



The Malpractice Experience of Neurosurgeons 2014–2019: Patient Selection and Communication May Mitigate Risk of Claims

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Introduction

With over 80,000 members, The Doctors Company is the largest physician-owned medical malpractice insurer in the United States. Its mission is to advance, protect, and reward the practice of good medicine. To achieve this, The Doctors Company studies malpractice claims to better appreciate what motivates patients and their families to pursue claims, and to gain a broader overview of system failures and processes that result in patient harm. Based on these studies, The Doctors Company advises healthcare professionals regarding risk mitigation approaches to improve patient safety.

To assist medical practices in today's complex healthcare environment, The Doctors Company provides specialty-specific evaluations of malpractice risks. Although neurosurgeons treat various ailments, there are six general categories of neurosurgical diseases: cerebrovascular, functional, tumors, spine, trauma, and pediatric. Many cerebrovascular diseases can require surgical intervention, including cerebral aneurysm, spontaneous intracranial or subarachnoid hemorrhage, hypertensive intracerebral hemorrhage, and arteriovenous malformation. Each of these surgeries can have serious complications, even if all care provided falls well within the standard of care. Therefore, it is a best practice for risk mitigation for neurosurgeons to be especially mindful of patient selection, and then to participate in a true informed consent discussion that addresses the risks, benefits, and potential known complications of the procedure in question.

In February 2021, The Doctors Company conducted an analysis of claims against neurosurgeons that closed between the years of 2014 and 2019. This evaluation included 302 claims and lawsuits. The claims experience of neurosurgeon members of The Doctors Company was then benchmarked against a national sample of other neurosurgeons.

Study Design

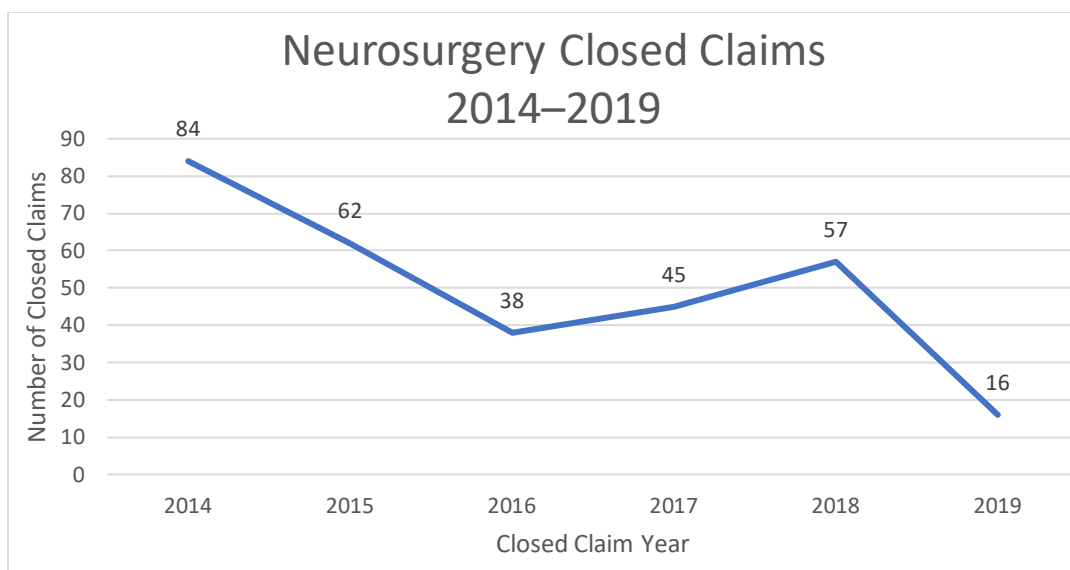
This was a cross-sectional, descriptive analysis with The Doctors Company’s data using the CRICO Comprehensive Risk Intelligence Tool (CRIT). The variables were obtained from closed claims that were reviewed by trained clinical analysts and entered into a database that uses a structured taxonomy. This taxonomy provides various levels of specificity based on the variable. These levels can include category (broad), subcategory (more specific), and/or detail (specific). The variables of interest to this study will be explained in more detail.

The analysis was descriptive for the characteristics of claims based on closed claim years from 2014 to 2019 in which a neurosurgeon was listed as the primary responsible specialty. Variables examined included the case types (allegations), initial and final diagnoses, procedures, injuries, sites, locations, severity, comorbidities, contributing factors, indemnities, and expenses paid.

Findings

Years

Over the studied six years of closed claims (2014–2019), there was a downward trend in the number of closed claims against neurosurgeons.



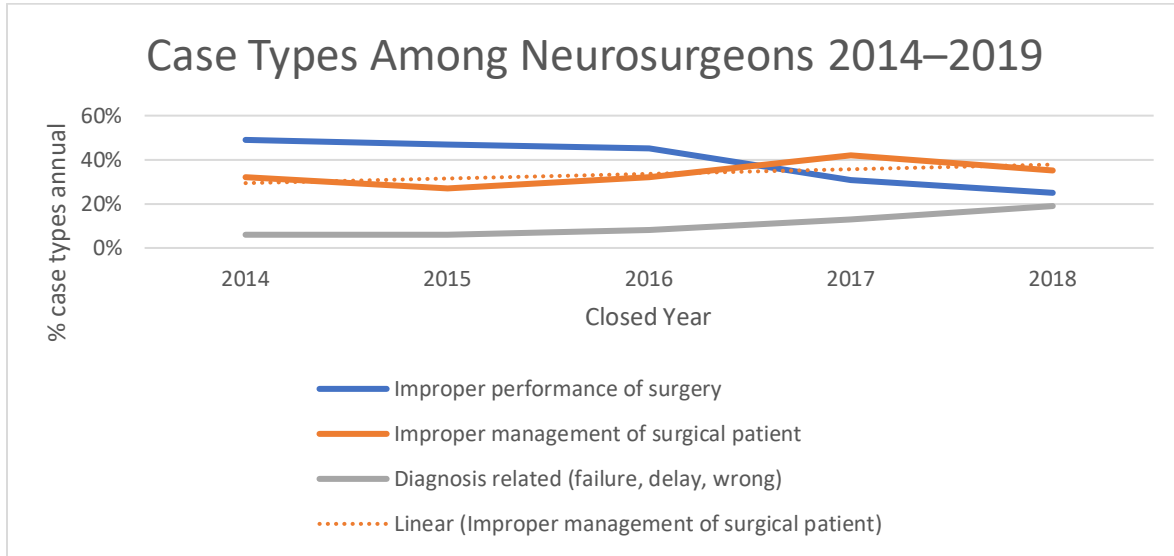
Major Case Types

The two most common major case types (also referred to as allegations) were related to surgery: improper performance of surgery (n=122; 40 percent) and improper management of the surgical patient (n=101; 33 percent). The diagnosis-related case type was a distant third, with 29 claims representing 10 percent of claims studied.

