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Medical malpractice claims in radiation oncology: a population-based study 1985–2012

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Abstract

Purpose/Objective(s)—To determine trends in radiation oncology malpractice claims and expenses during the last 28 years and compare malpractice claims between radiation oncology and other specialties.

Methods and Materials—We performed a retrospective analysis of closed malpractice claims filed from 1985 to 2012 collected by a nationwide medical liability insurance trade association. We analyzed characteristics and trends among closed claims, indemnity payments (payments to plaintiff), and litigation expenses. We also compared radiation oncology to 21 other medical specialties. Time series dollar amounts were adjusted for inflation (2012 index year).

Results—There were 1,517 closed claims involving radiation oncology, of which 342 (22.5%) were paid. Average and median indemnity payments were \$276,792 and \$122,500, ranking 5th and 8th among the 22 specialty groups, respectively. Linear regression modeling of time trends showed decreasing total number of claims ($\beta = -1.96$ annually, $p = 0.003$), increasing average litigation expenses paid ($\beta = +\$1472$ annually, $p = 0.001$), and no significant change in average indemnity payments ($\beta = -\$681$, $p = 0.89$).

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Conclusions—Medical professional liability claims filed against radiation oncologists are not common and have declined in recent years. However, indemnity payments in radiation oncology are large relative to many other specialties. In recent years, the average indemnity payment has been stable, while litigation expenses have increased.

Introduction

The rationale for the medical malpractice liability system is to compensate patients injured due to negligent care and deter providers from practicing negligently¹. It is unclear whether this system improves patient safety and quality of care^{2,3}. Certainly, being sued for medical malpractice is a great concern to practicing physicians⁴. One study from a large liability insurer covering over 40,000 physicians found that 7.4% of all physicians face a malpractice claim in any given year, with 1.6% facing a claim resulting in payment⁵.

Despite media attention to catastrophic medical errors in radiation oncology^{6–9}, there are very few systematic studies of malpractice claims in the specialty. Elliot et al.¹⁰ evaluated 13 cases involving prostate brachytherapy, where claims typically involved an alleged breach of standard of care. Another study reviewing 20 malpractice suits involving a single expert reviewer identified the most common allegations as delays in diagnosis, breach of standard of care, or failure to obtain a second opinion¹¹. Neither of these studies reported the severity of claims or litigation expenses. Studies of malpractice claims filed against oncologists in lung cancer, head and neck cancers, skin cancer, and sarcoma^{12–17} have neglected implications for radiation oncology. Furthermore, these studies^{12–17} only describe cases that were formally adjudicated in court, representing only 8% of all filed malpractice claims.¹⁸

This study sought to determine trends in radiation oncology malpractice claims and expenses during the last 28 years. We also compared malpractice claims between radiation oncology and other specialties.

Methods and Materials

We performed a retrospective analysis of medical liability claims data from the Physician Insurers Association of America (PIAA) that identified a radiation oncologist as the primary defendant between January 1, 1985, and December 31, 2012. The PIAA is a non-profit trade association representing medical professional liability insurance companies who insure more than two-thirds of private practice physicians in the United States¹⁹. The PIAA Data Sharing Project (DSP) is a database containing information on over 278,000 closed medical liability claims from 25 participating companies, representing the largest independent database of medical liability claims with specialty-specific data¹⁹.

Primary outcome variables were closed claims, paid claims, percentage of closed claims resulting in indemnity payment to the plaintiff, average indemnity payments, and average litigation expenses for each year of the study period and for the most recent 10 years. A “claim” was defined as any written demand for monetary compensation by a patient or patient’s family stemming from an alleged injury during the patient’s medical care by the insured clinician. A claim was “closed” when there was a resolution by settlement, by court

verdict or arbitration, or when a claim was withdrawn, dropped, or dismissed without payment. Indemnity is defined as compensation "for loss or damage that has already occurred, or to guarantee through contractual agreement to repay another party for loss or damage that occurs in the future²⁰." Adjudicatory outcomes included whether the claim resulted in indemnity payment to the plaintiff ("paid claims"), was ended without payment ("no indemnity"), and amount of indemnity payment ("severity"). Litigation expenses ("expenses"), also known as loss adjustment expenses, were also analyzed. These expenses are related to the defense of a liability claim, including expenses paid in the process of administering or adjudicating a claim (such as investigative costs, attorney fees, expert witness fees, court costs, etc.^{19,21}).

