

Rates and Characteristics of Paid Malpractice Claims Among US Physicians by Specialty, 1992-2014

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IMPORTANCE Although physician concerns about medical malpractice are substantial, national data are lacking on the rate of claims paid on behalf of US physicians by specialty.

OBJECTIVE To characterize paid malpractice claims by specialty.

DESIGN, SETTING, AND PARTICIPANTS A comprehensive analysis was conducted of all paid malpractice claims, with linkage to physician specialty, from the National Practitioner Data Bank from January 1, 1992, to December 31, 2014, a period including an estimated 19.9 million physician-years. All dollar amounts were inflation adjusted to 2014 dollars using the Consumer Price Index. The dates on which this analysis was performed were from May 1, 2015, to February 20, 2016, and from October 25 to December 16, 2016.

MAIN OUTCOMES AND MEASURES For malpractice claims (n = 280 368) paid on behalf of physicians (in aggregate and by specialty): rates per physician-year, mean compensation amounts, the concentration of paid claims among a limited number of physicians, the proportion of paid claims that were greater than \$1 million, severity of injury, and type of malpractice alleged.

RESULTS From 1992-1996 to 2009-2014, the rate of paid claims decreased by 55.7% (from 20.1 to 8.9 per 1000 physician-years; $P < .001$), ranging from a 13.5% decrease in cardiology (from 15.6 to 13.5 per 1000 physician-years; $P = .15$) to a 75.8% decrease in pediatrics (from 9.9 to 2.4 per 1000 physician-years; $P < .001$). The mean compensation payment was \$329 565. The mean payment increased by 23.3%, from \$286 751 in 1992-1996 to \$353 473 in 2009-2014 ($P < .001$). The increases ranged from \$17 431 in general practice (from \$218 350 in 1992-1996 to \$235 781 in 2009-2014; $P = .36$) to \$114 410 in gastroenterology (from \$276 128 in 1992-1996 to \$390 538 in 2009-2014; $P < .001$) and \$138 708 in pathology (from \$335 249 in 1992-1996 to \$473 957 in 2009-2014; $P = .005$). Of 280 368 paid claims, 21 271 (7.6%) exceeded \$1 million (4304 of 69 617 [6.2%] in 1992-1996 and 4322 of 54 081 [8.0%] in 2009-2014), and 32.1% (35 293 of 109 865) involved a patient death. Diagnostic error was the most common type of allegation, present in 31.8% (35 349 of 111 066) of paid claims, ranging from 3.5% in anesthesiology (153 of 4317) to 87.0% in pathology (915 of 1052).

CONCLUSIONS AND RELEVANCE Between 1992 and 2014, the rate of malpractice claims paid on behalf of physicians in the United States declined substantially. Mean compensation amounts and the percentage of paid claims exceeding \$1 million increased, with wide differences in rates and characteristics across specialties. A better understanding of the causes of variation among specialties in paid malpractice claims may help reduce both patient injury and physicians' risk of liability.

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In 1986, Congress created the National Practitioner Data Bank (NPDB) to serve as a centralized database of malpractice claims paid on behalf of US physicians.¹ Since its inception, the NPDB has contributed to our understanding of national trends in medical malpractice payments and characteristics of risk of liability for physicians. The lack of information on physician specialties, however, has been a major limitation of analyses relying on information in the NPDB.

Physicians' perceptions of their risk of liability influence clinical decision making.^{2,3} A nationally representative analysis of paid medical malpractice claims by specialty could enable physicians to better understand their specific risk of malpractice claims and shed light on areas where liability and patient safety risks are the greatest. Previous efforts to provide specialty-level information on risk of liability have used data from a single malpractice carrier,^{4,5} limited geographic areas,⁶ or a single specialty.^{7,8} However, to our knowledge, to date there has not been an analysis of malpractice trends by specialty using nationally comprehensive data.

We newly linked all malpractice claims in the NPDB paid on behalf of US physicians from 1992 to 2014 with physician specialty and evaluated how liability characteristics vary by specialty. We evaluated the following at the aggregate level and specialty level: the annual rate of paid malpractice claims per physician and changes in the rate over time, mean dollar amount of paid claims, concentration of paid claims among a limited number of physicians, frequency of catastrophic payments (ie, those exceeding \$1 million),⁹ severity of patient injury, and category of malpractice alleged.

Methods

Data Sources

The Division of Practitioner Data Banks, which is part of the Health Resources and Services Administration, linked each malpractice claim paid on behalf of a physician in the NPDB with the physician's specialty, which was obtained from the American Medical Association Physician Masterfile (AMA Masterfile). Paid malpractice claims were successfully matched with physician specialty in 98% of cases. For physicians practicing in more than 1 specialty, we used the AMA's definition of *primary specialty*, which is the specialty in which the physicians practiced the majority of their time.¹⁰ We grouped physicians into 24 specialty categories based on the AMA Masterfile classification scheme; these 24 classifications accounted for 91% of all paid malpractice claims during the study period. An "other" category captured the remaining physicians.¹¹ The Partners HealthCare Institutional Review Board concluded that the study did not constitute human participants research and therefore approval was not needed.

