

Characteristics of Medical Professional Liability Claims in Patients With Cardiovascular Diseases

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This report presents data describing a large cohort of closed cardiovascular medical professional liability (MPL) claims. The Physician Insurers Association of America established a registry of closed MPL claims in 1985. This registry contains data describing 230,624 closed claims for 28 medical specialties through 2007. The registry is maintained to support educational programs designed to improve the quality of care and to reduce patient injury and MPL claims. In this report, descriptive techniques are used to present summary information for the medical cardiovascular claims in the registry. Of 230,624 closed claims, 4,248 (1.8%) involved cardiovascular medical physicians. Of the 4,248 closed cardiovascular medical claims, 770 (18%) resulted in indemnity payments, and the average indemnity payment was \$248,291. In the entire database, 30% of closed claims were paid, and the average indemnity payment was \$204,268. The most common allegation among cardiovascular closed claims was diagnostic error, and the most prevalent diagnosis was coronary atherosclerosis. Claims involving cardiac catheterization and coronary angioplasty represented 12% and 7% of the cardiovascular closed claims. Aortic aneurysms and dissections, although relatively infrequent as clinical events, represent a substantial MPL risk because of the high percentage of paid claims (30%) and the very high average indemnity payment of \$417,298. In conclusion, MPL issues are common and are important to all practicing cardiologists. Detailed knowledge of risks associated with liability claims should assist practicing cardiologists in improving the quality of care, reducing patient injury, and reducing the incidence of claims. © 2010 Elsevier Inc. All rights reserved. (Am J Cardiol 2010;105:745–752)

The risk for medical professional liability (MPL) claims is a daily consideration in cardiovascular (CV) medicine. The minimization of liability risk is a worthy goal for all practitioners, and evidence from other specialties suggests that educational efforts and other strategies aimed at increasing practitioners' understanding of their liability risks may reduce those risks.¹ The purpose of this report is to present a summary of the CV physician professional liability claims experience of a consortium of MPL insurance companies to increase CV physicians' awareness of the details of the problem of MPL. The data presented in this report were collected by the Physician Insurers Association

of America (PIAA), an association of 50 MPL insurance carriers that are owned and operated by physicians and dentists. PIAA-affiliated companies provide MPL insurance coverage for approximately 60% of physicians in private practice in the United States.²

Methods

The PIAA maintains a data registry, the Data Sharing Project (DSP), of MPL claim information voluntarily submitted by its member organizations on a twice-yearly basis. (A claim is defined as a written demand for compensation in the form of money or services, with no legal papers having been filed in court.) Currently, 21 of 50 member organizations report claims data to the PIAA-DSP. The data are submitted to the PIAA in a codified format. The PIAA provides the reporting companies with explicit definitions of the data elements requested for inclusion in the registry. Diagnostic information is submitted using the *International Classification of Diseases, Ninth Revision, Clinical Modification*.³ To simplify reporting, the PIAA aggregates data within broad diagnostic categories. For example, all cases of acute myocardial infarction, codes 410.00 to 410.92, are classified together for the purposes of reporting and analysis. Original detailed classification data are maintained in the registry. Procedures are reported to the PIAA using the *International Classification of Diseases* coding system as well as PIAA-designated procedure codes.

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Table 1
Comparative claim payments: Physician Insurers Association of America Data Sharing Project (PIAA-DSP) registry, 1985 to 2007*