In differentiating between the two top surgical case types, describing where incidents tend to occur is a helpful first step. With improper performance of surgery, technical issues from the procedure are more evident, as incidents that would lead to this case type occur in the operative or procedural setting, whereas in the management of the surgical patient, the issue could be found anywhere along the surgical continuum, from the preoperative stage to postoperative management. Diagnosis-related case

types can include the failure to diagnose, a misdiagnosis, or a delay in diagnosis. Incidents that lead to allegations of this diagnosis-related case type may be singular or cumulative, and may occur anywhere along the continuum of care.

Over the six-year study period, both improper management of the surgical patient and diagnosis-related case types showed a slight increase in claims, whereas improper performance of surgery case types showed a downward trend.



Procedures

Procedures were included in this analysis if the procedure itself was directly related to the patient’s injury. In 82.2 percent of the claims (n=245), procedures were noted in the reviews. Fusions of the spinal column were the most common procedure involved in neurosurgery claims.

When examining how specific procedures were coded, the exploration and decompression of the spine, which is typically part of fusions of the spinal column, appeared in the largest number of claims (n=53). Lumbar and lumbosacral fusion of the anterior column using a posterior technique was the second-most common procedure seen in this analysis (n=29). The excision of an intervertebral disc and a cervical fusion using an anterior technique represented 10 percent and 9 percent of the claims, respectively (n=24 and n=23).

Severity

Severity was measured using the patient injury severity code based on the National Association of Insurance Commissioners (NAIC) Injury Severity Scale. Fifty-six percent of the neurosurgeon claims had a medium severity assigned to them, followed by 40 percent of studied claims involving injuries of high severity.

NAIC Injury Severity Scale	Descriptions
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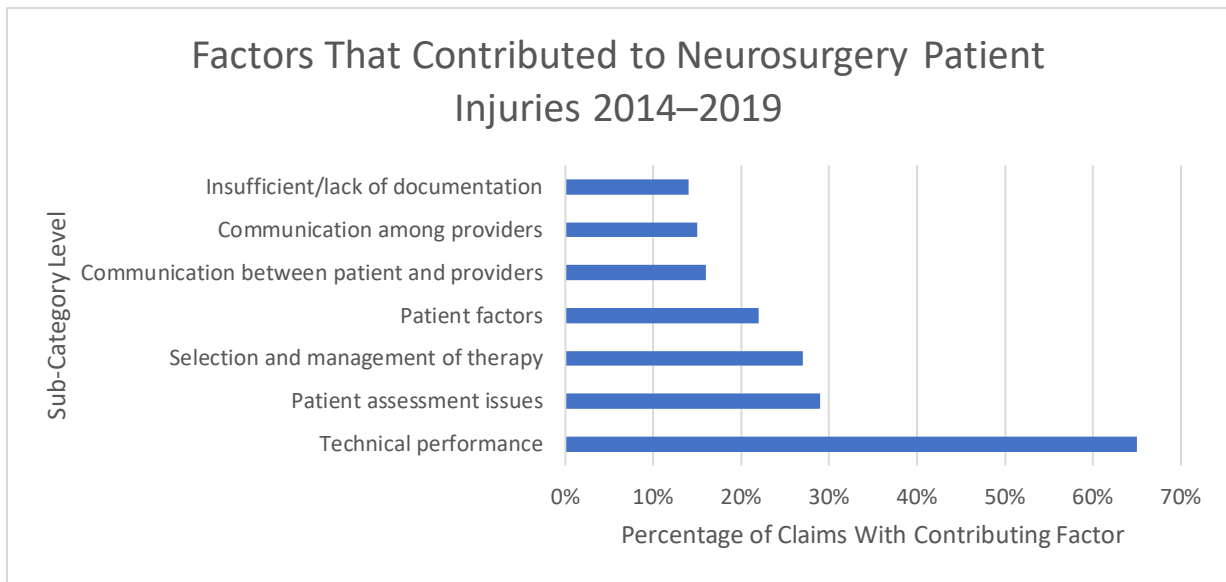
Low Severity	
1. Emotional only	
2. Temporary insignificant	Lacerations, contusions, minor scars, rash, no delay in recovery
Medium Severity	
3. Temporary minor	Infections, fractures, missed fractures, recovery delayed
4. Temporary major	Burns, surgical material left in patient, drug side effect, recovery delayed
5. Permanent minor	Loss of fingers, loss or damage to organs, nondisabling injuries
High Severity	
6. Permanent significant	Deafness, loss of limb, loss of eye, loss of one kidney or lung
7. Permanent major	Paraplegia, blindness, loss of two limbs, brain damage
8. Permanent grave	Quadriplegia, severe brain damage, lifelong care or fatal prognosis
9. Death	

Contributing Factors

Contributing factors are described using three levels in the taxonomy structure, from the broad to a detailed description. In this study, two levels of the taxonomy were explored: the subcategory and the detail levels. The number of contributing factors that can be included in the analysis of claims is unlimited, provided there is evidence to support their use. These contributing factors are also delineated along conceptual lines, such as administrative, clinical judgment, documentation, technical skills, and communication, to enhance the ability to target patient safety interventions.