Data Elements

The NPDB defines a paid claim as any payment made on behalf of an individual physician in response to a written request for compensation as part of a medical malpractice claim. This payment may be the result of a court decision or a negotiated settlement (whether or not a lawsuit was filed). Each

Key Points

Questions What are the trends in paid medical malpractice claims for physicians in the United States, and do they vary by specialty?

Findings This database study linked National Practitioner Data Bank claims data with physician specialty and found that the overall rate of claims paid on behalf of physicians deceased by 55.7% from 1992 to 2014. Mean compensation amounts and the percentage of payments exceeding \$1 million increased during that time, with wide differences in rates and characteristics across specialties.

Meaning A better understanding of the causes of variation among specialties in paid malpractice claims may help reduce patient injury and physicians' risk of liability.

instance of a paid claim in the NPDB included the year the claim was paid, payment amount, severity of injury, type of error alleged, and an encrypted physician identifier. Severity of injury, ranging from emotional injury to death, was categorized based on the National Association of Insurance Commissioners' (NAIC) Severity of Injury Scale, which is commonly used in tort cases.¹² The types of errors alleged spanned 11 categories: diagnosis related, medication related, treatment related, surgery related, anesthesia related, intravenous and blood products related, obstetrics related, monitoring related, equipment or product related, behavioral health related, and other miscellaneous. For this analysis, the latter 7 categories were grouped together in an "other" category.

Statistical Analysis

To calculate the rate of paid claims per physician-year, the number of physicians for whom a malpractice claim was paid in a given year formed the numerator, and the number of physicians in each specialty from the AMA Masterfile data in each year from January 1, 1992, to December 31, 2013, formed the denominator. Data on the number of physicians in each specialty for 2014 were unavailable and were imputed based on a specialty's average rate of growth from 2010 to 2013.

To smooth annual fluctuations, we calculated the rate of paid malpractice claims per 1000 physician-years in each specialty in 4 time intervals: 1992-1996, 1997-2002, 2003-2008, and 2009-2014. We computed mean changes over time by comparing the most recent time period (2009-2014) with the earliest time period (1992-1996). We used *t* tests to determine statistical significance. $P < .05$ (2-sided) was considered statistically significant. We defined *catastrophic payments* as those greater than \$1 million because that amount is a common per-incident limit of malpractice insurance policies, and prior research has suggested that malpractice payments cluster at or just below the limits of liability insurance.^{9,13} To account for inflation, we adjusted all dollar amounts to 2014 dollars using the Consumer Price Index.

To evaluate the concentration of paid malpractice claims among physicians in each specialty (ie, to assess whether a few physicians accounted for a disproportionate share of paid claims), we summed the number of paid claims that each physician had from 1992 to 2014. Within each specialty, we then

Table 1. Number of Paid Medical Malpractice Claims and Concentration of Paid Claims in the National Practitioner Databank by Specialty, 1992-2014

Specialty	Physicians With at Least 1 Paid Claim, No.	Total Paid Claims, No.	Paid Claims per 1000 Physician-years	All Paid Claims Among Top 1% of Physicians With Highest No. of Paid Claims, No. (%)	Paid Claims per Physician Among Top 1% of Physicians With Highest No. of Paid Claims, Mean No.
All specialties	175 667	280 368	14.1	21 308 (7.6)	1.69
Anesthesiology	7892	10 246	11.7	740 (7.2)	1.59
Cardiology	5378	7759	15.9	610 (7.9)	1.20
Colon and rectal surgery	549	985	34.1	75 (7.6)	1.17
Dermatology	1717	2712	11.6	390 (14.4)	2.82
Emergency medicine	8007	11 574	18.8	506 (4.4)	1.31
Family Medicine	18 349	24 962	14.3	2048 (8.2)	1.40
Gastroenterology	2881	4162	15.8	248 (6.0)	1.16
General practice	4435	6478	21.9	451 (7.0)	2.07
General surgery	12 981	26 423	30.0	1767 (6.7)	1.55
Internal medicine	17 174	23 401	7.1	2042 (8.7)	1.55
Neurology	2156	2986	9.5	245 (8.2)	2.04
Neurosurgery	2797	6468	53.1	479 (7.4)	2.14
Obstetrics and gynecology	20 060	39 897	42.5	2661 (6.7)	1.74
Ophthalmology	4044	6470	15.5	659 (10.2)	2.43
Orthopedics	10 641	22 231	40.9	1517 (6.8)	1.45
Otolaryngology	3226	5434	24.4	443 (8.2)	1.24
Pathology	2372	2920	6.9	123 (4.2)	1.81
Pediatrics	5799	7516	4.9	632 (8.4)	3.01
Plastic surgery	3156	7352	48.5	768 (10.4)	3.51
Psychiatry	3115	3948	4.3	335 (8.5)	2.46
Pulmonology	1746	2273	10.5	162 (7.1)	1.37
Radiology	9079	13 760	18.9	1075 (7.8)	1.21
Thoracic surgery	2179	3925	46.7	310 (7.9)	1.58
Urology	3631	6107	25.6	663 (10.9)	1.57
Other	22 303	30 379	7.1	2359 (7.8)	1.94