Specialty	Closed Claims	Paid Claims	% Paid to Closed	Total Indemnity	Average Indemnity	Median Indemnity	Largest Payment
Anesthesiology	8,866	2,875	32%	\$636,193,819	\$221,285	\$75,000	\$5,048,678
Cardiovascular and thoracic surgery	6,960	1,642	24%	\$356,739,943	\$217,259	\$100,000	\$4,247,423
Cardiology	4,248	770	18%	\$191,183,963	\$248,291	\$150,000	\$1,950,000
Dentistry	838	365	44%	\$14,869,780	\$40,739	\$15,000	\$1,000,000
Dermatology	2,620	757	29%	\$101,440,748	\$134,004	\$32,500	\$3,000,000
Emergency medicine	3,991	1,049	26%	\$202,049,937	\$192,612	\$75,000	\$2,000,000
Gastroenterology	2,354	425	18%	\$88,121,039	\$207,344	\$95,000	\$2,900,000
General and family practice	26,658	8,535	32%	\$1,365,943,314	\$160,040	\$75,000	\$4,089,414
General surgery	24,177	8,299	34%	\$1,488,680,092	\$179,381	\$84,645	\$3,116,180
Gynecology	2,723	832	31%	\$128,846,958	\$154,864	\$53,750	\$2,000,000
Internal medicine	31,299	7,902	25%	\$1,644,739,599	\$208,142	\$100,000	\$9,780,000
Neurology	3,656	775	21%	\$245,989,868	\$317,406	\$150,000	\$5,000,000
Neurosurgery	5,431	1,530	28%	\$477,770,521	\$312,268	\$165,000	\$5,600,000
Obstetrics and gynecology	31,486	11,118	35%	\$3,086,138,311	\$277,580	\$125,000	\$5,330,000
Ophthalmology	6,703	1,925	29%	\$347,735,112	\$180,642	\$95,000	\$3,550,000
Oral surgery	62	20	32%	\$538,583	\$26,929	\$13,000	\$133,500
Orthopedics	21,848	6,375	29%	\$1,042,180,835	\$163,479	\$78,000	\$3,000,000
Nonsurgical specialties	2,234	513	23%	\$96,717,958	\$188,534	\$50,000	\$8,749,980
Otorhinolaryngology	3,819	1,200	31%	\$241,644,424	\$201,370	\$95,000	\$4,000,000
Paraprofessional	376	87	23%	\$18,194,867	\$209,136	\$90,000	\$1,322,290
Pathology	1,633	461	28%	\$112,847,595	\$244,789	\$116,000	\$2,700,000
Pediatrics	6,794	1,897	28%	\$505,084,556	\$266,254	\$115,000	\$4,418,041
Plastic surgery	8,683	2,281	26%	\$262,301,626	\$114,994	\$45,000	\$1,650,000
Psychiatry	2,276	458	20%	\$74,568,108	\$162,812	\$55,000	\$2,375,000
Radiation therapy	2,212	620	28%	\$172,036,688	\$277,479	\$130,625	\$2,700,000
Radiology	12,970	3,787	29%	\$736,138,969	\$194,386	\$85,000	\$3,125,000
Resident	130	42	32%	\$2,515,932	\$59,903	\$62,500	\$200,000
Urology	5,577	1,640	29%	\$285,762,192	\$174,245	\$87,500	\$3,200,000
Total	230,624	68,180	30%	\$13,926,975,337	\$204,268	\$90,000	\$9,780,000

* Source: PIAA Cardiovascular Risk Management Review, 2008.

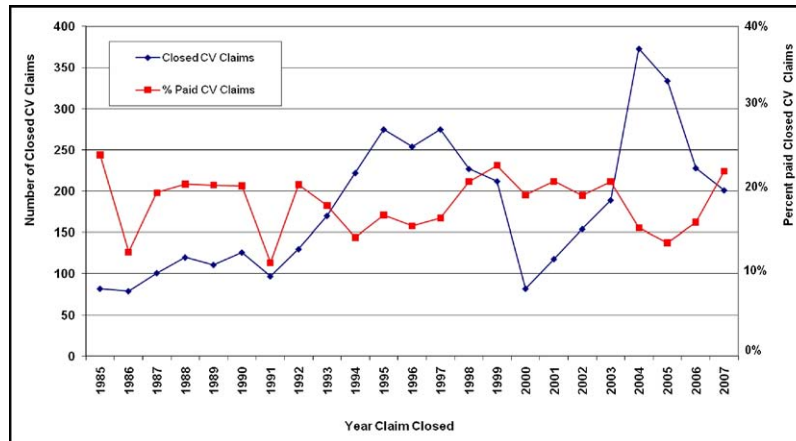


Figure 1. Trend lines of numbers of closed claims and percentage of paid closed claims per year in the PIAA-DSP registry, 1985 to 2007.

With respect to the PIAA-DSP data, information is available on closed claims, those that have been resolved, either with or without payment to the claimant, through private agreement between the parties or by court action. Data are also collected describing the number of PIAA-DSP closed claims per 28 specifically identified physician specialties. Specialty-specific data are available that quantify the proportion of closed claims that ended in payments, the total indemnity payments, and the average, median, and largest payments made. (Indemnity payments are defined as mon-

neys paid to plaintiffs for damages incurred. An indemnity payment includes an amount equal to the economic recovery for expenses already incurred or expected to be incurred and may also include noneconomic damages.)

Claims are further characterized as involving 1 of 19 "medical misadventures." Medical misadventures are alleged principal departures from the standard of medical care.⁴ They are errors or omissions of diagnosis, treatment, procedure performance, supervision, and timeliness that result in putative injury to patients. The PIAA-DSP also

Table 2
Most prevalent medical misadventures in cardiovascular closed claims, 1985 to 2007*

Medical Misadventure	Closed Claims	Paid Claims	% Paid to Closed	Average Indemnity
None noted	892	46	5%	\$208,205
Diagnostic error	878	190	22%	\$305,797
Improper performance	647	129	20%	\$241,378
Failure to supervise case	550	95	17%	\$222,194
Medication errors	337	61	18%	\$194,560
Failure to recognize complication	185	48	26%	\$259,686
No indication or contraindication	152	34	22%	\$194,698
Failure to perform	142	36	25%	\$377,193
Delay in performance	90	24	27%	\$177,413
Failure or delay in referral or consultation	78	28	36%	\$260,163
Other	297	79	27%	\$289,911
Total	4,248	770	18%	\$248,291

* Source: PIAA Cardiovascular Risk Management Review, 2008.

codifies “no medical misadventure” for cases in which claims are brought against physicians who had little or no contact with the patients.