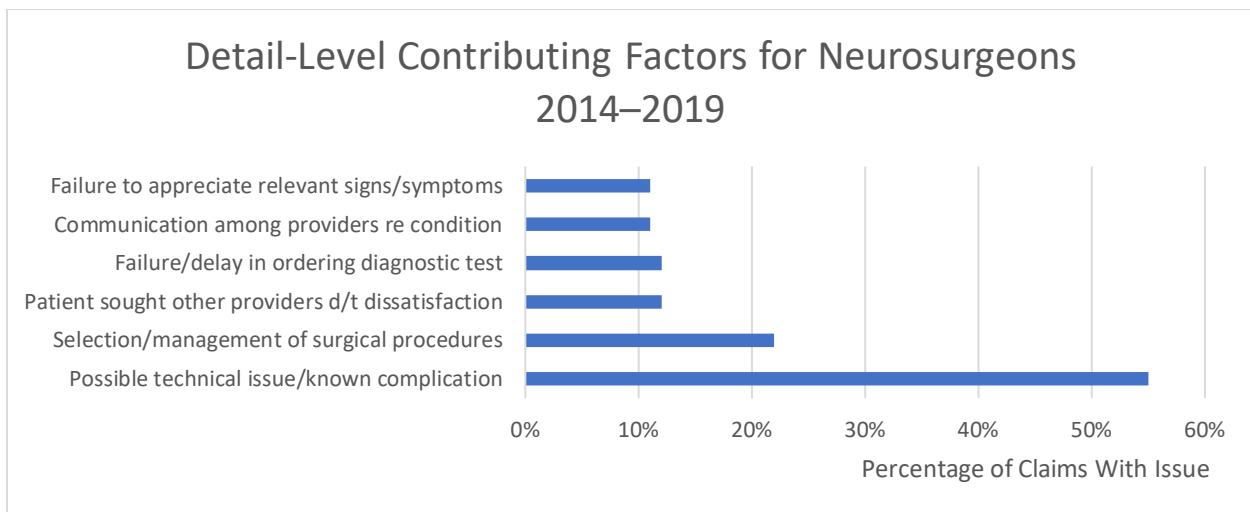
At the subcategory level for neurosurgeons, technical performance contributing factors were seen in 65 percent of the claims (n=193). Patient assessment issues (clinical judgment) were evident in 29 percent of the claims (n=87), and the selection and management of therapy (clinical judgement) was found to be a contributing factor in 27 percent of the claims (n=80). Patient factors, often described as nonadherence, were seen in 22 percent of the claims (n=65). Communication was also an issue, with communication between the provider and patient/family appearing in 16 percent of the claims (n=49) and communication among providers appearing in 15 percent of the claims (n=44). Fourteen percent of the claims (n=43) referenced insufficient documentation.

Factors That Contributed to Neurosurgery Patient Injuries 2014–2019



When examining contributing factors at the detail level, technical skill remains at the top, with a known complication found in 55 percent of the cases studied. Three clinical judgment issues are in the top tier of detail-level contributing factors: selection and management of surgical/invasive procedures; failure/delay in ordering diagnostic tests; and failure to appreciate signs, symptoms, and test results.

Detail-Level Contributing Factors for Neurosurgeons 2014–2019



Further analysis was completed on some of the detail-level contributing factors. Approaching the allegation of failure or delay in ordering a diagnostic test (n=35), the diagnostic test involved was explored. Forty-six percent of these claims involved CTs (n=16), and 29 percent included MRIs (n=10). Among diagnostic tests that were misinterpreted (n=19), MRIs (n=7) and CTs (n=7) were also the most noted.

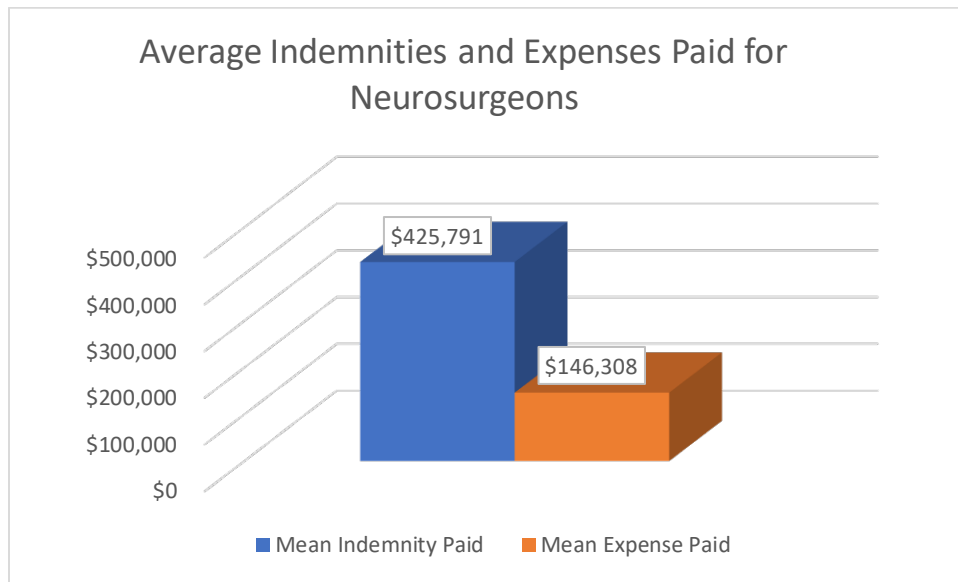
In considering case types involving failure/delay to order and/or misinterpretation of a diagnostic test, it was found that 26 percent of the improper management of a surgical patient claims included CTs that

were delayed/not ordered, and 22 percent of cases alleging improper performance of surgery included CTs that were delayed/not ordered. Diagnosis-related claims revealed the highest incidence (n=3) of MRIs being delayed/not ordered.

Incorrect body site was noted as an injury in 20 claims (7 percent), so the sites were investigated. Sixty-five percent of the sites applied to the spinal column, with the lumbar region (n=6) and cervical region (n=4) having the higher incidence.

Expense and Indemnity Payments

Thirty-two percent of the neurosurgery claims (n=94) had a paid indemnity. The average indemnity paid for these claims was \$425,791, with average expenses of \$146,308. The median (or the spread) was \$230,000 for indemnities paid and \$104,475 for expenses.



Examining the expenses and indemnities by case type illustrated that the failure to treat was the case type with the largest average indemnity—but with only one claim studied, this should be viewed as a skewed statistic. The other top case types are included in the table below.