identified physicians in the top 1% by number of paid claims. We chose to analyze the top 1% of physicians with the greatest number of paid claims based on prior research demonstrating that this group accrues an especially large proportion of all paid claims.¹⁴

We categorized severity of injury into 4 groups: emotional injury only or minor physical injury (NAIC scale, 1-3), significant physical injury (NAIC scale, 4-6), major physical injury (NAIC scale, 7-8), or death (NAIC scale, 9).^{15,16} We categorized types of alleged errors as diagnosis, surgery, medication or treatment, or other.¹⁷

Results

From 1992 to 2014, a total of 280 368 malpractice claims (for 175 667 physicians) were reported to the NPDB as paid on behalf of physicians (Table 1). Across the estimated 19.9 million physician-years in the study, the annual overall rate of paid malpractice claims was 14.1 per 1000 physician-years.

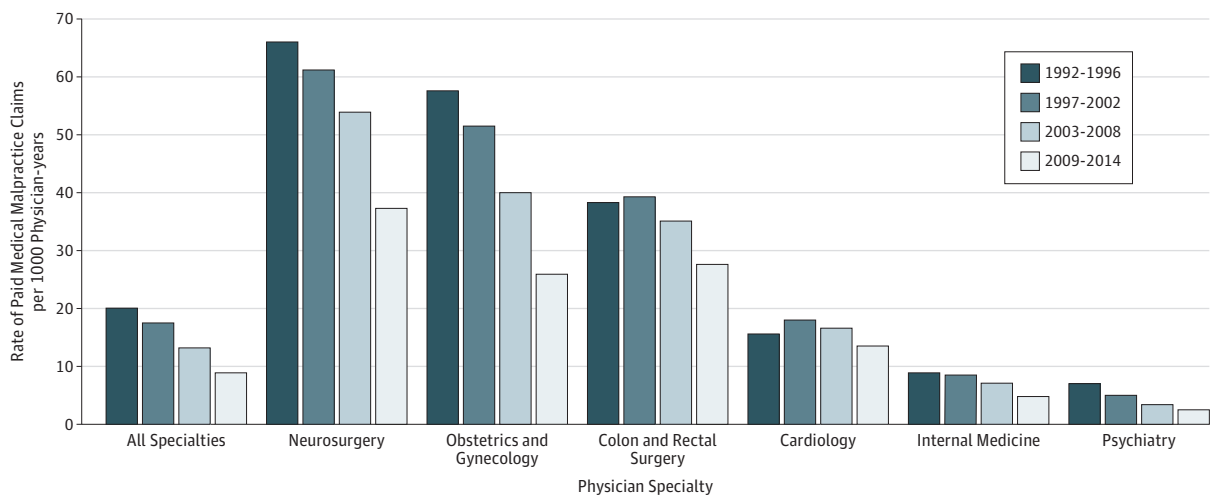
The rate of paid malpractice claims for all physicians declined by 55.7%, from 20.1 per 1000 physician-years during

1992-1996, to 8.9 per 1000 physician-years during 2009-2014 ($P < .001$) (Figure and Table 2). The decrease occurred across all specialties, although the magnitude of the decline varied markedly by specialty, and was significant in each specialty except cardiology. Pediatrics had the largest decline in paid malpractice claims, at 75.8% (from 9.9 to 2.4 per 1000 physician-years; $P < .001$), and cardiology had the smallest, at 13.5% (from 15.6 to 13.5 per 1000 physician-years; $P = .15$).

Among all paid claims, the mean payment was \$329 565 (Table 3). Neurosurgery had the largest mean payment (\$469 222) and dermatology had the smallest (\$189 065). From 1992-1996 to 2009-2014, the mean payment, adjusted to 2014 dollars, increased by 23.3%, from \$286 751 to \$353 473 ($P < .001$). The increase in the mean payment varied by specialty and was significant for 16 of the 24 specialties. The increases ranged from \$17 431 in general practice (from \$218 350 in 1992-1996 to \$235 781 in 2009-2014; $P = .36$) to \$138 708 in pathology (from \$335 249 in 1992-1996 to \$473 957 in 2009-2014; $P = .005$) and \$114 410 in gastroenterology (from \$276 128 in 1992-1996 to \$390 538 in 2009-2014; $P < .001$).