First, we evaluated sued physician demographics as compared to the national radiation oncology workforce. Demographic information about the involved radiation oncologist was obtained by PIAA when available and released by the insurer. Because PIAA does not report the number of insured physicians, we used annual workforce data as reported in the American Medical Association (AMA) Physician Masterfile²² to estimate the number of active physicians in each specialty per year in the United States. National workforce data from calendar years 1987, 1990, 1994 and 2002 are not available in the AMA Physician Characteristics and Distribution publication; therefore, linear interpolation to impute the data for the missing years was performed because demographic data were provided in aggregate and variability in physician workforce data for each specialty is expected to be constant (stationary) with time^{23,24}. Demographic comparisons between sued radiation oncologists and the national radiation oncology workforce were performed using Pearson's chi-squared test for the entire study period as well as for the last 10 years (2003–2012) in order to evaluate recent demographic characteristics.

We then performed a cross-sectional comparison of claims closed during the study period for radiation oncology and 21 other medical specialties. Closed claims, paid claims, and average and median indemnity, and total indemnity were described for each specialty. Median indemnity payments were included when comparing specialties to represent the most common experience in each specialty due to outliers in the data²³. We calculated an estimated proportion of active physicians represented in the PIAA DSP by specialty, since the number of active physicians varies considerably by medical specialty. This was done by dividing the number of claims by the cumulative number of active physicians per "physician-year" during the period from AMA workforce data described above, representing the maximum proportion of physicians in each specialty that have a claim in the PIAA DSP. This exploratory analysis was a simple proportion, and not intended as a direct normalization/risk calculation because inherent population differences between the PIAA and AMA datasets preclude the latter.

Finally, we analyzed time trends of closed claims, paid claims, percentage of closed claims that were paid, average indemnity payments, and average litigation expenses for radiation oncology using simple linear regression and log-linear regression. These were reported as trend or annual change (β) and average annual percent change ($\exp(\beta) - 1$)²⁵. We also evaluated claims by associated personnel defined as any associated professional that was named in the claim.

All tests were performed using $\alpha=0.05$ and 95% confidence intervals. Time series dollar amounts were adjusted for inflation using the Consumer Price Index for All Urban Consumers for All Items with 2012 as the index year²⁶. Statistical analyses were conducted using SPSS software, version 22.0 (IBM Corp., Armonk, NY).

Results

From 1985 to 2012, 1,517 closed claims reported to the PIAA DSP involved radiation oncologists, of which 342 (22.5%) were paid. Table 1 shows demographics of sued radiation oncologists compared with active physicians. Sued radiation oncologists were primarily in solo practice (72.2%), and were more likely to be middle aged (ages 35–54, $p<0.001$) as compared with national workforce demographic data. The proportion of physicians sued previously was 71.9% and 91.9% of sued physicians were board certified. However these physicians represent only 41.5% and 51.0% of sued physicians because only about 50% of claims reported these data. Sued radiation oncologists were more likely to be male ($p<0.001$), and international medical graduates (IMGs) ($p=0.002$). In the last 10 years, there was no difference in the proportion of international medical graduates sued as compared to the national workforce ($p=0.41$), and a smaller proportion of sued physicians were in solo practice (52% vs. 72% for 1985–2012).

Radiation oncology had the fewest number of closed claims ($<1\%$) among all reported specialties during the 28-year period (Table 2). Only 22.5% of closed claims resulted in indemnity payment, ranking radiation oncology 18th of 22 specialties in percentage of closed claims paid. The specialties with the highest percentage of closed claims paid were obstetrics and gynecology, general surgery, and otorhinolaryngology (34.2%, 33.4%, and 33.2%, respectively); gastroenterology ranked last (18.1%).

The average indemnity payment per claim for radiation oncology was \$276,972, ranking radiation oncology 5th of 22 specialties. The median indemnity payment was lower than the average indemnity payment for all specialties (Figure 1). Total payments for radiation oncology claims (\$94,661,971) represented fewer than 1% of total payments for all specialties during the study period (\$17,895,699,524). The median indemnity payment for radiation oncology was \$122,500, ranking radiation oncology 8th of 22 specialties. The specialties with the highest median indemnity were neurosurgery (\$183,735) and neurology (\$175,000); dermatology had the lowest median payment of only \$35,000.

Estimates of the proportion of physicians in each specialty that had closed and paid claims in the PIAA DSP are presented in Table 3. These estimates show that the maximum proportion of the radiation oncology workforce represented in the DSP is 2.4% for closed claims and 0.68% for paid claims. Table 4 shows the trends of radiation oncology closed claims, payments, and expenses over time from 1985 to 2012 and 2003 to 2012. The number of radiation oncology closed claims decreased over time ($\beta = -1.96$ claims annually, $p=0.003$; -3.5% annually, $p=0.003$), the percent paid of closed claims increased ($\beta = 0.73\%$ annually, $p=0.006$; $+2.8\%$ annually, $p=0.046$), and average expenses paid increased ($\beta = \$1472$ annually, $p = 0.001$; $+5.0\%$ annually, $p<0.001$). No significant trend was observed for the average indemnity paid ($p=0.89$) (Figures 2a and 2b). No significant trend was observed for

total indemnity or expenses, or total expenses for paid claims. Over the last 10 years, no significant trends were observed (Table 4).

