

Results of the 2015 Perfusionist Salary Study

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Abstract: Presently, there exists no published valid and reliable salary study of clinical perfusionists. The objective of the 2015 Perfusionist Salary Study was to gather verifiable employee information to determine current compensation market rates (salary averages) of clinical perfusionists working in the United States. A salary survey was conducted between April 2015 and March 2016. The survey required perfusionists to answer questions about work volume, scheduling, and employer-paid compensation including benefits. Participants were also required to submit a de-identified pay stub to validate the income they reported. Descriptive statistics were calculated for all survey questions (e.g., percentages, means, and ranges). The study procured 481 responses, of which 287 were validated (i.e., respondents provided income verification that matched reported earnings). Variables that were examined within the validated sample population include job title, type of institution of employ-

ment, education level, years of experience, and geographic region, among others. Additional forms of compensation which may affect base compensation rates were also calculated including benefits, call time, bonuses, and pay for ancillary services (e.g., extracorporeal membrane oxygenation and ventricular assist device). In conclusion, in 2015, the average salary for all perfusionists is \$127,600 with 19 years' experience. This research explores the average salary within subpopulations based on other factors such as position role, employer type, and geography. Information from this study is presented to guide employer compensation programs and suggests the need for further study in consideration of attrition rates and generational changes (i.e., perfusionists reaching retirement age) occurring alongside the present perfusionist staffing shortage affecting many parts of the country. **Keywords:** perfusionist salaries, compensation, economy. *J Extra Corpor Technol. 2016;48:179–87*

The purpose of this study was to measure clinical perfusionists' salaries based on a number of factors to understand the status of perfusionist compensation in the United States. It is envisioned that the summary of data collected may guide employers in development and enhancement of their compensation programs to become better positioned to attract and retain talented clinicians in open heart programs. Currently, there exists a demand for perfusionists to fill needed positions across the country. There are fewer new perfusionist graduates entering the field than the number of professionals exiting, thereby creating a shortage of clinicians (1–3). Duga calculated an estimated shortfall of 200–250 perfusionists per year based primarily on the number of certified perfusionists reaching retirement age over the next several years (3).

In 2015, the total population of certified perfusionists in the United States was 3,984. (5). Many perfusionists began their careers 25 or more years ago when increasing numbers of open heart surgeries created demand for perfusion services. Of these early entrant perfusionists, a significant number are still actively employed. But there is an expected decline in the number of highly experienced perfusionists as the baby boomer generation of perfusionists reaches retirement age, resulting in a staffing shortage. This coincides with the reduction of the number of heart surgeons: a major shortage of heart surgeons was predicted in 2009 to peak in the year 2020 (6).

As employers look to the future, reliance on quantifiable salary data may be helpful to plan compensation programs for hiring experienced perfusionists plus the growing population of new perfusionist graduates entering the field while the more seasoned clinicians exit (i.e., retirement). Based on the available literature in the public domain, there is a lack of comprehensive reliable verified compensation of perfusionists. It is noteworthy, however, that several perfusionist salary studies based on self-reported

Received for publication July 15, 2016; accepted October 4, 2016.
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The senior author has stated that the authors have reported no material, financial, or other relationship with any healthcare-related business or other entity whose products or services are discussed in this paper.

Table 1. Huckaby 2009 salary survey results.

Huckaby 2009 Results	Annual Salary Average
All perfusionists (<i>n</i> = 916)	\$112,458
Facility type	
Hospital based	\$117,986
Surgeon used	\$103,813
Self-used	\$141,298
Position type	
Staff perfusionists	\$104,117
Chief perfusionists	\$125,397
Perfusion company owners/partners	\$145,105
Years until retirement	17.8

income can be found among perfusion-related publications, websites, and discussion boards. They are summarized:

Among perfusionists, an often-cited perfusionist salary survey was authored by Bill Huckaby, RN, CCP, which was based on an online questionnaire of over 900 perfusionists who self-reported their income and benefits in 2009 (7). That study showed the national annual income average for perfusionists to be \$112,458 and is further delineated in Table 1 by 1) employer type, 2) position type, and 3) years' experience (7). Results showed the calculated average number of years until expected retirement was 17.8 (7).

Huckaby also looked at the number of years' experience of perfusionists. He found that salary averages increased as years of experience increase, as shown in Table 1.