Patient diagnoses are recorded for the claims in the PIAA-DSP, and claims are further classified by the most common CV procedures implicated in the alleged professional liability. Data are also available in the PIAA-DSP regarding the severity of a claimant’s injury. Severity of injury is assigned to 1 of 9 categories as established by the National Association of Insurance Commissioners severity index: emotional injury only, insignificant injury, minor temporary injury, major temporary injury, minor permanent injury, significant permanent injury, major permanent injury, grave injury, and death.⁵

The PIAA-DSP registry contains data describing allegations specifying associated medical and legal issues, such as consent or communications issues. Twenty-nine such associated medical and legal issues are identified in the registry. The PIAA-DSP registry also contains data describing the area of expertise of any associated professional who may be named in the claim in question.

Results

At the end of 2008, the PIAA-DSP registry contained information on 230,624 closed claims. These claims were closed between 1985 and 2007. Of these closed claims, 4,248 (1.8%) involved medical CV cases.

Table 1 lists the claim payment analysis by 28 specialties for the PIAA-DSP registry of 230,624 closed claims. There were 4,248 closed claims involving CV medical specialists between 1985 and 2007. In total closed claims, CV medicine ranked 14th among the 28 medical specialties studied. Obstetrics and gynecology ranked first, with 31,486 closed claims, and oral surgery ranked 28th, with 62 closed claims.

Seven hundred seventy of the 4,248 CV medicine closed claims resulted in payments to the plaintiffs (18%). CV

Table 3
Most prevalent diagnoses in cardiovascular closed claims, 1985 to 2007*

Diagnosis	Closed Claims	Paid Claims	% Paid to Closed	Average Indemnity
Coronary atherosclerosis	493	82	17%	\$262,701
Acute myocardial infarction	435	85	20%	\$299,596
Chest pain not further defined	244	52	21%	\$277,990
Chronic ischemic heart disease	154	20	13%	\$241,162
Cardiac dysrhythmia	127	15	12%	\$276,774
Heart disease not further defined	121	26	21%	\$230,587
Heart failure	100	14	14%	\$175,474
Atrial fibrillation and flutter	99	15	15%	\$362,833
Disorders of lipid metabolism	98	0	0%	\$0
Aortic aneurysm	90	27	30%	\$417,298
Other	2,287	434	19%	\$186,786
Total	4,248	770	18%	\$248,291

* Source: PIAA Cardiovascular Risk Management Review, 2008.

Table 4
Severity of injury in cardiovascular claims, 1985 to 2007*

Severity of Injury	Closed Claims	Paid Claims	% Paid to Closed	Average Indemnity
Emotional injury only	222	4	2%	\$198,250
Insignificant injury	68	5	7%	\$59,080
Minor temporary injury	323	42	13%	\$49,346
Major temporary injury	453	57	13%	\$179,157
Minor permanent injury	287	45	16%	\$117,080
Significant permanent injury	303	56	18%	\$209,416
Major permanent injury	237	53	22%	\$367,236
Grave injury	106	32	30%	\$522,614
Death	2,249	476	21%	\$266,186
Total	4,248	770	18%	\$248,291

* Source: PIAA Cardiovascular Risk Management Review, 2008.

medicine and gastroenterology closed claims represented the lowest percentage of paid claims (those that have been resolved with indemnity payments to the plaintiffs) to closed claims for the 28 specialties studied, with 18% of claims paid. Claims against dentists resulted in payments in 44% of cases, and those against obstetricians and gynecologists resulted in payments in 35% of cases. The average ratio of paid claims to closed cases was 30% for all 28 specialties.

The average indemnity paid per claim for all specialty groups was \$204,268, and the median indemnity payment was \$90,000. The highest specialty average indemnity paid per claim was \$317,406, for neurology, and the lowest specialty average indemnity paid per claim was \$26,929, for oral surgery. The highest median indemnity paid was \$165,000, for neurosurgery, and the lowest median indemnity paid was \$13,000, for oral surgery. The average indemnity paid per claim for CV medicine was \$248,291 and was