Case Type	Mean Expense Paid	Mean Indemnity Paid
Failure to treat (n=1)	\$260,411	\$1,000,000
Improper medication regimen management (n=5)	\$78,761	\$725,000

Delay in surgery (n=9)	\$132,989	\$643,500
Diagnosis related (failure, delay, wrong) (n=29)	\$168,664	\$602,937
Improper performance of surgery (n=122)	\$78,879	\$411,514
Improper management of surgical patient (n=101)	\$93,033	\$377,382
Unnecessary surgery (n=4)	\$79,628	\$362,000

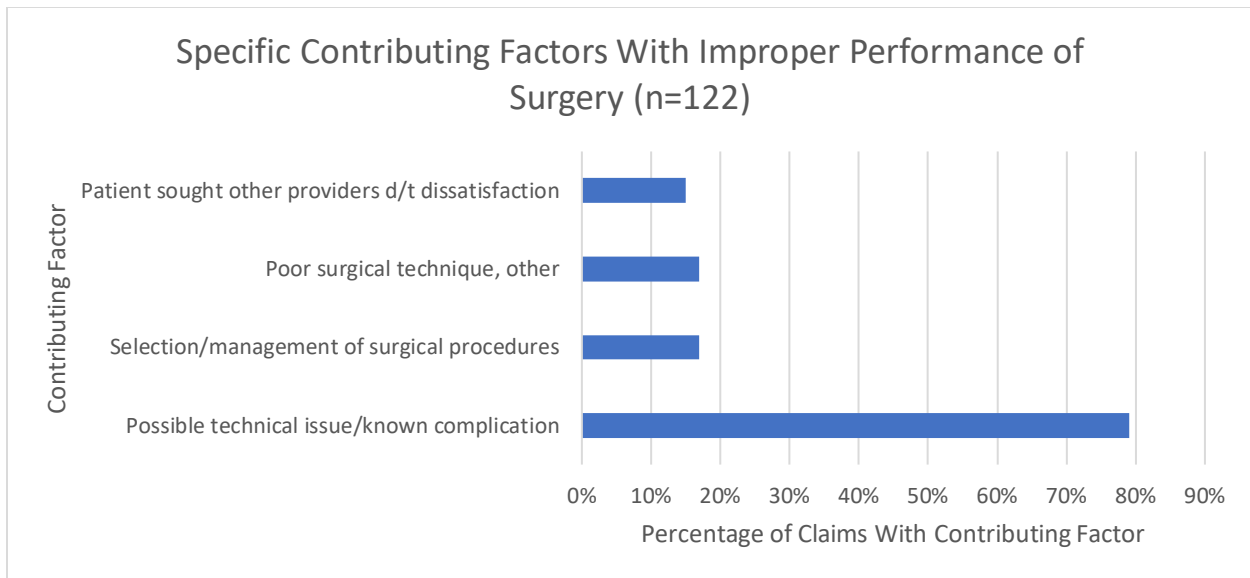
A Closer Analysis Into the Top Neurosurgery Case Types

Improper Performance of Surgery

Improper performance of surgery claims tended to follow incidents that occurred in the operating room or in ambulatory surgery centers. In this analysis, this case type proved the most common at 41 percent (n=122) of claims studied. Within the top three case types, this one contained the largest percentage of medium-severity claims, 73 percent (n=87), although high-severity claims were seen in 29 percent of these case types (n=34). Twenty-six percent of the improper performance of surgery case types (n=31) settled. The average indemnity paid in these claims was \$411,514, slightly lower than the overall indemnity average for neurosurgery cases of \$425,791.

Among procedures that were improperly performed, those involving spinal fusions were the most common, and when combined, represented 53 percent of all procedures studied. The next most common procedures were decompression of the spinal cord and excision of intervertebral discs.

As noted earlier, each case can have several contributing factors and involve various areas of concern (communication, clinical judgment, etc.), and the contributing factors can be presented in three levels from broad to detailed. Overall, technical performance issues were prominently featured in this case type, with 89 percent of the claims containing one of these factors. Technical performance far outweighed the other contributing factors, with 19 percent of the cases including patient factors, 17 percent showing selection and management of therapy, 16 percent revealing patient assessment issues, and 13 percent impacted by communication between the provider and the patient/family. This pattern continues into the detailed/specific level for contributing factors, with two technical performance-related detailed contributing factors in the majority, and known complications with a large percentage above all.



Case Example: Improper Performance of Surgery

An elderly female who had recently fallen came to the hospital for a CT due to severe back pain. The CT revealed an L2 fracture with posterior vertebral vertex fracture and a free fragment. Although the radiograph films referred to the fracture as a compression fracture, the neurosurgeon noted that it was a burst fracture. After reviewing the CT, the neurosurgeon recommended a kyphoplasty because it was a less invasive alternative to a laminectomy/fusion. The neurosurgeon documented an informed consent discussion, and the patient consented to the surgery.

The following day, a kyphoplasty was performed with fluoroscopic guidance at L2. Post-procedure, the patient complained of weakness and numbness in her left leg. A CT scan showed a cement projection in the ventral and left lateral epidural spaces with mass effect on the thecal sac and lateral recess structures. She was immediately taken back to surgery. A lumbar laminectomy and fusion were performed, along with decompression of the left L2 nerve root, removal of the cement extravasation, and repair of the pseudomeningocele. The patient was informed that she would need a pedicle fixation, but it would be done later to allow recovery of neurological functioning.

Three days later, an MRI showed a subacute compression fracture involving the superior endplate of L2 with evidence of prior cement injection. There was no evidence of distal cord cauda equina compression. After four days, the neurosurgeon performed a segmented pedicle fixation of T12–L4, and posterolateral fusions of L1–L2 and L2–L3. Two days later, the patient was transferred to a rehab facility. She has left foot drop that is not expected to improve and needs to walk with the assistance of a cane and orthotic.

Takeaways

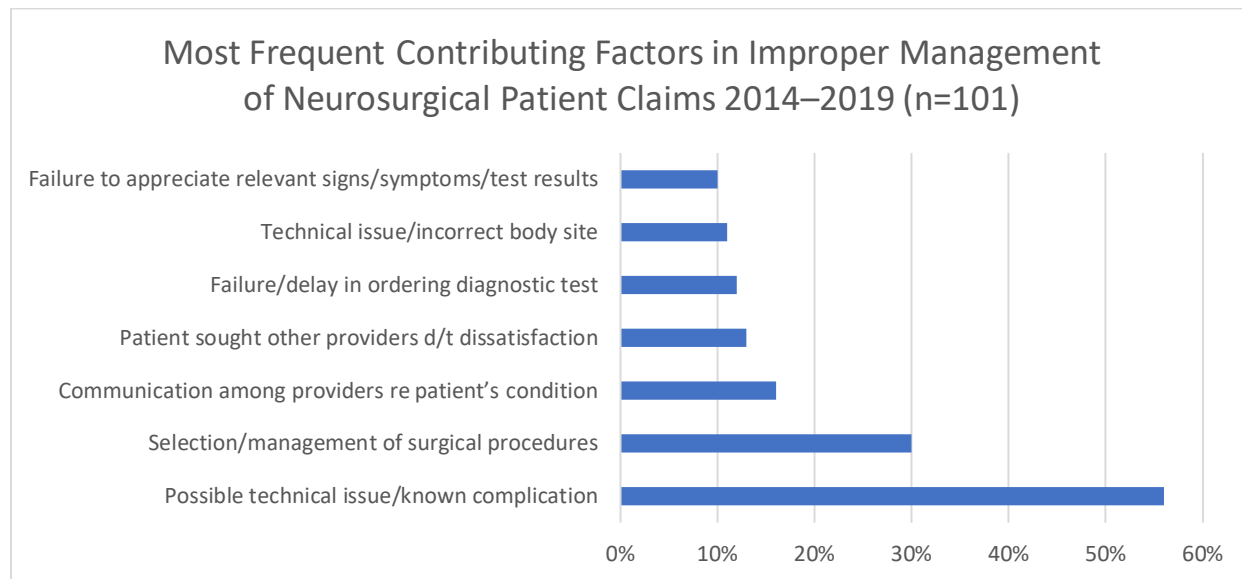
There were mixed expert reviews with this case. Some questioned the thoroughness of the informed consent discussion and whether the elderly patient understood the options and alternatives to the kyphoplasty. There were also different opinions on the selection of therapy and whether the burst fracture should have been treated surgically or conservatively.