More recently, an informal salary survey was led by Alicia Sievert, a certified perfusionist working as an assistant professor and admissions coordinator at Medical University of South Carolina. Although no published academic paper exists of the results of that study, the work is referenced within several online message boards on perfusion population websites (i.e., *circuiturfers.com* and *tridenthealth.com*) (8,9). Table 2 provides the salary averages based on factors of facility and position type.

Another 2013 published study that calculated compensation of the females-only segment of perfusionists was conducted by Brewer and Mongero in 2013. The study

Table 2. Seivert results.

Seivert Results	<i>n</i>	Average Salary (\$)	Average Years of Experience	Average Number of Cases per Year
Facility case type				
Adult only	382	108,335	15	122
Pediatric only	13	116,231	10.7	86
Adult/pediatric	63	112,500	15.5	124
Position type				
Staff perfusionists	265	109,773	15	121
Chief perfusionists	193	130,772	23	112
Part-time only	26	73,500	18	97

comprised 538 female perfusionists, which represented 45% of the total population of all female certified perfusionists in North America (10). The researchers found that, on average, the majority of women in perfusion (roughly 88%) earned above \$75,000 annually, with nearly 8% earning \$150,000 and above (10). Most of the women in the sample population (almost 33%) had over 20 years of experience, and the majority (49%) reported having an undergraduate (bachelor's) degree (10). Brewer and Mongero described participant demographics (such as the percentage of respondents categorized by managerial level, age, and years of experience), but did not differentiate salaries based on these. Income averages were based upon self-reported information provided by survey respondents.

A number of general labor websites that advertise job openings also advertise salary averages based on position titles. For example, *salary.com* and *payscale.com* use similar methodology for arriving at salary ranges. Their formulas rely on self-reports by job seekers. The website *payscale.com*, e.g., collects salary information directly from people in exchange for a summary report(11). Since information is not verifiable, the content about salary averages may be inaccurate as presented. In addition, the United States Bureau of Labor Statistics does not provide analytics of the perfusionist career, specifically (12).

METHODS

Between April 2015 and March 2016, Trident Health Resources, Inc. surveyed clinical perfusionists about their job, benefits, and compensation using a 53-point multiple-choice questionnaire. To qualify for the study, respondents were required to be currently working as a perfusionist for no more than one U.S. employer, and were agreeable to providing a de-identified copy of a recent pay stub or Internal Revenue Services Tax form W-2 to substantiate their reported 2014 gross income. It was necessary that perfusionists also agreed to an informed consent form explaining the purpose of the study and the authors' intention to publicly share summary results. Since the purpose of the study was to provide insight to employers on compensation, it was necessary that self-employed perfusionists be excluded. Part-time perfusionist respondents were separately measured.

Recruitment

Recruitment methods included the use of online announcements of the study at websites and social networks (i.e., Facebook™ pages, Twitter™, field message boards such as Perflist hosted by the American Society of ExtraCorporal Technology (AmSect); *perfusioncommunity.com*, *circuiturfers.com*, *perfusion.com*, and others). Participants

were directed to the study's website, perfusionistresearch.com for instructions and to take the survey using a secure electronic form. Participants were also recruited via postal mail using the CCP mailing list rented from the American Board of Cardiovascular Perfusion (ABCP). Participants were provided additional options to reply by fax, e-mail, or U.S. postal mail. Finally, recruitment came through word-of-mouth referrals at perfusion conferences and through informal contact among perfusionists.

Participant Security and Confidentiality

Anonymity was assured, and survey data was electronically stored in a database on a password-protected secure platform, Amazon S3, which is the same method of data storage used by government agencies(4). Paper surveys that were received in the mail or by fax were electronically entered by the researcher to a secure electronic database and then the originals were destroyed. Supporting documentation was coordinated using third-party validation, as described:

It is recognized that the sponsor of the study, Trident Health Resources, Inc. is a national perfusionist staffing contractor having self-interest in any information gleaned from this study. However, the intention of this work is to contribute to the field of perfusion and share all summary results of the study with the public so that no competitive advantage exists. Further, to overcome any perception of conflict of interest, Trident retained the services of MedPanel, which is a medical research company that served as an independent third party to be in charge of vetting data. Specifically, MedPanel, not Trident, received participants' paystub directly via electronic upload at their website, by e-mail, postal mail, or by fax. Personal information was blacked out by participants before submission so that their identity was hidden and only the dollar figures were visible. The figures were hand matched to the completed surveys (reported income), then annualized/verified by MedPanel. This method was used to determine if each participant's reported salary was supported by the documentation. To ensure anonymity, matching of data from the paystubs to the surveys involved the random assignment of case numbers. MedPanel provided reports to Trident of the validity of each case.