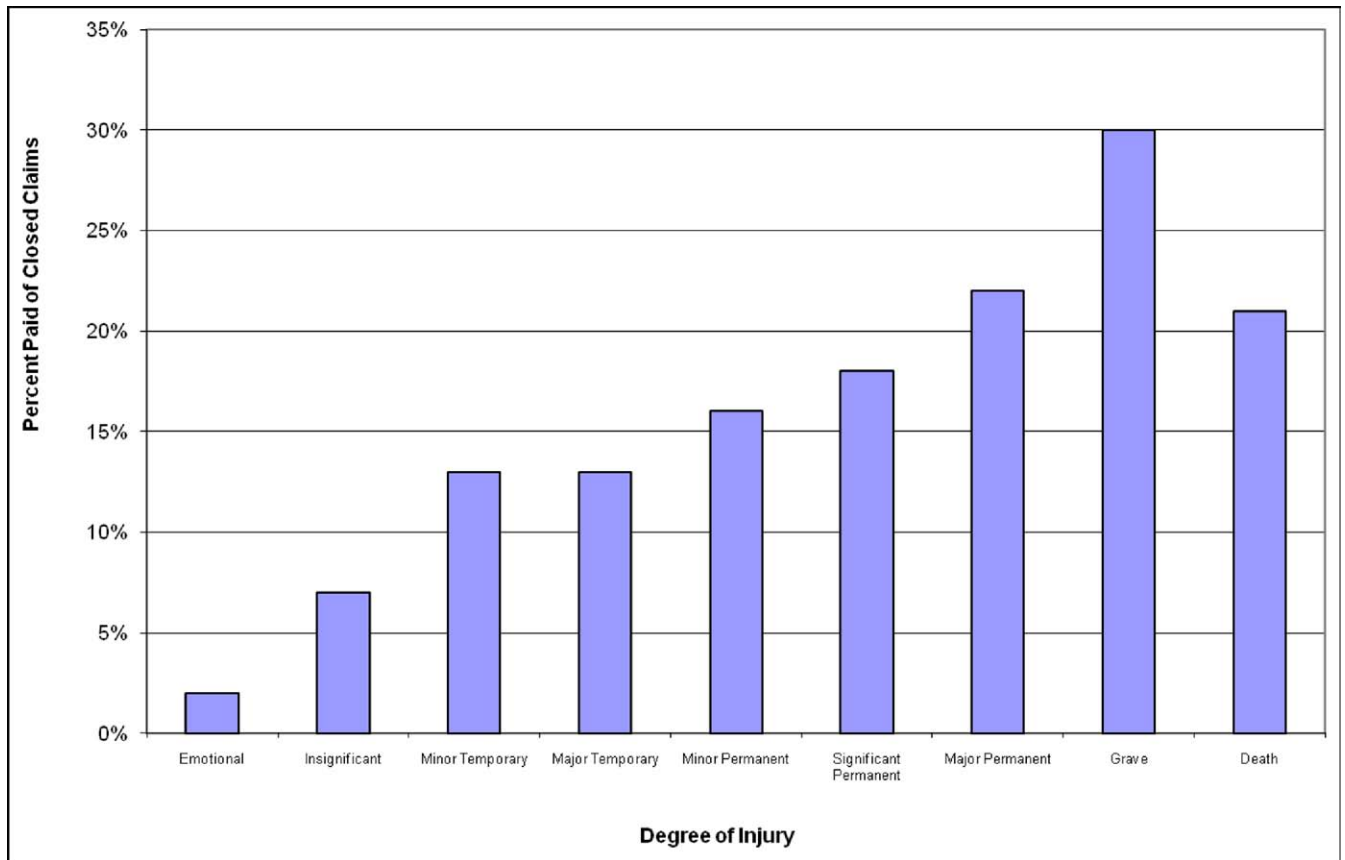


Figure 2. Histogram of degree of injury, measured by the severity index of the National Association of Insurance Commissioners, and the percentage of closed claims that resulted in payments to plaintiffs in the PIAA-DSP registry, 1985 to 2007.

the sixth highest among 28 specialties studied. The median indemnity paid for CV medicine claims was \$150,000 and, with neurology, was (after neurosurgery) the second highest median indemnity paid for 28 specialties.

The total indemnity paid between 1985 and 2007 was \$13.9 billion. The highest total indemnity for specialists was for obstetrics and gynecology, at \$3.1 billion; the lowest total indemnity for specialists was for oral surgery, at \$538,583. The total indemnity paid for CV medical specialists was \$191 million. CV medicine ranked 17th among 28 specialties in total indemnity paid.

The largest single payment in the PIAA-DSP registry (\$9,780,000) was for an internal medicine claim. On the opposite end of this spectrum, the largest payment for an oral surgery case was \$133,500. CV medicine ranked 23rd, with the single largest CV medicine payment of \$1,950,000.

Figure 1 shows the trends of closed CV medical claims and the percentage of paid closed CV claims from 1985 to 2007. The number of closed CV claims per year has varied from 97 in 1991 to 373 in 2004 in this time period. Peaks in closed claims occurrences are noted from 1995 to 1997 and again in 2004 and 2005. The percentage of paid closed CV claims has varied from 11% in 1991 to 24% in 1999. In general, there appears to be an inverse relation between the number of closed claims and the percentage of closed claims with payments in a given year.

The 10 most common medical misadventures encountered in the PIAA registry for CV closed claims are listed in

Table 2. These are the primary causes for claims filings for 4,248 CV claims. No specific medical misadventure is present in 892 closed CV medical claims. Table 2 also lists the percentage of paid claims and the average indemnity paid for paid claims for each of the 10 most frequent medical misadventures. For claims in which no identifiable medical misadventures were present, the percentage of paid to closed claims is lowest, at 5%. The average indemnity payment for these claims is significant, however. At \$208,205, the average payment for these claims is higher than the average payments for cases involving delays in the performance of procedures (\$177,413), cases involving procedures performed with no indications or with contraindications (\$194,698), and cases involving medication errors (\$194,560).

