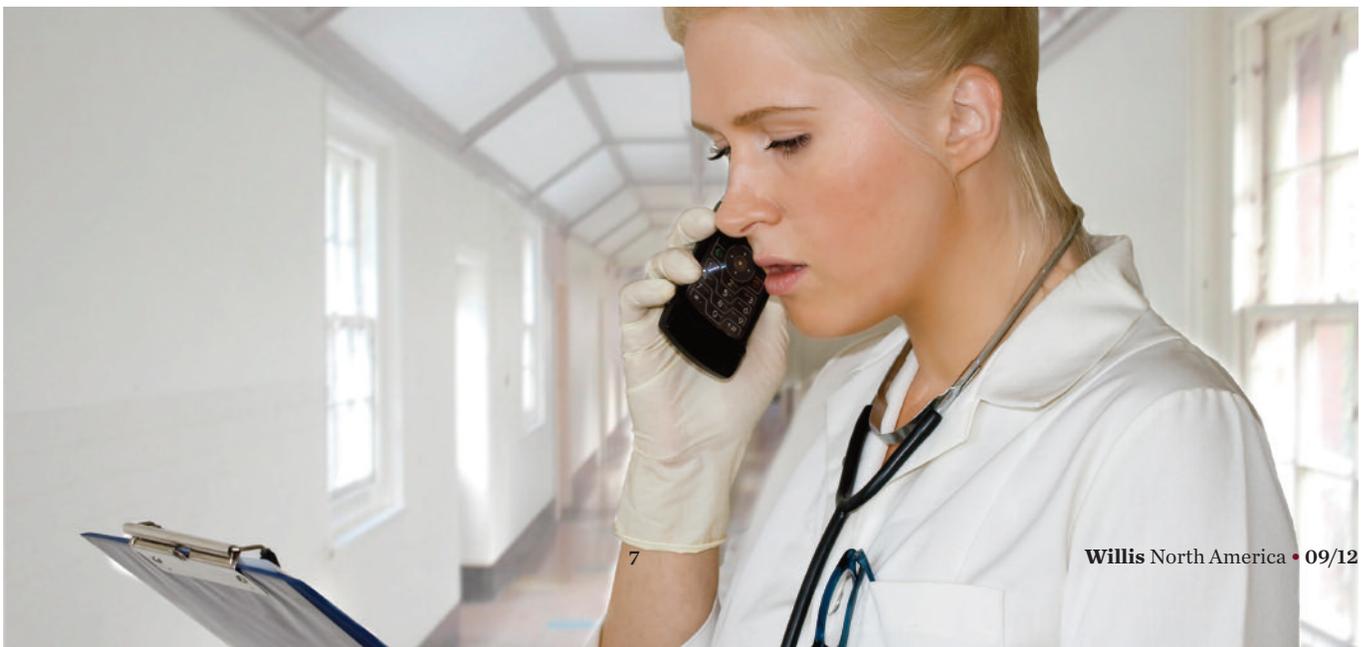
## DOCUMENTATION

Another issue in pediatric meningitis claims concerns documentation problems, such as failure to record relevant negative findings (especially given that the presentation of this disease can be subtle to nonexistent), failure to document conversations with the parents or caregivers, and failure to document referrals to other physicians.<sup>25</sup>

## DEFENSE CONSIDERATIONS

One of the most important and frequently raised allegations in pediatric meningitis cases is that of a delay in treatment affecting the patient’s outcome.

The allegations often target the relationship of the duration of the patient’s symptoms to the outcome. For example, a pediatrician or emergency medicine physician sees a child with a nonspecific clinical presentation on Monday; the patient is then diagnosed with meningitis on Thursday. This does not necessarily constitute a negligent delay in diagnosis.<sup>26</sup> The successful defense of such a case depends on the patient’s presenting symptoms and, more importantly, on the adequacy of the supporting documentation, especially any pertinent negatives, such as the absence of Kernig’s and Brudzinski’s signs.



## CONCLUSION

Great strides have been made in the prevention of bacterial meningitis thanks to vaccine development. Bacterial meningitis is seen more rarely in the office and emergency department, but this makes it even more of a challenge to diagnose it in an accurately and timely manner. The child's initial presentation symptoms may be subtle to nonexistent. Pediatric telephone triage protocols in the pediatrician's office; clear discharge instructions, especially describing symptoms requiring urgent follow-up; and thorough documentation of the pediatric patient's physical exam can help prevent pediatric meningitis claims, which often end in multi-million dollar settlements and verdicts.

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*The observations, comments and suggestions we have made in this report are advisory and are not intended nor should they be taken as medical/legal advice. Please contact your own medical/legal adviser for an analysis of your specific facts and circumstances.*

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