Experts also questioned the surgeon’s technical performance and intraoperative management. Cement extravasation is a known complication of kyphoplasty; however, in reviewing the fluoroscopy images, it was apparent that the surgeon continued with the kyphoplasty procedure after seeing the cement extravasation. Even though the patient was quickly returned to surgery to remove the cement, the procedure should have been aborted at the first sighting. Several experts were critical of the failure to fuse the L4 vertebra as well.

Improper Management of the Surgical Patient

Incidents leading to allegations of improper management of the surgical patient span the entire surgical continuum, from the office consultation to the postoperative follow-up. This case type was the second most common found in this analysis (n=101). Fifty-six percent of the claims (n=55) had a medium severity, and 43 percent had a high severity (indicating some degree of disability, or death). Forty-two percent of this case type (n=42) settled, with the average indemnity being \$377,382 (overall indemnity average for neurosurgery cases was \$425,791).

Recall that claims can have multiple contributing factors, and that contributing factors have three levels of specificity. In examining the specific contributing factors, two technical skill issues emerged: known complications appeared in 56 percent of the claims (n=57), and 11 percent of claims involved an incorrect body site (the two involved sites were the cervical and lumbar spine; n=11). Three clinical judgment issues were found to be prevalent in the improper management of the surgical patient claims: 30 percent revealed issues with the selection or management of surgical/invasive procedures (n=30); 12 percent involved a failure or delay in the ordering of a diagnostic test (CTs and MRIs were the most common tests delayed or not ordered: n=12) and 10 percent contained issues relating to the failure to appreciate signs, symptoms, and test results (n=10).



Case Example: Improper Management of Surgical Patient

A middle-aged obese female with a history of complex psychosocial challenges, chronic back pain, and multiple prior surgeries, including laminectomies and a spinal fusion by different neurosurgeons, had a recent MRI showing degenerative changes at L2–L3 and L3–L4 and nerve root clumping at L4–S1, indicative of arachnoiditis. The patient had been receiving pain management services for five years and was being followed by a physical medicine and rehabilitation (PM&R) physician. She was on methadone and oxycodone for pain control and walked with a cane. The PM&R physician ordered a neurosurgical consult, an EMG, and a psychiatric referral for help with coping.

The consulted neurosurgeon agreed to see the patient, ordered additional studies, and recommended conservative treatment and follow-up with him in a few months. At the follow-up appointment, the patient reported worsening back and posterior thigh pain with numbness. She was also using a walker and had occasional urinary incontinence. A follow-up CT scan showed severe degeneration at L3–L4, and her leg pain was likely due to nerve root clumping from prior arachnoiditis. The neurosurgeon recommended an L3–4 decompression and fusion. The risks and benefits of the procedure were discussed, but there was no documented informed consent.

During the surgery, the neurosurgeon created an access window to retract the thecal sac and place the cage, but the window was not as large as the manufacturer recommended. A dural tear occurred and was repaired.

Given the patient's long-term narcotic use, postoperative pain control was difficult, which made the patient's neurological assessments challenging to obtain, so that neurological examinations were noted as "somewhat unreliable." Four days after surgery, a CT showed possible canal encroachment of L2–L3. The next day, an MRI showed fluid at L3–L4, with narrowing and compression of the thecal sac. The patient was returned to surgery for an extended laminectomy and fluid removal. There was no active leak or hematoma.

Over the next two weeks, adjusting and tapering patient-controlled analgesia (PCA) proved challenging. This limited the patient's mobility and ability to get out of bed. Her lower extremity weakness persisted, and physical therapy (PT) used transfer-assist devices to get her out of bed and into a wheelchair. PT continued to help her mobilize; however, her left leg muscle strength was 2/5 proximally and 1/5 distally. Her right leg muscle strength was 1/5 proximally and 0/5 distally. She was subsequently transferred to a skilled nursing facility. A week later, the patient's attorney requested her medical records. One month later, the neurosurgeon's office assistant called the patient regarding her overdue follow-up. The patient reported that she had found a new doctor, and the impression was that she was unsatisfied with her surgery.

Six months later, follow-up imaging studies demonstrated a partial block to the flow of contrast, which was felt to be most consistent with scarring and severe arachnoiditis. The patient now suffers from lower limb paralysis, severe pain syndrome, neurogenic bladder, and loss of bowel function secondary to cauda equina injury as a result of the first surgery.

Takeaways

Based upon expert reviews, one of the key takeaways was the importance of patient selection. There were multiple factors indicating that the patient was not a good surgical candidate, including obesity,

drug dependence, arachnoiditis, multiple prior surgeries without relief, and psychosocial factors. The minimal amount of pain relief the patient was going to receive from this surgery was not nearly enough to compensate for the risk of the known complications.

Neurosurgical procedures are inherently high risk, and significant complications may occur in the absence of negligence. That is why a substantial discussion of the risks, benefits, and alternatives was especially important, considering the patient's comorbidities and the high-risk nature of this procedure. Review of the patient's medical records revealed no documentation of the informed consent discussion, which leads one to believe that the risks and potential complications were not clearly communicated to the patient.

Experts also questioned the access window's size and location for the posterior lumbar interbody fusion (PLIF). This impeded insertion of the cage, resulting in significant retraction, which increased the risk of neurological injury. During discovery, it was also identified that the neurosurgeon had never completed a spine fellowship and was unable to support how he was trained on the hardware used in the procedure. The organization's medical staff must ensure that the credentialing process is completed, resulting in documented evidence of proper education and training on file, up to date, and immediately available.