MedPanel also handled the processing of honoraria checks of \$25 each to respondents, reimbursed by Trident. Perfusionist contact information for payment was handled exclusively by MedPanel to ensure that the identity of each participant was not known to Trident.

Statistical Analyses Methods

The results of the study are based on descriptive statistical analysis only (i.e., means, percentages, and ranges) and exclude standard deviation calculations, as is appropriate for compensation studies. Sample population confidence level statistics are enumerated herein, and

in the *Results of the Study* section, it is described how the researchers excluded nonrepresentative subgroups or outliers when summarizing results.

With regard to population size and sample population representation, the researchers calculated the total population of study-eligible perfusionists estimated at 3,785, derived based on an adjusted total of all certified perfusionists in the United States ($n = 3,984$) (1), minus estimates for perfusionists working in a locum tenens capacity, those working for multiple employers, or who are self-employed, plus an adjustment for the standard current unemployment rate (5%, U.S. Bureau of Labor, 2015) (12). To attain a statistically significant sample size, it was the researchers' goal to receive at least 253 validated responses for a 90% confidence level, significant at the $p \leq .05$ level. By the end of March 2016, the study procured 481 responses, of which 287 were validated (i.e., respondents provided income verification that matched reported earnings). At the 90% confidence level, the margin of error for this sample population size is 5.79% points, which is statistically representative of the whole perfusionist population nationally. However, the percentage of survey responses that did not include income documentation was high (67%) and for this reason, the usable sample size was significantly reduced for an overall 7.6% net response rate.

RESULTS

The objective of the 2015 Perfusionist Salary Study was to gather information to determine current compensation market rates (averages) of clinical perfusionists working in the United States. The profile of the study's participants is described in this section, along with an analysis of compensation for the factors of gender, age, education level, geography, job classification, years of experience, etc. In all calculations, the researchers excluded statistical outliers when calculating salary means, (e.g., unusually high or low pay reported by a very small number of perfusionists) to avoid skewing the results. For example, in two surveys submitted, bonus amounts exceeded 100% of net compensation. Hence, if included in results, these outliers would have artificially inflated the averages.

PERFUSIONIST RESPONDENT PROFILE

Certification Status

One hundred percent of respondents reported they are certified by the ABCP. Twenty-one percent (21%; $n = 59$) of perfusionists reported holding one or more state licenses.

Employment Status

The 2015 Perfusionist Salary Study received 287 responses and of those, over 95% work full-time ($n = 275$) with a small subpopulation of perfusionists working part-time ($n = 12$). Researchers of this study make distinction between these groups, with compensation discussion relevant to the full-time career perfusionist cohort, exclusively. That is, due to the limitation of the study the number of hours worked and paid for per part-time employee is not known. Wherein appropriate, part-time perfusionist descriptive statistics are included in the analyses.

The majority of full-time perfusionists fill a position role as a staff perfusionist (63.3%), with 33.8% established as chief perfusionists, and 3% report that they serve in as company owner/perfusionist capacity. Part-timers in the study comprise 75% staff perfusionists, 8% chiefs/managers, and 17% company owners. The average length of time used by the present employer was 11 years for all full-time perfusionists and 8 years for those working part-time. Perfusionists drive an average of 14 miles to their work location.

Workload and Ancillary Perfusion Services

Perfusionists working full-time reported spending an average of 35 hours per week productively (not on call). The average number of days on call is 13 per month. In 2014, perfusionists reported performing an average annual total of cardiopulmonary bypass on-pump cases of 108, and an average of 13 cases within the past month of the time they took the survey. For autotransfusion cases, perfusionists reported an annual average of 56 cases, with the past 30 days having an average of seven cases.

Among full-time perfusionists sampled, 5% work exclusively pediatric cases, 8% work both adult and pediatric cases, and 87% provide perfusion services to adults only.

Few perfusionists' work includes transplant cases (24%). The majority (77%) of full-time perfusionists reported that they provide extracorporeal membrane oxygenation (ECMO) services. Of these, 26% receive additional compensation with more than a third of those (36%) being paid per 12-hour shifts and most (64%) being paid per 8-hour shifts. Average compensation for additional ECMO services could not be calculated due to a high number of reporting errors in response to the survey question, "What is the Amount Received per extra ECMO?" Perfusionists provided a mix of annualized dollar amounts and shift amounts and an average could not be determined.