Paid claims were unevenly distributed across physicians (Table 1). The 1% of physicians with the highest number of paid

Figure. Rates of Paid Medical Malpractice Claims in Selected Specialties From 1992 to 2014



The rate of paid malpractice claims ($n = 280\,368$) for all physicians declined by 55.7%, from 20.1 per 1000 physician-years during 1992-1996, to 8.9 per 1000 physician-years during 2009-2014.

claims had 7.6% of all paid claims (21 308 of 280 368 claims; mean of 1.69 paid claims per physician). The 5% and 10% of all physicians with the highest number of paid claims had 23.3% (65 194 of 280 368) and 39.4% (110 583 of 280 368), respectively, of all paid claims. Within dermatology, the top 1% of physicians had 14.4% of all paid claims (390 of 2712 claims; mean of 2.82 paid claims per physician). Within urology, plastic surgery, and ophthalmology, the top 1% of physicians incurred more than 10% of all paid claims. Pathology and emergency medicine had the lowest concentrations of paid claims, with the top 1% of physicians incurring less than 5% of all paid claims.

Paid malpractice claims exceeding \$1 million (ie, catastrophic claims)⁹ comprised 7.6% (21 271 of 280 368) of paid claims, and accounted for 6.2% (4304 of 69 617) of paid claims in 1992-1996 and 8.0% (4322 of 54 081) in 2009-2014 (eTable in the Supplement). The percentage of catastrophic claims increased over time in 23 of the 24 specialties, and the increase was significant in 13 specialties. Neurosurgery had the highest percentage of catastrophic payments (13.0% [838 of 6468]), followed by obstetrics and gynecology (12.4% [4946 of 39 897]) and neurology (11.8% [353 of 2986]); pediatrics, pathology, and anesthesiology were also above 10%. Plastic surgery had the lowest percentage of catastrophic payments (2.7% [198 of 7352]).

Severity of patient injury varied considerably across specialties (Table 4). Of paid claims, 32.1% (35 293 of 109 865) involved patient death, ranging from 2.7% (68 of 2481) for ophthalmologists to 64.8% (636 of 981) for pulmonologists. The lowest severity of injury category, minor physical or emotional injury, accounted for 13.6% (14 901 of 109 865) of paid claims. Plastic surgery and dermatology had the highest percentages of paid claims falling into this lowest severity of injury category (35.6% [907 of 2549] and 32.4% [298 of 919], respectively); pulmonology had the lowest percentage (3.0% [29 of 981]).

Across all paid claims, the most common type of allegation was an error in diagnosis (31.8% [35 349 of 111 066]), followed by errors related to surgery (26.9% [29 861 of 111 066]), and errors related to medication or treatment (24.5% [27 153 of 111 066]). There were marked differences among specialties in the proportion of paid claims attributable to diagnostic errors. The percentage of paid claims in which diagnostic errors were alleged was highest in pathology (87.0% [915 of 1052]) and radiology (83.9% [4972 of 5923]), and lowest in anesthesiology (3.5% [153 of 4317]) and plastic surgery (4.3% [111 of 2569]). Plastic surgery had the highest percentage of paid claims related to alleged surgical errors (73.3% [1882 of 2569]). The specialties with the highest percentage of paid claims related to alleged errors in medication or treatment were psychiatry (55.8% [737 of 1320]) and dermatology (45.1% [419 of 929]) followed by general practice (41.4% [582 of 1405]), cardiology (40.0% [1449 of 3622]), and pulmonology (39.6% [390 of 986]). Anesthesiology and obstetrics and gynecology were the only specialties with most paid claims in the other category (66.5% [2872 of 4317] and 53.4% [7854 of 14 715], respectively), which reflected the inclusion in the other category of anesthesia-related claims (60.5% of overall claims in anesthesia) and obstetrics-related claims (50.5% of overall claims in obstetrics and gynecology).

Discussion

By linking NPDB claims data with physician specialty, we found that the rate of claims paid on behalf of all physicians declined by 55.7% from 1992 to 2014, with considerable variation by specialty. Pediatricians had the largest decline (75.8%); cardiologists had the smallest (13.5%).

Prior analyses have demonstrated a similar downward trend in the rate of paid malpractice claims. One report using NPDB data found an average annual decrease of 6.3% in the

Table 2. Annual Rates of Paid Medical Malpractice Claims per 1000 Physician-years