During the last 10 years, the two most common associated personnel named in closed claims included physicians (including radiologists, emergency medicine physicians, pathologists, and unspecified 'other' physicians; named 140 times) and therapists (named 7 times). Up to three associated personnel are reported for each record so it is unclear how many individual claims reported associated personnel.

Discussion

The current study is the first comprehensive analysis of nation-wide medical liability claims data for radiation oncology, spanning 28 years. When comparing sued radiation oncologists in the PIAA DSP to the national radiation oncology workforce, we found that a greater proportion of sued physicians were male, and that only 5–6% of sued female physicians reported working part-time which is less than national estimates (17.5%)²⁷. The larger proportion of males working full time may have influenced the gender of sued physicians, however the changing gender demographics of the radiation oncology workforce likely played a larger role; a greater number of claims were closed early in the study period when men represented a greater proportion of the workforce²². Our data show that the proportion of claims attributable to IMGs has decreased consistent with the proportion of IMGs in the radiation oncology workforce also decreasing from 31% in 1985 to 14% in 2012. We also found that the proportion of solo practitioners, compared with other practice types, was high amongst sued physicians. Data from the ACR survey between 1995–2003 shows relatively stable numbers of solo practitioners (8–11%)^{27,28} and recent NPPES data²⁹ show that 12.5% of 4503 individual radiation oncologists were sole proprietors. Our study found that the proportion of claims attributed to solo practitioners has dropped from 72% overall to 52% for the last 10 years. Radiation oncology practice accreditation through ACR-ASTRO³⁰, requiring peer review documentation, is one possible reason for reduction in claims by introducing increased quality assurance and peer review.

Radiation oncology-related liability claims represent fewer than 1% of all reported closed claims. We expect that this number would be <1% because radiation oncology physician-years during the study period also represent <1% of all physician-years for all specialties. Despite a growing physician workforce and patient population³¹ over the study period, the number of closed claims has recently declined by approximately 2% per year, and the number of paid claims has also decreased, though this trend was not significant. Our findings are similar, though to a lesser extent, to recent reports on the NPDB showing the number of closed and paid claims dropped 34% and 38%, respectively, in the last 10 years³². Previous authors have also found that payment amounts have not changed significantly in recent years^{32,33}. Indemnity payments in radiation oncology are large relative to many other specialties, though we also found that these payments have been stable over time.

A recent decrease in the volatility of insurance premiums has also been observed³⁴. In addition to other market factors, increased expenses have historically been associated with

rising premiums and decreased availability of malpractice insurance³⁵. While we don't report on insurance premiums, we found that litigation expenses for all radiation oncology closed claims continued to rise on average from 1985 to 2012 for both paid claims and claims with no indemnity, though they have stabilized in the last 10 years. The 2010 final report³⁶ by the Centers for Medicare and Medicaid Services on malpractice relative value units by specialty reflects the relative costs to practitioners of professional liability insurance. This report ranked radiation oncology as having a greater non-surgical risk than 32 of 37 non-surgical specialties. For surgical risk, radiation oncology ranked 15 of 46 specialties. Our data are consistent with CMS estimates that radiation oncology has higher non-surgical risk which may lead to higher payments, but less overall risk due to a lower risk factor associated with surgical procedures, thereby resulting in fewer claims³⁶.

Recent PIAA DSP data on all physician specialties¹⁸ showed physicians faced an 8% increase in expenses from 2003 to 2012, and that expenses increased at a rate 2.5 times that of total indemnity payments. For our more recent data regarding total indemnity (2003–2012), data by year are unavailable so we are limited in our ability to comment on trends in indemnity payments without the possible influence of outliers. We also found that other physicians and technicians were the most common associated personnel named in claims. The involvement of associated personnel seems appropriate given the team-based environment in which radiation oncology is practiced, although we cannot comment on what types of claims involved other personnel due to the aggregate nature of the data.

Our study adds to the current literature by providing a large systematic analysis of closed (paid and unpaid) malpractice claims in the United States. Most prior studies of oncology claims have evaluated jury verdicts^{10,12–15}, which are limited to approximately 8% of closed claims¹⁸. A prior study about claims in lung cancer patients also using PIAA data does not provide specific information on radiation oncology¹⁶. NPDB analyses do not include physician specialty, sufficient data regarding the nature of claims, or information on claims that were not paid²¹, and represent approximately 30% of all claims filed^{33,21}. Furthermore, PIAA DSP data, while not generalizable given the lack of exposure data, do represent a greater proportion of the physician workforce than studies based on single or small numbers of insurance firms.