Diagnostic error represented the most prevalent identified medical misadventure, and the improper performance of a procedure was the next most prevalent medical misadventure. Failure or delay in referral or consultation represented the least prevalent medical misadventure among the 10 most prevalent. For failure or delay in referral or consultation cases, however, the proportion of paid to closed claims was highest of all medical misadventures (36%). Failure to supervise a case was the medical misadventure with the lowest proportion of paid to closed claims (17%). The highest average indemnity was \$377,193 for failure to perform a procedure, and the lowest average indemnity was \$177,413 for delay in performance of a procedure.

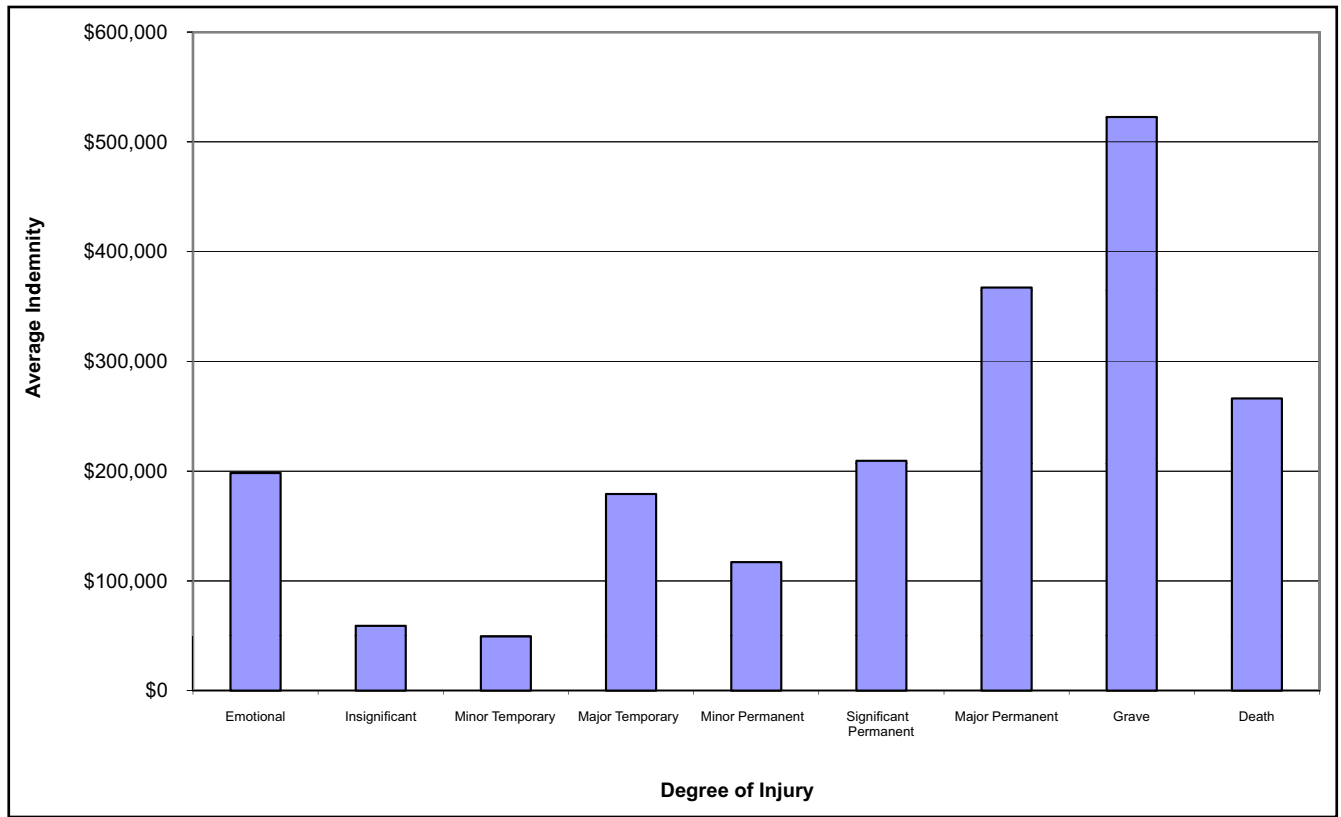


Figure 3. Histogram of degree of injury, measured by the severity index of the National Association of Insurance Commissioners, and the average indemnity paid to plaintiffs in the PIAA-DSP registry, 1985 to 2007.

Of the 878 closed claims that were brought for errors in diagnosis, 24% of claims involved errors in the diagnosis of acute myocardial infarction, coronary atherosclerosis, or chest pain not further specified. Six percent involved errors in the diagnosis of aortic aneurysm, and 3% represented errors in the diagnosis of pulmonary embolism. The percentage of paid to closed claims for myocardial infarction, coronary atherosclerosis, or chest pain was 23%, and the percentage of paid to closed claims for aortic aneurysm was 35%. The percentage of paid to closed claims for pulmonary embolism was 21%.