Specialty	Rate of Paid Medical Malpractice Claims					Difference in Mean Rate From Period 1 to Period 4	Percentage Change ^a
	1992-2014 (All Periods)	1992-1996 (Period 1)	1997-2002 (Period 2)	2003-2008 (Period 3)	2009-2014 (Period 4)		
All specialties	14.1	20.1	17.5	13.2	8.9	-11.2	-55.7
Anesthesiology	11.7	15.4	13.7	10.8	8.6	-6.8	-44.2
Cardiology	15.9	15.6	18.0	16.6	13.5	-2.1	-13.5
Colon and rectal surgery	34.1	38.3	39.3	35.1	27.6	-10.7	-27.9
Dermatology	11.6	17.3	15.2	10.6	6.2	-11.1	-64.2
Emergency medicine	18.8	24.3	24.4	18.6	13.0	-11.3	-46.5
Family medicine	14.3	22.3	18.4	13.0	8.2	-14.1	-63.2
Gastroenterology	15.8	18.5	18.0	16.5	12.1	-6.4	-34.6
General practice	21.9	29.0	23.2	16.7	12.6	-16.4	-56.6
General surgery	30.0	34.4	34.3	29.9	22.2	-12.2	-35.5
Internal medicine	7.1	8.9	8.5	7.1	4.8	-4.1	-46.1
Neurology	9.5	13.1	12.0	9.4	5.8	-7.3	-55.7
Neurosurgery	53.1	66.0	61.2	53.9	37.3	-28.7	-43.5
Obstetrics and gynecology	42.5	57.6	51.5	40.0	25.9	-31.7	-55.0
Ophthalmology	15.5	18.9	18.1	15.7	10.2	-8.7	-46.0
Orthopedics	40.9	56.5	51.1	36.7	25.0	-31.5	-55.8
Otolaryngology	24.4	33.0	29.3	21.9	16.4	-16.6	-50.3
Pathology	6.9	9.1	8.4	6.1	4.5	-4.6	-50.5
Pediatrics	4.9	9.9	5.9	4.0	2.4	-7.5	-75.8
Plastic surgery	48.5	64.8	71.3	43.1	26.0	-38.8	-59.9
Psychiatry	4.3	7.0	5.0	3.4	2.5	-4.5	-64.3
Pulmonology	10.5	14.0	13.5	10.0	7.2	-6.8	-48.6
Radiology	18.9	22.3	22.7	18.7	13.7	-8.6	-38.6
Thoracic surgery	46.7	90.6	72.5	37.2	24.0	-66.6	-73.5
Urology	25.6	30.3	32.3	23.7	17.8	-12.5	-41.3
Other	7.1	11.3	8.6	6.7	4.6	-6.7	-59.3

^a The percentage change was statistically significant for all specialties except cardiology ($P = .15$ for cardiology; $P = .001$ for colon and rectal surgery, and $P < .001$ for all other specialties).

rate of paid malpractice claims from 1994 to 2013,¹⁸ and another found that decreases in paid claims occurred faster in the inpatient than the outpatient setting.¹⁷ Neither study, however, evaluated paid claims by physician specialty at the national level.

Several factors may help to explain why the rate of claims paid on behalf of physicians is declining. First, the passage of traditional tort reforms during this period—such as damage caps and statutes of limitation—is a possible explanation.^{18,19} Analyses, however, have not found a consistent association between traditional tort reforms and decreases in the rates of paid claims.²⁰⁻²³ Second, improvements in patient safety would be an encouraging explanation, although our findings cannot establish this fact. Certain measures, such as the use of checklists^{24,25} and patient handoff protocols,²⁶ have been shown to enhance patient safety. Recent studies, however, have found that patient safety is still lacking in the US health care system.^{27,28}

Third, the manner by which institutions and insurers resolve claims may be an explanation. Federal law¹ only requires that all written claims paid on behalf of physicians be reported to the NPDB. A growing number of claims may be settled on behalf of institutions alone, instead of indi-

vidual physicians, thereby not triggering the NPDB reporting requirements.^{21,29,30} Critics have referred to this practice as corporate shielding, and expressed the concern that it blunts the ability to detect and track physicians with an excessive number of negligent events.^{29,31} The extent of corporate shielding is not known, including whether hospitals that employ their physicians are more likely to shield them than are other hospitals. It is also possible that an institution's decision to assume liability was driven by a good-faith conclusion that the event giving rise to the paid claim was the result of a systems problem, rather than the negligence of an individual physician.

The fourth factor is the growing prevalence of communication and resolution (sometimes referred to as disclosure, apology, and offer) programs, through which compensation for an injury due to negligence may be provided without requiring a written claim from a patient.^{18,32} As adoption of these programs increases, their effect will likely grow over time.