The majority of perfusionists (79%) reported that they manage ventricular assist devices (VAD). Of those, only 10% receive additional compensation, usually paid based on 8-hour shifts (68%) vs. 12-hour shifts. Average compensation for additional VAD services could not be calculated due to a high number of reporting errors in response to the survey question, "What is the Amount Received

Table 3. Benefits provided by employers.

Employer Provided Benefits	<i>n</i>	Percentage
Major medical	271	99
Vision	246	89
Dental	258	94
Life insurance	247	90
Short-term disability	223	81
Long-term disability	219	80
Licensing/certification fees	176	64
Malpractice insurance	251	91
Retirement/401k	267	97
Paid time off	267	97
Continuing education	239	87

per extra VAD?" Perfusionists provided a mix of annualized dollar amounts and shift amounts and an average could not be determined.

Total Compensation Overview

Total compensation, by definition, typically includes salary and bonuses and usually a benefits package to employees that may consist of health insurance, performance bonuses, vision and dental insurance, and retirement plans, for example (13). Each benefit has a cost to the company and a monetary value to the employee. The 2015 Perfusionist Salary Study measured total base compensation (annual salary and bonus only) in its calculations. However, perfusionists were also asked about additional benefits they receive. A descriptive summary of the benefits reported by perfusionists as received are shown Table 3.

Beginning with a generalized scope of the perfusionist career, Table 4 shows the overall salary average for all full-time perfusionists and the highest and lowest ranges. By comparison, the average total compensation for all perfusionists is 13% higher than the 2009 national average of \$112,458(7).

Gender

In 2015, the perfusion field remained male dominated (Table 5). A trend may be indicated with the gap closing. Of all survey respondents, younger perfusionists (age 34 and under) who have entered the field full-time within the past 5 years ($n = 69$) are represented males to females with a ratio of 13:10 (59% male).

Table 4. Salaries of all perfusionists nationally.

Total compensation	\$127,600
Low	\$50,000
High	\$295,000
Average bonus among those who received bonuses ($n = 127$)	\$5,600
Average bonus among all	\$2,600
Average years' experience	19

Table 5. Salaries by gender/position level.

Average Compensation by Gender	Male	Female
All perfusionists (n)	181	91
Total compensation	\$130,800	\$121,000
Low	\$75,000	\$50,000
High	\$295,000	\$245,000
Received bonus (n)	88	39
Average bonus among those who received bonuses	\$6,600	\$3,200
Average bonus among all perfusionists	\$3,200	\$1,400
Average years' experience	20	17
Staff perfusionists (n)	109	64
Total compensation	\$120,800	\$121,500
Low	\$75,000	\$75,000
High	\$230,000	\$246,000
Received bonus (n)	47	23
Average bonus among those who received bonuses	\$4,800	\$3,700
Average bonus among all staff perfusionists	\$2,100	\$1,300
Average years' experience	17	16
Chief perfusionists (n)	65	26
Total compensation	\$144,700	\$119,000
Low	\$99,400	\$72,000
High	\$273,500	\$185,000
Received bonus	38	15
Average bonus among those who received bonuses	\$9,000	\$5,300
Average bonus among all chief perfusionists	\$1,400	\$2,400
Average years' experience	25	24
Company owners (n)	7	1
Total compensation	*	*
Low	*	*
High	*	*
Received bonus	*	*
Average bonus among those who received bonuses	*	*
Average bonus among all company owners	*	*
Average years' experience	*	*

*Nonrepresentative sample size.

As Table 5 shows, gender differences in perfusionist remuneration do exist. Total compensation for all perfusionists in the study shows total compensation is 8% less for women than men, overall. It is noteworthy, however, that the difference is not seen at the “staff perfusionist” career level. Rather, gender disparity is observed within the chief perfusionist/manager level of work, whereby males earn 22% more than women and whose bonuses represent 121% over their female counterparts. As such,

Table 6. Full-time perfusionists by age.

Age	Total (n)	Male (n)	Female (n)
25-34	69	39	30
35-44	61	36	25
45-54	64	49	15
55+	81	60	21

Table 7. Expected number of years until perfusionists retire.