Our study has several limitations, many of which are inherent to the source data from the PIAA DSP. The most significant limitation is absence of exposure data. All information in the PIAA DSP database is reported on a per claim basis. They do not report the number of insured physicians in a given year, so it is not possible to directly calculate claims frequency per physician. We used the AMA Masterfile data for active physicians by specialty to understand what percentage of the national workforce was represented as having a closed claim in the PIAA DSP, but these data do not generalize beyond the DSP. Similarly, we compared differences in demographic information among sued radiation oncologists to the national radiation oncology workforce, but again these comparisons are limited in their generalizability beyond the DSP given the selection bias of the data that we are unable to evaluate. A second major limitation is that PIAA member companies have guidelines to ensure that there is consistency and uniformity in data collection and reporting, but there may certainly be errors in such a registry. However, McLean et al.¹⁶ analyzed PIAA coding

used to aggregate data in the DSP and found only minor differences between the dataset and available case abstracts for malpractice litigation in the setting of lung cancer, suggesting the data for radiation therapy in the present study are likely to be representative of liability claims. Additionally, PIAA DSP aggregation of data without claim-specific or variance measures limit our ability to analyze and draw conclusions from the data presented. Still, the PIAA DSP database is the only national database that provides specialty-specific information on malpractice claims as well as information on closed claims that were not paid.

Our study, while important, demonstrates the need for additional, detailed analyses of the underlying causes of claims in radiation oncology to guide translation of these findings to risk reduction, preventing malpractice claims and improving patient safety³⁷. Malpractice continues to be a significant concern for physicians, policy-makers and patients alike, as the rapidly evolving healthcare environment and ongoing legal battles surrounding malpractice reform add uncertainty to the future. While medical professional liability claims filed against radiation oncologists are not common, and the annual number of closed claims has declined, litigation expenses have increased and indemnity payments in radiation oncology are high relative to many other specialties. This evidence can inform efforts by physicians and national organizations interested in improving patient safety, decreasing costs of care, and minimizing risk.

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Appendix A. Annual characteristics of radiation oncology closed claims, 1985–2012