Consistent with recent research,¹⁴ we also found that a small group of physicians in each specialty incur a disproportionately large share of paid claims, with variation across specialties. Although the specific reasons that these physicians incur such a large share of claims are not known, potential

Table 3. Medical Malpractice Payment Amounts for 280 368 Paid Claims^a

Specialty	Mean Malpractice Payment, \$					Difference in Mean From Period 1 to Period 4, \$ (%)	P Value for Difference (Period 1 vs Period 4)
	1992-2014 (All Periods)	1992-1996 (Period 1)	1997-2002 (Period 2)	2003-2008 (Period 3)	2009-2014 (Period 4)		
All specialties	329 565	286 751	323 263	360 260	353 473	66 722 (23.3)	<.001
Anesthesiology	377 499	313 201	392 702	439 839	354 038	40 837 (13.0)	.02
Cardiology	365 029	337 605	367 949	376 668	368 350	30 745 (9.1)	.21
Colon and rectal surgery	337 976	283 112	357 682	348 264	345 438	62 326 (22.0)	.12
Dermatology	189 065	161 512	187 426	194 672	228 966	67 454 (41.8)	.007
Emergency medicine	309 411	249 107	313 948	340 495	314 052	64 945 (26.1)	<.001
Family medicine	290 698	237 669	293 272	319 030	319 382	81 713 (34.4)	<.001
Gastroenterology	349 013	276 128	338 441	374 369	390 538	114 410 (41.4)	<.001
General practice	231 622	218 350	239 537	246 261	235 781	17 431 (8.0)	.36
General surgery	298 625	266 715	282 220	325 521	329 437	62 722 (23.5)	<.001
Internal medicine	318 071	280 725	313 128	340 505	333 540	52 815 (18.8)	<.001
Neurology	431 049	405 348	419 079	445 823	459 857	54 509 (13.4)	.19
Neurosurgery	469 222	445 182	457 919	488 756	487 043	41 861 (9.4)	.14
Obstetrics and gynecology	432 959	387 186	421 171	485 590	447 034	59 848 (15.5)	<.001
Ophthalmology	244 039	208 766	239 441	256 043	283 275	74 509 (35.7)	<.001
Orthopedics	258 763	227 154	255 000	281 487	283 979	56 825 (25.0)	<.001
Otolaryngology	282 822	239 823	282 124	313 848	304 347	64 524 (26.9)	<.001
Pathology	411 529	335 249	427 356	432 229	473 957	138 708 (41.4)	.005
Pediatrics	413 974	370 817	445 167	434 960	413 324	42 507 (11.5)	.25
Plastic surgery	189 219	169 614	171 337	219 955	210 062	40 448 (23.8)	.05
Psychiatry	238 909	234 220	215 446	257 020	269 870	35 650 (15.2)	.001
Pulmonology	348 066	328 593	345 025	354 323	363 177	34 584 (10.5)	<.001
Radiology	333 422	268 429	335 087	357 770	366 009	97 580 (36.4)	.26
Thoracic surgery	380 402	322 493	381 230	407 339	423 929	101 436 (31.5)	<.001
Urology	273 290	234 757	234 503	318 484	330 114	95 357 (40.6)	.001
Other	331 709	281 417	324 508	354 585	367 363	85 946 (30.5)	<.001

^a All payment amounts were adjusted to 2014 dollars based on the Consumer Price Index.

explanations include that they care for higher-risk patients, practice in higher-liability risk environments, or repeatedly provide substandard care (sometimes referred to as the bad apples hypothesis⁶). National Practitioner Data Bank data alone cannot definitively distinguish among these possibilities, which would require detailed case-level assessment of the care provided, as well as risk adjustment.

Even though the number of paid claims declined during the study period, the mean payment increased by 23.3% (adjusted for 2014 dollars) and varied by specialty. The reasons are unclear, but may be related to plaintiffs' attorneys increasingly not taking cases with smaller potential payments because of either the risk of loss or the administrative costs of bringing such a claim.^{15,33} One effect of some medical liability reforms, such as pretrial screening panels, is to increase the administrative burden and costs of bringing a claim,^{18,19} which could reinforce the selection pressure on plaintiffs' attorneys to avoid taking claims with smaller expected payments. Smaller claims may also be settled earlier, and outside of the written claims process, thereby leaving only the larger claims in the database.

The percentage of paid claims exceeding \$1 million significantly increased in 13 of the 24 specialties, with an overall

absolute percentage increase of 1.8%. Very large awards are relatively infrequent and are often the result of payment for the anticipated ongoing care of a patient with severe injuries rather than compensation for an egregious and negligent act. For example, neurosurgery had the highest percentage of catastrophic claims, which may reflect the debilitating nature of the injuries that can result from neurologic surgery rather than the degree of negligence. Even though very large awards are relatively infrequent, the prospect of facing a large award can be stressful for physicians, especially if they fear a personal financial toll.^{13,34} Although physicians infrequently pay a malpractice award out of pocket, our analysis suggests the need for further study of trends in large payments.³⁵ Caps on non-economic (pain and suffering) damage do not bar large awards to fully compensate patients for their actual economic losses.³⁶

Although the most common type of allegation in the paid claims was an error in diagnosis, it was the most common type of malpractice alleged in only 9 of 24 specialties, most notably in pathology and radiology, likely reflecting the focus of these specialties on the diagnostic process. The finding that certain specialties had higher percentages of paid claims related to alleged diagnostic error adds to the 2015 National Academy of Medicine report *Improving Diagnosis in Health Care*,