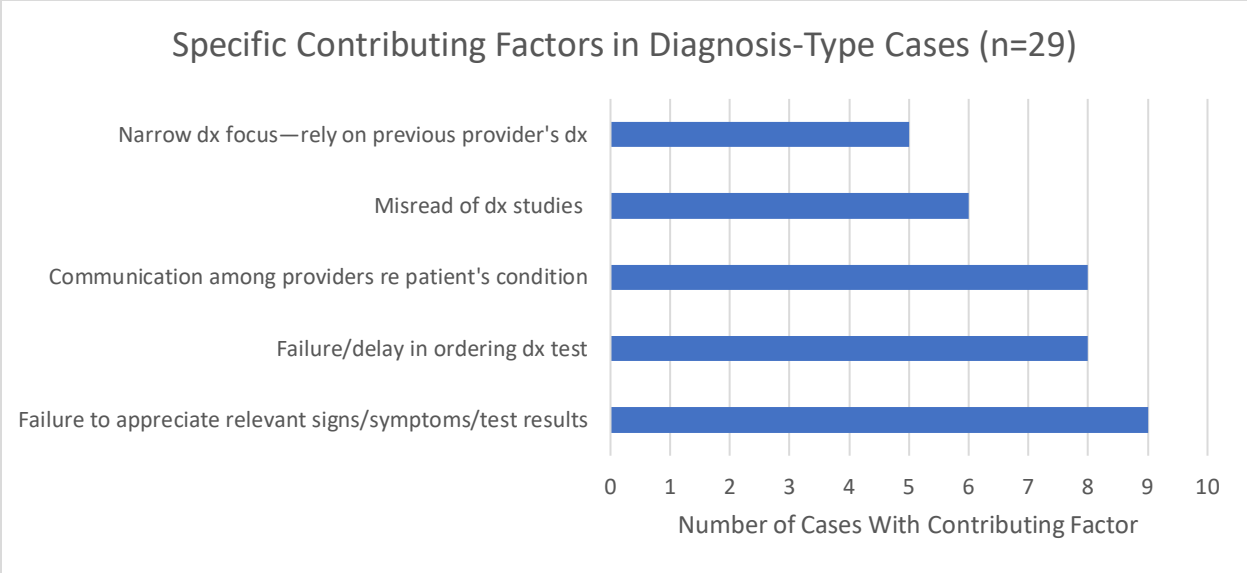
Other concerns included delayed neurological testing and imaging during the postoperative period, vague medical record documentation regarding the patient's complications, and failure to ensure timely follow-up with the patient after discharge.

Diagnosis-Related Case Types

Diagnosis-related case types can include several types: failure to diagnose, a delay in diagnosis, or a misdiagnosis. This study found that among our member neurosurgeons from 2014 to 2019, diagnosis-related claims were the third most common major case type, with 29 claims (10 percent). However, this category contained the largest percentage of high-injury claims, 79 percent (n=29). Over 34 percent of the cases (n=10) settled, with an average indemnity of \$602,937 (overall indemnity average for neurosurgery cases was \$425,791). This case type had the second highest average expenses at \$168,664 (overall expenses average for neurosurgery cases was \$146,308).

When reviewing diagnosis-related case types, the final diagnosis in the case reflects the diagnosis that was missed or should have been made. In this study, the final diagnoses indicate that the top diagnoses were related to postoperative complications 17 percent (n=5) of the time, and among postoperative complications, postoperative infection (n=3) was the most common. Of diagnoses that were either missed or delayed, intraspinal abscesses were the second most common, at 14 percent (n=4), with cauda equina (n=3) and fractures of the vertebrae (n=3) together constituting 10 percent.

As reported earlier, cases tend to have multiple contributing factors. Each factor provides insight into areas amenable to intervention and improvement. Since these were diagnosis-type cases, it was not surprising that patient assessment issues were prominent, with 69 percent (n=20) of the cases affected by these factors. Patient factors and communication among providers were also prominent, appearing in 34 percent and 31 percent of the cases, respectively. The lack of documentation was a factor in 17 percent of the cases.



When diving deeper into analysis of more specific contributing factors, factors related to clinical judgment remain prominent, including the failure to consider signs, symptoms, and test results (31 percent of diagnosis-related claims), failure or delay in ordering a diagnostic test (28 percent of claims studied), misinterpretation of a diagnostic test (21 percent of claims studied), relying on a previous provider’s diagnosis (17 percent of claims studied), and failure to obtain a consult (14 percent of claims studied). Such factors are even more impactful when coupled with issues such as patient nonadherence, which may be expressed as seeking other providers due to dissatisfaction with care (14 percent of claims studied), nonadherence with treatment regimen (10 percent of claims studied), and/or nonadherence with follow-up calls and appointments (10 percent of claims studied). Communication among providers about the patient’s condition was also an important factor, appearing in 28 percent of studied cases.

Case Example: Diagnosis Related

An elderly female came to the emergency department (ED) complaining of neck pain. She had fallen the week prior and was seen in a different ED. The patient was admitted with a working diagnosis of nerve compression or entrapment injury. An ultrasound and MRI of the neck were ordered, along with PT.

The next day, the MRI was interpreted by a radiologist as moderate spondylosis with central spinal stenosis at C2–C3 and C4–C5, multilevel foraminal stenosis, but little in the way of cord compression at C5–C6 and C6–C7. The patient continued to complain of neck pain, along with some episodic pain down her left arm with left hand numbness, so a neurosurgeon was consulted and saw the patient the next day.

The neurosurgeon assessed the patient and read the written report of the MRI, but he did not actually view the MRI. After his assessment, the neurosurgeon concluded that the patient was not a surgical candidate at this time, because he noted from the report that the C4–C5 stenosis was predominantly on the right, where there were no clinical symptoms. Since the radiological findings were discordant with the clinical findings, the neurosurgeon thought the patient should be followed as an outpatient.

Three days later, the patient’s pain was controlled, and she was discharged to a rehab facility. The physician in the rehab facility noted that the MRI showed severe spondylosis with central stenosis and

cord compression at C2–C3 and C4–C5. A few days later, the patient slipped and was found on the floor. She was moving all of her extremities and had no change in pain. The next day, the patient had a change in mental status, slurred speech, low blood pressure and heart rate, but no facial droop. She was sent to the ED. A CT scan was done that showed spinal disease with facet dislocation, jumped facets at C4-5; fracture of left anterior aspect of C5 vertebral body with anterior separation of 1 cm fracture fragment; no spinal canal narrowing/cord not visualized.