Of 647 closed claims brought for improper performance of a procedure, 26% involved diagnostic cardiac catheterization, and 16% involved coronary interventional procedures. The percentage of paid to closed claims in diagnostic catheterization and interventional procedures was 24%. The average indemnity for diagnostic procedures was \$183,634, and for interventional procedures, the average indemnity paid was \$302,832. The percentage of paid to closed claims for improper performance of pacemaker insertion or removal resulted in payment was 18% of claims, with an average indemnity of \$63,857.

Medical misadventures involving medication errors represent a relatively small proportion of closed CV claims (8%), and most of these closed claims (27%) were related to disorders of lipid metabolism. Of note, none of these closed claims raised for medication errors for lipid metabolism resulted in payments to the plaintiffs. Other diagnoses related to medication errors included atrial arrhythmias (8%),

acute myocardial infarction (7%), other cardiac arrhythmias (4%), and heart failure (4%). Claims for medication errors for heart failure resulted in payment in 33% of cases.

Table 3 lists the 10 most prevalent CV diagnoses in the PIAA registry. Coronary atherosclerosis (12% of claims) was the most prevalent patient condition, and the next most prevalent condition was acute myocardial infarction (10% of claims). The least prevalent of the 10 common diagnostic conditions was aortic aneurysm, representing 2% of claims; however, this diagnosis resulted in the highest percentage of paid to closed claims (30%). Excluding disorders of lipid metabolism, the diagnostic condition with the lowest ratio of paid to total closed claims (12%) was nonatrial cardiac dysrhythmia, a condition that represented only 3% of closed claims. The diagnosis with the lowest average paid indemnity was heart failure (\$175,474), and the diagnosis with the highest average paid indemnity was aortic aneurysm (\$417,298).

The most prevalent procedure performed among closed CV claims was the diagnostic interview, evaluation, or consultation, accounting for 28% of closed claims, and the next most common procedure was the prescription of medication (12%). Cardiac catheterizations were involved in 12% of closed claims, and coronary angioplasty was involved in 7% of CV closed claims. The least prevalent of common procedures in this series of claims against cardiologists was coronary artery bypass grafting (2%). The ratio of paid to total closed claims was lowest (13%) for patients

Table 5
Most prevalent associated medical issues in cardiovascular closed claims, 1985 to 2007*

Associated Medical Issue	Closed Claims	Paid Claims	% Paid to Closed	Average Indemnity
Communications between providers	165	46	28%	\$267,135
Equipment malfunction	163	18	11%	\$265,071
Premature discharge	101	24	24%	\$287,903
Problem with history or examination	91	29	32%	\$432,111
Lack of adequate facilities	61	14	23%	\$277,768
Unnecessary treatment	49	13	27%	\$244,288
Co-morbid conditions	50	19	38%	\$233,273
X-ray error	31	8	26%	\$290,625
Device malfunction	25	3	12%	\$201,250
Laboratory error	15	2	13%	\$16,225

* Source: PIAA Cardiovascular Risk Management Review, 2008.

Table 6
Most prevalent associated legal issues in cardiovascular closed claims 1985–2007*

Associated Legal Issue	Closed Claims	Paid Claims	% Paid to Closed	Average Indemnity
Informed consent	315	55	17%	\$275,418
Vicarious liability	79	6	8%	\$248,333
Medical records	59	32	54%	\$327,289
Abandonment	40	9	23%	\$100,056
Punitive damages	29	5	17%	\$57,600
Res ipsa loquitur	26	5	19%	\$171,100
Improper conduct by physician	22	2	9%	\$316,667
Breach of confidentiality	20	0	0%	\$0
Assault and battery	15	5	33%	\$659,000
Compliance failure	9	2	22%	\$576,000

* Source: PIAA Cardiovascular Risk Management Review, 2008.

who had only physical examinations, and the highest ratio (30%) was for coronary artery bypass grafting.

Table 4 lists information on the severity of patients' injuries for CV cases in the PIAA-DSP registry. The degree of injury is measured on the severity index of the National Association of Insurance Commissioners.⁵ Slightly more than half (53%) of all claims are associated with the death of the patient. Approximately 10% of patients had major temporary injuries. The ratio of paid to total closed claims is lowest (2%) in patients who had emotional injuries only, and it is highest (30%) in patients with grave injuries. There is a decrement in the payment ratio to 21% for patients who died. Figure 2 presents a graphic display of the relation between the ratio of paid to total closed CV claims and the degree of injury for CV claims in the PIAA-DSP registry.

The average indemnity paid is highest (\$522,614) for patients who have grave injuries and lowest (\$49,346) for those who have minor temporary injuries. The median average indemnity (\$198,250) is paid to patients who have only emotional injuries. Figure 3 presents a graphic display of the average indemnity paid for CV closed claims on the basis of the degrees of injury experienced by the patients.