Perfusionists' Expected Retirement Timeframe (Year)	n	Percentage
1-4	36	13
5-10	65	24
11-15	42	15
16-20	26	9
21-25	28	10
More than 25	64	23

the size of the difference impacts the overall gender comparison. These differences coincide with the national statistic about gender wage gap. In 2015, female full-time workers made only 79 cents for every dollar earned by men, a gender wage gap of 21%(14).

Age and Retirement

Table 6 shows the spread of ages among the sample population, with a predominance of perfusionists falling into the age category of over the age of 55, particularly for males. Similarly, among the subpopulation of part-time perfusionists, 75% are age 55 or above. The largest cohort of females for all perfusionists is in the youngest age group, under 34.

The 2015 Perfusionist Salary Study collected data from perfusionists about their intended time to retire. The results are shown in Table 7 and Figure 1 and would indicate that the next decade will require employers to replace staff with greater frequency due to this attrition. Of the 261 responding to this question, 39% indicated that they will be retiring within the next decade. Further studies may benefit the perfusion profession to explore if staffing levels are sustainable by support of new entrants to the field in future years. Additional factors affecting staffing would be the projection of current adult and pediatric cardiac and ECMO volumes within the next decade. On-broad terms, the potential impact of attrition due to retirement lies not only upon the perfusion

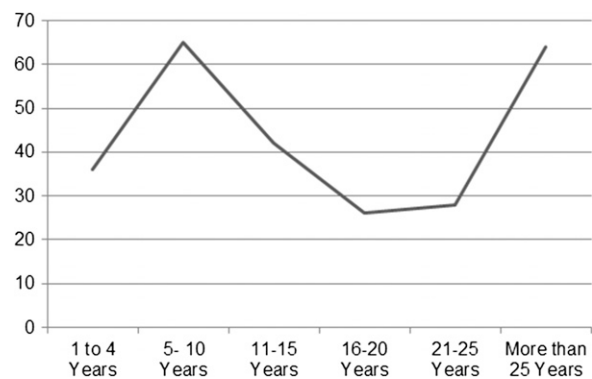


Figure 1. Expected number of years until retirement graph.

Table 8. Education level of perfusionists.

Education Level	<i>n</i>	Average Total Compensation (\$)	Low (\$)	High (\$)	Received Bonus (<i>n</i>)	Average Bonus Among Those Who Received Bonuses (\$)	Average Bonus Among All (\$)
Bachelors	133	131,800	81,300	295,000	63	4,900	2,300
Masters	78	120,000	72,000	230,000	32	7,000	2,900
Accredited perfusion education	52	128,000	50,000	273,000	28	5,100	2,700
Doctorate	4	136,600	116,000	152,500	2	6,200	3,100
High school	5	148,100	122,000	205,000	2	11,750	4,700

profession but potentially to other therapies that require extracorporeal technology. This shortage implores further research to project the number of additional certified perfusionists that will need to be trained and used in the United States.

Family Life

The majority of perfusionists are married (78.5%) and most have dependent children (57%). All part-time perfusionists (100%) in the study reported that they are married.

Education Level

Table 8 delineates the reported educational background of full-time perfusionists, with the majority of perfusionists indicating that they have a bachelor's degree (48%). Salaries do not necessarily reflect an upward trend based on higher levels of education, suggestive that additional research on the impact of education may be worthwhile in consideration of changes in the industry over time. Most perfusionist jobs require a formal education, however, it should be noted that there were no formal perfusionist education or training programs until the early 1970s (15), which explains the small percentage of "high school" responses. Before 1972, all perfusionists were trained on the job and later accepted to the board under "grandfathering," which was defined as a candidate who had 2 years of clinical experience in cardiovascular per-

fusion and who had conducted 100 clinical perfusion cases as of July 19, 1972 (15).

Although the present study shows a subpopulation of perfusionists with advanced degrees, additional studies would be needed to document the degree to which an advanced academic degree correlates with compensation. Another area of consideration about education's impact on salary is the return on investment value of educational costs to the perfusionists' career. No known studies explore if graduate level education results in higher compensation and/or higher pass rates on the ABCP examination for certification.

Years of Experience

Table 9 shows the averages in salary and bonuses based on perfusionists' years of experience. In Figure 2, the graph delineates the overall upward trend in the total average compensation based on increasing years of experience. It is observed that, salaries "top out" after 20 years of clinical experience.