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Close Year	Closed Claims*	Paid Claims†	% Paid of Closed Claims	Total Indemnity Paid††	Average Indemnity Paid††	Total Expenses - All Closed Claims††	Average Expenses - All Closed Claims††	Total Expenses - Paid Claims††	Average Expenses - Paid Claims††	Total Expenses - No Indemnity††	Average Expenses - No Indemnity††
1985	103	30	29.1%	\$4,216,912	\$140,564	\$942,406	\$9,150	\$334,182	\$11,139	\$608,224	\$8,332
1986	92	16	17.4%	\$5,932,780	\$370,799	\$1,598,860	\$17,379	\$500,081	\$31,255	\$1,098,779	\$14,458
1987	132	11	8.3%	\$5,697,868	\$517,988	\$1,261,349	\$9,556	\$334,407	\$30,401	\$926,942	\$7,661
1988	72	12	16.7%	\$2,415,897	\$201,325	\$983,825	\$13,664	\$251,804	\$20,984	\$732,021	\$12,200
1989	56	6	10.7%	\$476,890	\$79,482	\$715,685	\$12,780	\$193,241	\$32,207	\$522,444	\$10,449
1990	28	5	17.9%	\$1,901,083	\$380,217	\$897,674	\$32,060	\$505,185	\$101,037	\$392,489	\$17,065
1991	21	1	4.8%	\$927,300	\$927,300	\$462,443	\$22,021	\$42,703	\$42,703	\$419,740	\$20,987
1992	42	12	28.6%	\$5,022,453	\$418,538	\$1,050,446	\$25,011	\$491,083	\$40,924	\$559,363	\$18,645
1993	61	13	21.3%	\$3,224,980	\$248,075	\$1,864,954	\$30,573	\$452,226	\$34,787	\$1,412,727	\$29,432
1994	70	19	27.1%	\$5,431,341	\$285,860	\$3,158,611	\$45,123	\$1,941,038	\$102,160	\$1,217,573	\$23,874
1995	50	9	18.0%	\$4,011,456	\$445,717	\$856,659	\$17,133	\$332,584	\$36,954	\$524,074	\$12,782
1996	63	10	15.9%	\$3,642,046	\$364,205	\$2,061,835	\$32,728	\$430,736	\$43,074	\$1,631,099	\$30,775
1997	100	18	18.0%	\$11,007,063	\$611,504	\$2,919,917	\$29,199	\$803,115	\$44,618	\$2,116,802	\$25,815
1998	78	21	26.9%	\$10,152,242	\$483,440	\$1,630,543	\$20,904	\$623,949	\$29,712	\$1,006,594	\$17,660
1999	88	23	26.1%	\$7,395,081	\$321,525	\$3,772,188	\$42,866	\$2,074,997	\$90,217	\$1,697,192	\$26,111
2000	39	13	33.3%	\$6,934,933	\$533,456	\$1,329,486	\$34,089	\$1,013,116	\$77,932	\$316,370	\$12,168
2001	39	12	30.8%	\$6,372,511	\$531,043	\$1,361,719	\$34,916	\$863,144	\$71,929	\$498,575	\$18,466
2002	21	9	42.9%	\$2,250,864	\$250,096	\$1,086,913	\$51,758	\$470,959	\$52,329	\$615,955	\$51,330
2003	44	7	15.9%	\$2,061,267	\$294,467	\$758,090	\$17,229	\$274,817	\$39,260	\$483,273	\$13,061
2004	33	13	39.4%	\$11,431,328	\$879,333	\$1,460,579	\$44,260	\$804,026	\$61,848	\$656,553	\$32,828
2005	34	13	38.2%	\$5,576,519	\$428,963	\$1,240,191	\$36,476	\$588,580	\$45,275	\$651,611	\$31,029
2006	27	8	29.6%	\$1,466,463	\$183,308	\$1,399,207	\$51,822	\$569,972	\$71,246	\$829,235	\$43,644
2007	40	14	35.0%	\$6,625,672	\$473,262	\$2,282,798	\$57,070	\$1,493,022	\$106,644	\$789,776	\$30,376
2008	36	19	52.8%	\$8,465,816	\$445,569	\$1,731,377	\$48,094	\$1,259,247	\$66,276	\$472,130	\$27,772
2009	26	10	38.5%	\$2,482,618	\$248,262	\$2,291,271	\$88,126	\$1,303,909	\$130,391	\$987,362	\$61,710
2010	26	9	34.6%	\$3,219,021	\$357,669	\$1,065,315	\$40,974	\$621,599	\$69,067	\$443,716	\$26,101
2011	18	5	27.8%	\$689,175	\$137,835	\$1,018,205	\$56,567	\$193,370	\$38,674	\$824,834	\$63,449
2012	78	4	5.1%	\$923,000	\$230,750	\$1,382,555	\$17,725	\$284,577	\$71,144	\$1,097,978	\$14,838

Close Year	Closed Claims	Paid Claims	% Paid of Closed Claims	Total Indemnity Paid ^{††}	Average Indemnity Paid ^{††}	Total Expenses - All Closed Claims ^{††}	Average Expenses - All Closed Claims ^{††}	Total Expenses - Paid Claims ^{††}	Average Expenses - Paid Claims ^{††}	Total Expenses - No Indemnity ^{††}	Average Expenses - No Indemnity ^{††}
Cumulative	1,517	342	22.5%	\$129,954,578	\$379,984	\$42,585,100	\$28,072	\$19,051,669	\$55,707	\$23,533,432	\$20,028

* Closed claims are medical liability claims that have been resolved through settlement or verdict or withdrawn, dropped or dismissed without payment.

[†] Paid Claims are medical liability claims that resulted in indemnity payment to the plaintiff as a result of settlement or court adjudication.

^{††} Adjusted for inflation, 2012 index year²⁶.

// Expenses are litigation expenses related to the defense of a liability claim, including expenses paid in the process of administering or adjudicating a claim.

Appendix B. Claims by Associated Personnel, 2003–2012

2003–2012					
Associated Personnel*	Closed Claims [†]	Paid Claims ^{††}	% Paid of Closed Claims	Total Indemnity ^{//}	Average Indemnity ^{//}
Other Physician	117	11	9.4%	\$4,744,999	\$431,364
Radiologist	20	3	15.0%	\$1,607,500	\$535,833
Other Person or Personnel	3	0	0.0%	\$0	\$0
Technician	7	3	42.9%	\$355,000	\$118,333
Consultant	3	1	33.3%	\$360,000	\$360,000
Emergency Medicine Physician	3	1	33.3%	\$360,000	\$360,000
Nurse	2	0	0.0%	\$0	\$0
Pathologist	2	0	0.0%	\$0	\$0
Other Therapist	2	0	0.0%	\$0	\$0
Physician's Assistant	2	0	0.0%	\$0	\$0
Other Office Personnel	1	0	0.0%	\$0	\$0
Physical Therapist	1	1	100.0%	\$38,000	\$38,000
Nurse Anesthetist	1	0	0.0%	\$0	\$0
Nurse Practitioner	1	1	100.0%	\$80,000	\$80,000
Manufacturer of Drug or Equipment	1	0	0.0%	\$0	\$0
Associated Personnel Total:	166	21	12.7%	\$7,545,499	\$359,309

* Any associated professional that was named in the claim. Up to three associated personnel can be reported for each record.