Table 7
Most prevalent associated professional personnel in cardiovascular claims, 1985 to 2007*

Associated Professional Personnel	Closed Claims	Paid Claims	% Paid to Closed	Average Indemnity
Other physician	1,493	190	13%	\$230,398
Consultant	332	52	16%	\$288,810
Nurse	241	45	19%	\$150,661
Emergency room physician	194	34	18%	\$224,302
Resident or intern	143	29	20%	\$172,883
Manufacturer of drug or equipment	93	0	0%	\$0
Radiologist	87	21	24%	\$256,786
Anesthesiologist	64	12	19%	\$237,659
Technician	56	16	29%	\$141,328
Pharmacist	13	3	23%	\$37,167

* Source: PIAA Cardiovascular Risk Management Review, 2008.

Not uncommonly, professional liability claims contain issues associated with the allegation of provider negligence. These issues are varied in nature, and the 10 most prevalent associated medical issues are listed in Table 5. Faulty communications between providers and equipment malfunction are the most prevalent associated medical issues; each occurs in 4% of closed CV claims. The presence of complicating co-morbid conditions yields the highest ratio of paid to closed claims (38%), and equipment malfunction produces the lowest ratio (11%). The highest average indemnity (\$432,111) is paid for medical issues related to the patient's history or physical examination, and the lowest (\$16,225) is paid for laboratory errors.

CV MPL claims also occasionally contain associated legal issues related to the allegation of negligence. The 10 most prevalent associated legal issues are listed in Table 6. The most common issue is informed consent, and the next most common associated legal issue is vicarious liability. In the PIAA-DSP registry for CV claims, the ratio of paid to closed claims is highest (54%) for problems with medical records and lowest (0%) for allegations of breach of confidentiality. Assault and battery is an infrequent related legal issue; however, this issue carries the highest average indemnity value of \$659,000.

Other medical professionals are frequently named in professional liability claims. Table 7 lists the most prevalent associated professionals associated with CV claims in the PIAA-DSP registry. The most prevalent associated professional personnel are other treating physicians and consultants. Pharmacists are among the least frequently associated medical personnel.

Discussion

It is important to understand the nature and the limitations of the data that populate the PIAA-DSP registry. The information present in this resource is voluntarily provided by a subgroup of the 50 domestic MPL carriers who are members of the PIAA. The data contributors currently number 21 PIAA member companies, but this number and the percentage of contributing member companies have varied over the existence of the DSP. Contributing PIAA members

are given guidelines and definitions to ensure, to the greatest extent possible, that there are consistency and uniformity in the data collection, but invariably in a registry format, there will be uncontrolled factors in the collection and reporting of the data. A second major limitation of the PIAA-DSP registry data is the absence of exposure data. PIAA member companies, for example, do not report the number of cardiologists whom they insure in a given year, so it is not possible to calculate incidence data, nor is it possible to accurately link registry data with external data sources in ways that would allow meaningful calculations of statistical relations. Chiefly because of these limitations, the utility of registry data is to obtain a snapshot of the details of a subject and, using that window in time, to develop hypotheses that may be further tested, preferably in prospective, randomized trials. Unfortunately, no such trials are likely to be initiated to study MPL, so the best available opportunity to gain insight into this subject is now, and probably will continue to be, the study of registry data.

Databases that provide information on large numbers of MPL claims are limited in number and scope. Other than the PIAA-DSP registry, 2 potential sources of data for the study of MPL claims exist. The first is the National Practitioner Data Bank, established by the Health Care Quality Improvement Act of 1986 and administered by the United States Department of Health and Human Services.⁶ The second potential source is a commercial company, Jury Verdict Research (West Palm Beach, Florida), which maintains a database of >245,000 verdicts and settlements for personal injury claims of all kinds.⁷ Jury Verdict Research was established in 1961 with the intent of providing information concerning the results of past personal injury claims for the benefit of plaintiff and defense attorneys and liability insurance companies.

These 2 sources have inherent limitations that decrease their utility in studying MPL. The National Practitioner Data Bank contains data on the amounts of settlements and verdicts for virtually all American MPL claims since its inception. The public-use files from the National Practitioner Data Bank do not have any specific patient diagnoses or practitioner medical specialty information. Thus, they can be of no practical use in studying CV MPL claims. The Jury Verdict Research database does not focus on medical claims, and it does report on settlements and jury awards, so it is heavily biased toward cases that have had outcomes favorable to plaintiffs. The PIAA-DSP registry, although constrained by the limitations noted previously, appears to be the best source of information with which to understand the current state of CV MPL claims. With these caveats in mind, insights pertaining to physician characteristics and claims characteristics may be derived from the PIAA-DSP registry data, and some preliminary hypotheses may be proposed.

Claims against CV medical physicians numbered 4,248 in the PIAA database. These closed claims represent 1.8% of the claims in the entire database. By comparison, American Medical Association information indicates that from 1994 to 2007, self-designated CV medical specialists constituted an average of 2.5% of total physicians in the United States.⁸ Because CV physicians constitute 2.5% of practicing physicians, CV physicians are underrepresented in the

closed claims database, suggesting that CV physicians are less likely to be involved in MPL claims than are other specialists. Furthermore, the 18% paid rate for CV physicians' claims suggests that CV physicians are less likely to lose claims brought against them than are other physician specialists, whose average payment ratio is 30%. The average indemnity paid for CV physicians is, however, larger than the average indemnity paid for other physicians, suggesting that if CV physicians lose MPL actions, they are likely to pay more than are other physicians.