Table 4. Characteristics of Paid Medical Malpractice Claims From 2004 to 2014^a

Specialty	Claims, No. (%)							
	Severity of Injury (n = 109 865) ^b				Category of Malpractice Alleged (n = 111 066)			
	Minor Physical or Emotional	Significant Physical	Major Physical	Death	Diagnosis	Surgery	Medication or Treatment	Other
All specialties	14 901 (13.6)	42 697 (38.9)	16 974 (15.4)	35 293 (32.1)	35 349 (31.8)	29 861 (26.9)	27 153 (24.5)	18 703 (16.8)
Anesthesiology	770/4288 (18.0)	1290/4288 (30.1)	774/4288 (18.1)	1454/4288 (33.9)	153/4317 (3.5)	370/4317 (8.6)	922/4317 (21.4)	2872/4317 (66.5)
Cardiology	256/3583 (7.1)	914/3583 (25.5)	331/3583 (9.2)	2082/3583 (58.1)	1069/3622 (29.5)	751/3622 (20.7)	1449/3622 (40.0)	353/3622 (9.8)
Colon and rectal surgery	56/492 (11.4)	251/492 (51.0)	41/492 (8.3)	144/492 (29.3)	73/499 (14.6)	311/499 (62.3)	80/499 (16.0)	35/499 (7.0)
Dermatology	298/919 (32.4)	432/919 (47.0)	84/919 (9.1)	105/919 (11.4)	255/929 (27.4)	178/929 (19.2)	419/929 (45.1)	77/929 (8.3)
Emergency medicine	436/5358 (8.1)	1486/5358 (27.7)	779/5358 (14.5)	2657/5358 (49.6)	3427/5389 (63.6)	55/5389 (1.0)	1657/5389 (30.8)	250/5389 (4.6)
Family medicine	986/9458 (10.4)	2834/9458 (30.0)	1416/9458 (15.0)	4222/9458 (44.6)	4776/9543 (50.1)	284/9543 (3.0)	3305/9543 (34.6)	1178/9543 (12.3)
Gastroenterology	205/1944 (10.5)	673/1944 (34.6)	192/1944 (9.9)	874/1944 (45.0)	752/1959 (38.4)	363/1959 (18.5)	676/1959 (34.5)	168/1959 (8.6)
General practice	179/1395 (12.8)	424/1395 (30.4)	152/1395 (10.9)	640/1395 (45.9)	574/1405 (40.9)	107/1405 (7.6)	582/1405 (41.4)	142/1405 (10.1)
General surgery	1574/10 416 (15.1)	4769/10 416 (45.8)	896/10 416 (8.6)	3177/10 416 (30.5)	1560/10 515 (14.8)	6921/10 515 (65.8)	1429/10 515 (13.6)	605/10 515 (5.8)
Internal medicine	813/10 084 (8.1)	2673/10 084 (26.5)	1309/10 084 (13.0)	5289/10 084 (52.4)	5059/10 211 (49.5)	204/10 211 (2.0)	3915/10 211 (38.3)	1033/10 211 (10.1)
Neurology	110/1226 (9.0)	408/1226 (33.3)	347/1226 (28.3)	361/1226 (29.4)	669/1238 (54.0)	16/1238 (1.3)	463/1238 (37.4)	90/1238 (7.3)
Neurosurgery	292/2694 (10.8)	1351/2694 (50.2)	674/2694 (25.0)	377/2694 (14.0)	294/2726 (10.8)	1962/2726 (72.0)	335/2726 (12.3)	135/2726 (5.0)
Obstetrics and gynecology	2013/14 547 (13.8)	6032/14 547 (41.5)	3681/14 547 (25.3)	2821/14 547 (19.4)	1736/14 715 (11.8)	3829/14 715 (26.0)	1296/14 715 (8.8)	7854/14 715 (53.4)
Ophthalmology	415/2481 (16.7)	1508/2481 (60.8)	490/2481 (19.8)	68/2481 (2.7)	477/2492 (19.1)	1313/2492 (52.7)	523/2492 (21.0)	179/2492 (7.2)
Orthopedics	1591/8005 (19.9)	4988/8005 (62.3)	869/8005 (10.9)	557/8005 (7.0)	1151/8104 (14.2)	5055/8104 (62.4)	1499/8104 (18.5)	399/8104 (4.9)
Otolaryngology	381/2011 (18.9)	1089/2011 (54.2)	225/2011 (11.2)	316/2011 (15.7)	313/2032 (15.4)	1281/2032 (63.0)	316/2032 (15.6)	122/2032 (6.0)
Pathology	137/1033 (13.3)	428/1033 (41.4)	201/1033 (19.5)	267/1033 (25.8)	915/1052 (87.0)	16/1052 (1.5)	47/1052 (4.5)	74/1052 (7.0)
Pediatrics	269/2531 (10.6)	881/2531 (34.8)	617/2531 (24.4)	764/2531 (30.2)	1531/2553 (60.0)	54/2553 (2.1)	764/2553 (29.9)	204/2553 (8.0)
Plastic surgery	907/2549 (35.6)	1349/2549 (52.9)	109/2549 (4.3)	184/2549 (7.2)	111/2569 (4.3)	1882/2569 (73.3)	369/2569 (14.4)	207/2569 (8.1)
Psychiatry	325/1301 (25.0)	220/1301 (16.9)	85/1301 (6.5)	671/1301 (51.6)	131/1320 (9.9)	10/1320 (0.8)	737/1320 (55.8)	442/1320 (33.5)
Pulmonology	29/981 (3.0)	189/981 (19.3)	127/981 (12.9)	636/981 (64.8)	456/986 (46.2)	43/986 (4.4)	390/986 (39.6)	97/986 (9.8)
Radiology	724/5850 (12.4)	2429/5850 (41.5)	1050/5850 (17.9)	1647/5850 (28.2)	4972/5923 (83.9)	216/5923 (3.7)	433/5923 (7.3)	302/5923 (5.1)
Thoracic surgery	123/1452 (8.5)	501/1452 (34.5)	192/1452 (13.2)	636/1452 (43.8)	163/1464 (11.1)	966/1464 (66.0)	243/1464 (16.6)	92/1464 (6.3)
Urology	378/2335 (16.2)	1163/2335 (49.8)	250/2335 (10.7)	544/2335 (23.3)	554/2365 (23.4)	1201/2365 (50.8)	486/2365 (20.6)	124/2365 (5.2)
Other	1634/12 932 (12.6)	4415/12 932 (34.1)	2083/12 932 (16.1)	4800/12 932 (37.1)	4178/13 138 (31.8)	2473/13 138 (18.8)	4818/13 138 (36.7)	1669/13 138 (12.7)