Patient was started on intravenous fluids, oxygen, and pressor support. As the patient became more alert, it was determined that she could not move her legs; her sphincter tone was weak. She was diagnosed with an acute cervical cord injury, was ventilator dependent, and died a few weeks later.

Takeaway

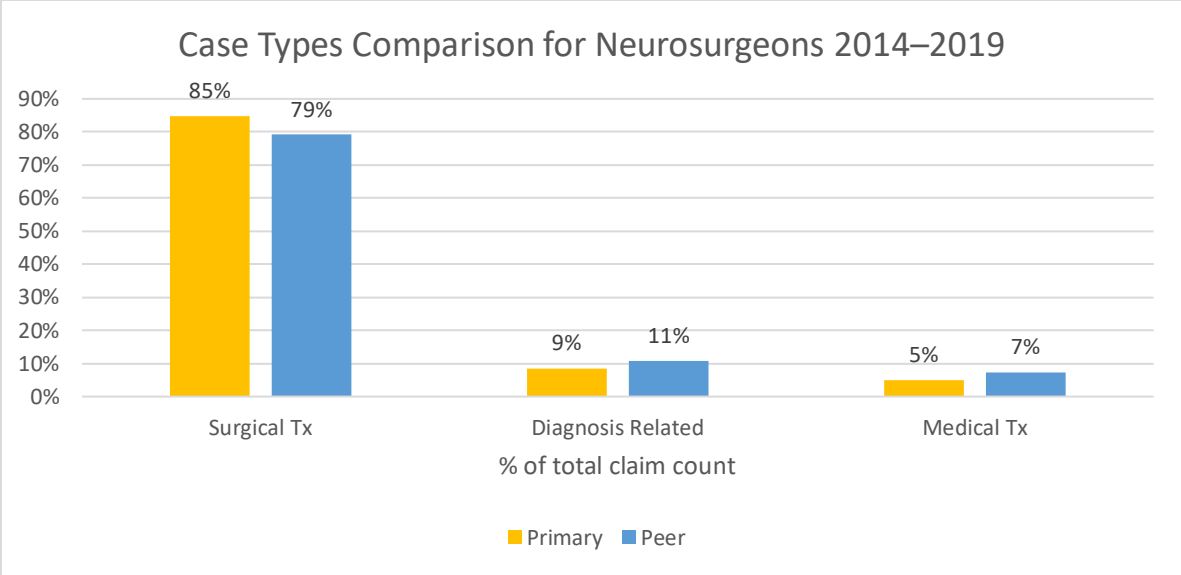
Make it a practice to review actual films. Defense experts in this case thought the neurosurgeon should have reviewed the actual films, although they were not certain that the neurosurgeon would have picked up on the subtle finding. The experts were critical of the radiologist for missing the “blood signal” on the sagittal STIR image in the posterior ligaments and disc space on the MRI. There were no fractures or major subluxation shown in the first MRI. The patient should have been placed into a firm cervical neck collar to stabilize the neck for the ligamentous injury and then had surgery. Had those steps been completed, then the outcome would have been different. It was also noted that the finding, although subtle, was abnormal enough to prompt a flexion and extension study and/or CT scan.

There were also inconsistencies between the MRI and the neurosurgeon’s exam, which echoes this study’s finding that the top contributing factor in diagnosis-type cases was the inability to reconcile signs, symptoms, and test results. In this case example, the MRI report the day prior had noted the patient had a mass and tenderness at the back of the neck. However, this finding is not found in the documentation of the neurosurgeon’s exam; therefore, it is unclear whether the patient had had a stable neck at that point.

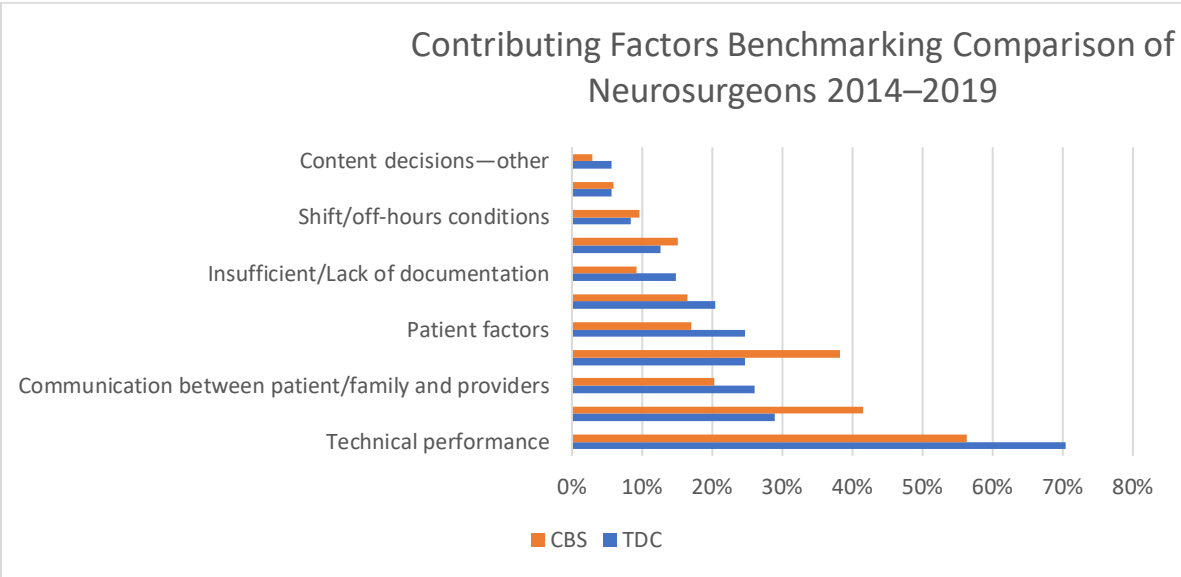
Benchmarking

With over 20 other national organizations, The Doctors Company contributes to a database of malpractice information: the Comparative Benchmarking System (CBS). The other organizations include not only fellow medical professional liability insurers, but also academic medical centers, healthcare networks, and community-based hospitals. The overarching goal is to reduce medical error, as well as malpractice exposure. This system provides the ability to compare the performance of one group to that of the CBS overall.