[†] Closed claims are medical liability claims that have been resolved through settlement or verdict or withdrawn, dropped or dismissed without payment.

^{††} Paid Claims are medical liability claims that resulted in indemnity payment to the plaintiff as a result of settlement or court adjudication.

^{//} Adjusted for inflation, 2012 index year²⁶.

Summary

The rationale for the medical malpractice liability system is to compensate patients injured due to negligent care and deter providers from practicing negligently. Limited evidence is available regarding experience with medical malpractice in radiation oncology. In this paper, we review characteristics and national trends in radiation oncology malpractice claims and their associated costs, and compare radiation oncology to other specialties. This study provides evidence that can be used to improve patient safety, minimize risk and influence policymaking relevant to radiation oncology.

Figure 1.
Characteristics of closed claims and indemnity payments by medical specialty, 1985–2012

Vertical bars (blue) represent average indemnity payment, with horizontal lines (black) indicating median indemnity for each specialty group during the period. Diamond markers (dark blue) illustrate the percent paid of closed claims--the percentage of all closed claims that were paid to the plaintiff as a result of settlement or court adjudication.

Figure 2.

a. Radiation oncology closed claims, 1985–2012: closed claims and paid claims

P-value represents significance of change in the number of claims over the time period modeled with linear regression.

b. Radiation oncology closed claims and litigation expenses, 1985–2012: average indemnity*, average expenses*, and percent paid of closed claims

*Adjusted for inflation, 2012 index year²⁶.

P-value represents significance of change over time modeled with linear regression.

Table 1

Radiation oncology physician demographics: PIAA sued physicians and the AMA physician workforce, 1985–2012 and 2003–2012

Radiation Oncologists: 1985-2012											Radiation Oncologists: 2003-2012													
PIAA *											AMA †		PIAA *					AMA †						
N											%		N		%		p-value††		N		%		p-value††	
Age Groups																								
<hr/>																								
≤35		121		8.0%		17,659		16.8%		<0.001		16		4.4%		6,418		14.1%		<0.001				
35-44		508		33.5%		31,740		30.2%				90		24.9%		11,320		24.9%						
45-54		557		36.7%		29,261		27.8%				179		49.4%		13,688		30.1%						
55-64		221		14.6%		18,118		17.2%				68		18.8%		9,387		20.6%						
65		110		7.3%		8,454		8.0%				9		2.5%		4,669		10.3%						
<hr/>																								
Total		1,517				105,226						362				45,482								
<hr/>																								
Employment Status																								
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Full-Time		1,284		98.3%		--		--		--		346		97.7%		--		--		--				
Part-Time		22		1.7%		--		--		--		8		2.3%		--		--		--				
<hr/>																								
Total		1,306				--						354				--								
<hr/>																								
Gender																								
<hr/>																								
Male		1,212		92.8%		81,845		77.8%		<0.001		315		89.0%		34,218		75.2%		<0.001				
Full-Time		1,196		98.7%		--		--				309		98.1%		--		--						
Part-Time		16		1.3%		--		--				6		1.9%		--		--						
Female		94		7.2%		23,381		22.2%				39		11.0%		11,264		24.8%						
Full-Time		88		93.6%		--		--				37		94.9%		--		--						
Part-Time		6		6.4%		--		--				2		5.1%		--		--						
<hr/>																								
Total		1,306				105,226						354				45,482								
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Board Certification																								
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	Radiation Oncologists: 1985–2012					Radiation Oncologists: 2003–2012				
	PIAA *		AMA †		p-value ^{††}	PIAA *		AMA †		p-value ^{††}
	N	%	N	%		N	%	N	%	
Board Certified	774	91.9%	82,022	77.9%	<0.001	225	86.9%	37,032	81.4%	0.02
Not Board Certified	68	8.1%	23,204	22.1%		34	13.1%	8,450	18.6%	
<i>Total</i>	842		105,226			259		45,482		
Previous Claims Experience										
Previous Claims Experience	631	71.9%	--	--	--	52	67.5%	--	--	--
No Previous Claims Experience	246	28.1%	--	--	--	25	32.5%	--	--	--
<i>Total</i>	877		--			77		--		
Medical School										
US Medical Graduate	1,155	76.4%	83,754	79.6%	0.002	292	81.6%	37,835	83.2%	0.41
International Medical Graduate	357	23.6%	21,472	20.4%		66	18.4%	7,647	16.8%	
<i>Total</i>	1,512		105,226			358		45,482		
Practice Type										
Group Practice	302	19.9%	--	--	--	86	23.9%	--	--	--
Solo Practice	1,094	72.2%	--	--	--	188	52.2%	--	--	--
Institution	119	7.9%	--	--	--	86	23.9%	--	--	--
<i>Total</i>	1,515		--			360		--		