^a Severity-of-injury outcomes and the current allegation type categories were included in National Practitioner Data Bank malpractice payment reports starting on January 31, 2004. From January 31, 2004, to December 31, 2014, there were a total of 111 066 paid claims. For 1201 paid claims during this period, the outcome was listed as unable to be determined, and so these claims were excluded from the outcomes analysis.

^b Minor physical or emotional injury was defined as scores of 1-3 on the National Association of Insurance Commissioners' scale, significant physical injury as scores of 4-6, major physical injury as scores of 7 or 8, and death as a score of 9.

which emphasized the limited epidemiologic understanding of diagnostic errors.³⁷

The variation in malpractice trends across specialties presents an opportunity for further analysis to understand the reasons and to identify strategies for improvement. For ex-

ample, cardiology had the smallest decrease in the rate of paid claims, which may be associated with the increase in the number of interventional cardiology procedures. One study showed that 38.5% of all malpractice claims against cardiologists involved a procedure,⁸ and the volume of interventional

cardiology procedures increased during the study period.^{38,39} Another analysis found an increase in the number of malpractice cases associated with cardiac catheterization between 1990 and 2009.⁴⁰

More generally, specialty-specific information about paid claims may help inform decisions about the approaches needed to simultaneously improve patient safety and reduce liability. For example, a multifaceted patient safety program within obstetrics was developed by targeting high-risk liability areas and significantly reduced malpractice claims and the amount paid on claims.⁴¹ Many aspects of this program—including the development of protocols and guidelines, team training, review of adverse events by a patient safety committee, and establishing a system for anonymous event reporting—can and have been applied to other specialties.⁴²

Limitations

Our analysis has several limitations. First, because the NPDB contains only claims that result in payment on behalf of a physician in response to a written claim, we were unable to count claims for which no payment was made, that were settled without a written demand, or those in which payment was made solely on behalf of an institution. Second, some claims paid on behalf of physicians may not be reported to the NPDB, despite the legal requirement to do so. However, one comparison of data

on paid claims from a large malpractice insurer with data in the NPDB found only a very small discrepancy, suggesting that underreporting is not a major problem.⁴ Third, we used data from the AMA Masterfile to determine the number of physicians in each specialty in a given year, but these data do not account for the clinical volume of the physician, which could affect the physician's liability exposure. Fourth, the dates of reports to the NPDB are based on when the judgment or settlement leading to payment was made. Typically, the time elapsed between an injury occurring and resolution of the claim is 4 to 5 years,^{15,43} suggesting that NPDB data may be a lagging indicator of trends in paid claims and types of alleged injuries.

Conclusions

From 1992 to 2014, there was a marked reduction in the rate of malpractice claims paid on behalf of physicians, with a concurrent increase in both mean payment amounts (adjusted to 2014 dollars) and the rate of catastrophic payments. There were wide differences in rates of paid claims and characteristics of the alleged injuries across specialties. A better understanding of the causes of variation among specialties in paid malpractice claims may help reduce patient injury and physicians' risk of liability.

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