The PIAA database shows that the most prevalent medical misadventure to form the basis of MPL proceedings against CV physicians is "no medical misadventure." These cases represent examples of cases caused by associated medical issues such as equipment malfunction or communication issues between providers or associated legal issues such as informed consent or vicarious liability. An as yet undefined proportion of these cases, however, with no medical misadventures and no associated medical or legal issues may be considered frivolous MPL actions. Characterization of these cases will be the subject of a future report.

The most common medical misadventures encountered by CV physicians in the PIAA-DSP registry are diagnostic errors, improper performance of procedures, and failure to supervise cases.

Of the 9 most common named medical misadventures, 5 can be categorized as errors of omission (failures or delays in some action), and 4 can be categorized as errors of commission. It is of interest to note that CV closed claims that are errors of omission are more likely to be paid claims (26% vs 21%) and are more likely to pay higher indemnities (average \$259,330 vs \$234,108) than are closed claims that are errors of commission.

Not surprisingly, the most prevalent diagnoses in the CV physician closed claims experience are the most common diagnostic categories encountered by practicing cardiologists: coronary atherosclerosis, acute myocardial infarction, cardiac arrhythmias, and heart failure. What is remarkable is that of the 98 closed claims involving the diagnosis of disorders of lipid metabolism, there have been no payments. There is no ready explanation to account for this observation, but a planned closer evaluation of these cases may provide insights.

The diagnosis of aortic aneurysm is particularly interesting in the context of closed CV claims. Aortic aneurysm cases are the 10th most common diagnosis related to closed CV claims, but they have the highest (30%) probability of being paid, and they have by far the highest average indemnity payment, \$417,298, of all diagnoses. The MPL risk for aortic aneurysms is disproportionate to their incidence, and this may be because they are frequently fatal episodes, and often their diagnosis is delayed.⁹

The most prevalent procedures associated with the closed CV claims were diagnostic interview, evaluation, and consultation, occurring in 29% of closed claims. This is consistent with the fact that these services are among those most commonly provided by cardiologists. Cardiac catheterizations were involved in 12% and angioplasty in another 7% of closed claims. The highest average indemnity paid was for angioplasty procedures, at \$348,339. Interest-

ingly, the lowest average indemnity paid was for diagnostic catheterization, at \$177,333.

More than half (53%) of the closed CV claims involved patient deaths. This is to be expected, because MPL claims are often related to poor outcomes. The interesting finding is that death claims in the CV experience were paid only 21% of the time, which is only slightly higher than the overall rate of 18% for CV closed claims and substantially below the 30% rate for the entire PIAA-DSP registry. Thus, the cardiologist prevailed in nearly 80% of the cases involving death of the patient. If 80% of CV closed claims do not involve negligence on the part of the cardiologist, the question becomes, why do survivors bring MPL claims in these circumstances? The answer to this question is not provided by the current data, but one may speculate that there may be communications gaps among CV physicians, patients, and families in these cases. Perhaps unrealistic expectations or a lack of understanding of the limitations of modern cardiology practice may leave bereft families with the belief that negligent care has been rendered.

The data do suggest that there is a rough positive correlation between the average indemnity payment and the severity of injury, as illustrated in Figure 3. The first exception to this trend is for “emotional injury only” cases, which have an average indemnity payment of \$198,250, higher than the average value of \$179,157 paid to claimants with “major temporary injuries.” There are only 4 paid claims among 222 cases in this category; this payment rate of 2% is clearly aberrant. The second exception is the lower average indemnity paid for death cases (\$266,186), and it is reflective of the fact that patients who die do not need compensation for ongoing medical expenses.

Communications problems between providers are the most prevalent associated medical issues for CV closed claims. In addition, the likelihood of payment in cases with this associated issue is relatively high (28%) for CV closed claims, and the average indemnity of \$267,135 is not inconsequential. This, in theory, is an easily remediable risk factor for MPL claims if CV physicians redouble their efforts to communicate with colleagues and to create proper documentation in the medical record.

By far the most prevalent associated legal issue in CV closed claims is informed consent. These claims represent

7% of all CV closed claims, and payment is made in 17% of these cases. The average indemnity for informed consent cases is \$248,333, which approximates the average indemnity for all CV paid claims.

Other treating physicians and consultants are the most prevalent associated professional personnel in CV closed claims. The least frequently associated medical personnel are pharmacists. The ratio of paid to closed claims is highest (29%) when the associated professional is a technician, and the ratio is lowest (0%) when the associated personnel are drug or equipment manufacturers. The highest average indemnity (\$256,786) is paid when radiologists are associated in CV claims, and the lowest average indemnity (\$37,167) is paid when the associated professional is a pharmacist.

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