Abbreviations: PIAA = Physician Insurers Association of America; AMA=American Medical Association

* Represents insured as reported on a per claim basis that released demographic information.

† Cumulative active radiation oncology physicians for all years (physician-years) calculated using the annual number of active physicians reported in the AMA masterfile²².

†† P-value for Pearson's chi-squared test ($\alpha=0.05$, 95% CI)

-- not available

Table 2
Characteristics of closed claims and indemnity payments by medical specialty, 1985–2012

Cumulative Closed Claims							
Medical Specialty	Closed Claims *	Paid Claims †	% Paid of Closed Claims ††	Total Indemnity Payment¶	Average Indemnity Payment¶	Median Indemnity Payment	Largest Indemnity Payment
Anesthesiology	11,030	3,470	31.5%	\$856,516,675	\$246,835	\$96,774	\$5,048,678
Cardiology	5,371	1,032	19.2%	\$271,207,784	\$262,798	\$156,250	\$2,000,000
Cardiothoracic Surgery	7,948	1,900	23.9%	\$457,058,679	\$240,557	\$125,000	\$5,005,000
Dermatology	3,198	906	28.3%	\$130,900,558	\$144,482	\$35,000	\$3,000,000
Emergency Medicine	6,887	1,864	27.1%	\$461,440,009	\$247,554	\$120,000	\$2,000,000
Gastroenterology	3,521	661	18.8%	\$170,353,285	\$257,721	\$119,559	\$4,000,000
General and Family Practice	30,453	9,639	31.7%	\$1,703,213,764	\$176,700	\$82,246	\$7,239,248
General Surgery	29,400	9,822	33.4%	\$1,978,471,304	\$201,433	\$99,999	\$3,116,180
Internal Medicine	37,216	9,271	24.9%	\$2,106,112,462	\$227,172	\$101,400	\$12,000,000
Neurology	4,474	979	21.9%	\$326,529,544	\$333,534	\$175,000	\$5,000,000
Neurosurgery	6,443	1,814	28.2%	\$599,483,751	\$330,476	\$183,735	\$5,600,000
Obstetrics and Gynecology	40,266	13,761	34.2%	\$3,959,561,785	\$286,324	\$149,250	\$13,000,000
Ophthalmology	7,893	2,232	28.3%	\$429,207,088	\$192,297	\$100,000	\$3,550,000
Orthopedic Surgery	25,707	7,404	28.8%	\$1,329,643,166	\$179,584	\$90,000	\$3,000,000
Otorhinolaryngology	4,627	1,529	33.1%	\$336,006,438	\$219,756	\$100,000	\$4,199,329
Pathology	1,991	594	29.8%	\$158,426,561	\$266,711	\$137,500	\$2,700,000
Pediatrics	7,825	2,180	27.9%	\$618,020,900	\$283,496	\$126,251	\$5,250,000
Plastic Surgery	10,174	2,697	26.5%	\$333,545,019	\$123,673	\$50,000	\$2,000,000
Psychiatry	2,666	526	19.7%	\$84,278,265	\$160,225	\$55,000	\$2,375,000
Radiation Oncology	1,517	342	22.5%	\$94,662,971	\$276,792	\$122,500	\$2,700,000
Radiology	16,411	4,740	28.9%	\$1,088,473,008	\$229,636	\$100,000	\$3,364,156
Urologic Surgery	7,099	2,009	28.3%	\$402,586,508	\$200,391	\$100,000	\$3,200,000
All specialties	272,117	79,372	29.2%	\$17,895,699,524	\$225,221	\$100,000	\$13,000,000

* Closed claims are medical liability claims that have been resolved through settlement or verdict or withdrawn, dropped or dismissed without payment.

† Paid Claims are medical liability claims that resulted in indemnity payment to the plaintiff as a result of settlement or court adjudication.

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Percent paid of closed claims refers to the percentage of all closed claims that were paid to the plaintiff as a result of settlement or court adjudication.
Total indemnity is the sum of all indemnity payments during the period.
Average indemnity is the mean amount of award for paid claims during the period.