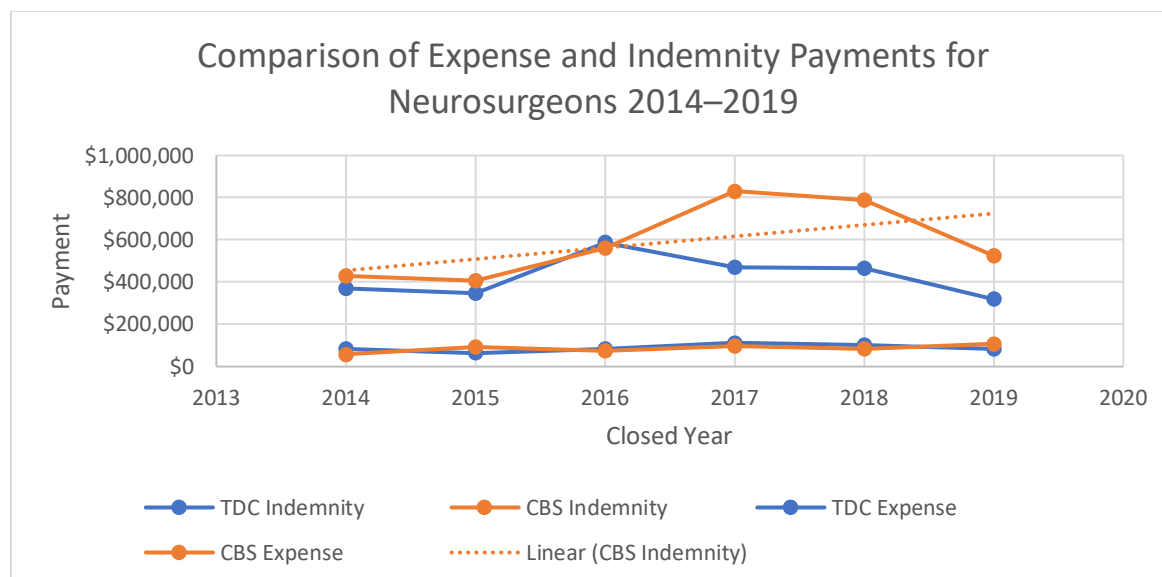
In this case, severity levels seen in claims against neurosurgeon members of The Doctors Company were similar to those seen in claims against the peer CBS group. Members of The Doctors Company had slightly more surgical treatment–related case types, and the CBS peer group had slightly more diagnosis-related and medical treatment–related case types. However, the overwhelming case type for both groups was surgical treatment–related (85 percent for The Doctors Company, 79 percent for CBS).



Regarding contributing factors, there were some notable differences in the groups. Studied claims against members of The Doctors Company showed that they experienced 14 percent more technical issues and 8 percent more patient factors in their claims than did the CBS peer group, whereas claims against the CBS peer group showed 12 percent more patient assessment issues and 13 percent more selection and management of therapy issues, when compared to The Doctors Company peer group.



Among expenses, no major differences were shown. However, the CBS peer group paid higher indemnities over the years, revealing a trend of indemnities increasing.



Risk Mitigation Strategies

- Patient selection is critical. Many claims originate with patients who are not appropriate candidates for procedures. Having a well-planned and carefully executed patient selection process can help identify patients who are good surgical candidates and those who may not be able to achieve satisfactory results.
- Help patients set reasonable expectations about outcomes by discussing the possibility of less-than-optimal results, as well as complications that could delay recovery and affect lifestyle. In this study, the most common case type (49 percent) was improper performance of surgery. Although patients assumed that surgeon negligence was the cause of the undesirable outcome, physician reviewers found that only 6 percent of the claims involved substandard care. In neurosurgery, more than in any other physician specialty, the patient's expectations prior to a procedure determined whether the patient considered the outcome to be a success.
- Maintain patient trust with good communication. Most of the complications that commonly occur in spinal and other neurological surgeries are reviewed during informed consent discussions. Good follow-up and early diagnosis of complications are key but can be complicated when patients do not adhere to instructions or fail to attend follow-up appointments. When an undesirable outcome occurs, help patients link the complication with the informed consent discussion, and remind them of your conversations regarding risks.
- Use a combination of modalities during the [informed consent discussion](#). Consider a procedure-specific consent form that lists important points for neurosurgeons to check off upon discussion, written materials, interactive websites, and illustrations to improve patient knowledge and understanding of the risks involved. The use of shared decision making can enhance this discussion (See the Agency for Healthcare Research and Quality's (AHRQ's) resources on [Shared Decision Making](#)).
- Build rapport with patients. As with most physician specialties, the neurosurgeon's relationship with the patient plays an important role in the patient's experience and outcome. We see the effect of poor relationships when patients complain of unsympathetic responses, seek other

- providers due to dissatisfaction with care, fail to follow discharge or follow-up instructions, and/or file claims for injuries that were explained as risks of the procedure.
- Implement educational tools that can help you explain the patient’s diagnosis and plan for care. The Institute for Healthcare Improvement (IHI) has developed [Ask Me 3](#), a patient education program that provides a platform to improve communication between patients, families, and healthcare professionals. At the conclusion of an office visit, the physician offers the form to the patient, who then asks three questions. By writing the physician’s responses on the form, the patient enhances understanding and reinforces recall of the information provided by the physician.
 - [Educate nursing staff members](#) to help them identify problems in patients with neurological conditions and procedures. Assessments by neurology-trained staff can promote early recognition of surgical complications and other undesirable outcomes of treatment—and early intervention is essential for improving a patient’s chances of a good outcome. Many procedures that have inherent risks for undesirable outcomes see the odds for success improved when complications are diagnosed early.

Limitations

This study is not representative of all neurosurgeons and their practices. This study relied on closed medical malpractice claims from one large national malpractice carrier, and it does not account for other malpractice claims in the United States. This study did not investigate differences between settings, such as academic medical hospital vs. community hospital, nor did it measure the complexity of surgeries being conducted by individual surgeons. Additionally, not all injured patients seek legal action, and those patients’ experiences are not captured in this study.

Conclusion

This study provides insight into both neurosurgical risks and how to improve practice to mitigate them. Factors around clinical judgment and communication warrant more attention. The CBS comparison illustrated mostly similarities between the claims experience of neurosurgeon members of The Doctors Company and their peers around the nation, with a few differences. Additionally, patient factors related to nonadherence may have components of health literacy or health disparities that could require more scrutiny. Our overarching goal is to integrate evidence-based recommendations into clinical practice.

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