Table 3
Comparison of representation of the national physician workforce in the PIAA DSP by medical specialty, 1985–2012

Medical Specialty	Total physicians per year in the US ^{††} (physician-years)	Closed Claims*		Paid Claims [†]	
		Closed Claims*	Proportion of physicians with a closed claim in the PIAA DSP//	Paid Claims [†]	Proportion of physicians with a paid claim in the PIAA DSP//
Plastic Surgery	166,911	9,312	5.58	2,456	1.47
Cardiothoracic Surgery	89,818	4,962	5.52	917	1.02
Neurosurgery	139,304	5,954	4.27	1,698	1.22
Orthopedic Surgery	622,728	23,786	3.82	6,949	1.12
Obstetrics and Gynecology	1,083,903	37,682	3.48	13,034	1.20
Radiology	579,689	14,770	2.55	4,299	0.74
General Surgery	1,065,608	26,549	2.49	9,088	0.85
Radiation Oncology	105,226	2,531	2.41	715	0.68
Urologic Surgery	280,809	6,166	2.20	1,806	0.64
Otorhinolaryngology	257,287	4,360	1.69	1,417	0.55
Ophthalmology	489,935	7,378	1.51	2,097	0.43
Cardiology	548,966	7,724	1.41	1,826	0.33
General and Family Practice	2,326,387	29,031	1.25	9,215	0.40
Neurology	341,804	4,118	1.20	906	0.27
Dermatology	260,432	2,919	1.12	847	0.33
Anesthesiology	965,932	9,906	1.03	3,149	0.33
Gastroenterology	285,075	2,874	1.01	548	0.19
Internal Medicine	3,649,954	34,993	0.96	8,754	0.24
Emergency Medicine	635,639	4,926	0.77	1,268	0.20
Pediatrics	1,637,971	7,409	0.45	2,063	0.13
Pathology	500,270	1,795	0.36	519	0.10
Psychiatry	1,072,973	2,457	0.23	496	0.05

Abbreviations: PIAA = Physician Insurers Association of America; AMA=American Medical Association

* Closed claims are medical liability claims that have been resolved through settlement or verdict or withdrawn, dropped or dismissed without payment.

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[†] Paid Claims are medical liability claims that resulted in indemnity payment to the plaintiff as a result of settlement or court adjudication.

^{††} Calculated using the number of active physicians for each specialty in 2012 obtained from AMA masterfile data²²

^{//} Proportion of physicians with a closed or paid claim in the PIAA DSP is the number of closed or paid claims over the period divided by the number of physicians over the period in that specialty (physician-years), representing the maximum proportion of physicians in that specialty that have a claim in the DSP during the period.

Table 4

Trends of radiation oncology closed claims and litigation expenses, 1985–2012 and 2003–2012

Series	1985–2012			2003–2012		
	Trend*	Trend p-value	Average Annual % Change [†] p-value	Trend*	Trend p-value	Average Annual % Change [†] p-value
<i>Closed Claims</i>	–1.96	0.003	–3.57%	0.99	0.64	–0.39%
<i>Paid Claims</i>	–0.18	0.23	–0.80%	–0.558	0.30	–7.63%
<i>Percent Paid of Closed Claims</i>	0.73%	0.006	2.77%	–0.01%	0.56	–7.23%
<i>Total Indemnity^{††} - All Claims</i>	\$4,941	0.95	0.58%	–\$559,626	0.17	–16.86%
<i>Average Indemnity^{††} - All claims</i>	–\$681	0.89	0.22%	–\$36,080	0.13	–9.23%
<i>Total Expenses^{//††} - All Claims</i>	\$13,439	0.47	1.28%	\$22,872	0.71	2.02%
<i>Average Expenses^{//††} - All Claims</i>	\$1,472	<0.001	4.85%	\$1,291	0.60	2.41%
<i>Total Expenses^{//††} - Paid Claims</i>	\$16,421	0.18	3.08%	–\$12,446	0.82	–4.29%
<i>Average Expenses^{//††} - Paid Claims</i>	\$1,742	0.008	3.88%	\$2,308	0.50	3.34%
<i>Total Expenses^{//††} - No Indemnity Paid</i>	–\$2,982	0.78	–0.18%	\$35,319	0.16	4.29%
<i>Average Expenses^{//††} - No Indemnity Paid</i>	\$1,105	0.044	4.43%	\$1,559	0.44	3.54%

* Trend over time modeled with linear regression.

[†] Trend over time modeled with log-linear regression²⁵.^{††} Adjusted for inflation, 2012 index year²⁶.^{//} Expenses are litigation expenses related to the defense of a liability claim, including expenses paid in the process of administering or adjudicating a claim.