Geographic Profile

Perfusionist employer locations comprise 43 states. Seventeen respondents indicated that they work in more than one facility covering multiple states under one employer/salary source. In cases whereby perfusionists work across multiple states, respondent salaries were averaged in each of the states where they worked. No survey

Table 9. Perfusionists' years of experience.

Perfusionists' Experience					
Perfusion Experience (Years)	<i>n</i>	Received Bonus (<i>n</i>)	Average Bonus Among Those Who Received Bonuses (\$)	Average Bonus Among All (\$)	Average Total Compensation (\$)
0-4	35	13	4,300	1,600	98,000
5-9	37	18	7,600	3,700	117,500
10-14	34	16	5,100	2,000	122,300
15-19	39	23	3,400	2,000	130,100
20-24	36	17	6,900	3,200	139,100
25-29	32	12	8,100	3,100	140,400
30-34	32	15	6,300	2,600	135,800
35+	30	15	4,300	2,200	141,100

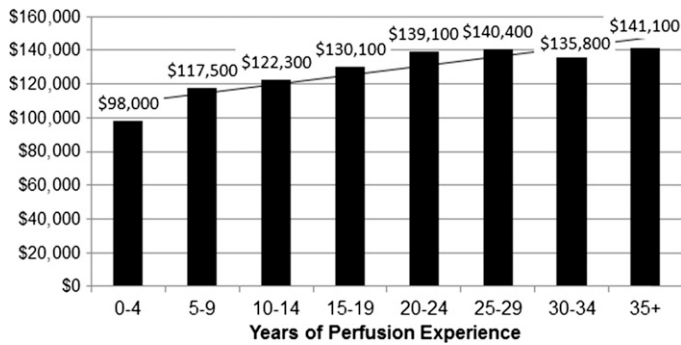


Figure 2. Perfusionists' years of experience trend.

Table 10. States and regions of perfusionist employers.

Perfusionists by Region							
Midwest Region		Northeast Region		South Region		West Region	
State	<i>n</i>	State	<i>n</i>	State	<i>n</i>	State	<i>n</i>
IA	5	CT	1	AL	3	AK	2
IL	11	MA	7	AR	2	AZ	4
IN	13	ME	0	DC	1	CA	21
KS	6	NH	0	DE	1	CO	6
MI	16	NJ	4	FL	24	HI	0
MN	1	NY	11	GA	12	ID	2
MO	12	PA	14	KY	2	MT	0
ND	0	RI	0	LA	5	NM	2
NE	6	VT	0	MD	5	NV	5
OH	19			MS	2	OR	6
SD	0			NC	6	UT	5
WI	14			OK	3	WA	10
				SC	7	WY	0
				TN	6		
				TX	15		
				VA	8		
				WV	3		

responses were received from perfusionists in the states of Maine, Montana, New Hampshire, North Dakota, South Dakota, and Wyoming. Due to the sample population's state diversity spread across the nation resulting in small subpopulation sizes, the researchers assigned states to regions for appropriate geographical analysis. The regions used in this study coincide with the same regions used in data analysis by the U.S. Census Bureau (16). Table 10 shows the distribution of full-time perfusionist survey responses by states of employer.

Table 11 provides the salary averages by assigned geographic region. The Northeast region has the highest average total compensation, which is more than 20% higher than each of the other regions. Bonus compensation averages are highest in the West. Salaries are lowest in the South.

Position Classification

Table 12 summarizes the average salaries and bonuses for each full-time position classification: 1) staff perfusionist and 2) chief perfusionist/manager (company owner/perfusionist). An expanded view of Table 12 is explored with regard to gender (Table 5).

Employer Type

Perfusionists were asked to describe their employer type among seven choices, 1) physician group, 2) hospital—government/veterans, 3) perfusion staffing company, 4) perfusion group, 5) hospital—university/teaching, 6) hospital, and 7) children's hospital. Table 13 shows the breakdown of responses and salary averages. The highest paying entity is children's hospitals, which has an average total compensation that is 32% higher than the calculated national average. Physician groups are the lowest paying employer type.

DISCUSSION

The 2015 Perfusionist Salary Study is the first national survey that is based on verified salary data across multiple types of employers, from hospitals to small businesses

Table 11. Region of perfusionists' employment.

Perfusionists' Salary By Region							
Region	<i>n</i>	Received Bonus (<i>n</i>)	Average Total Compensation (\$)*	Low (\$)	High (\$)	Average Bonus Among Those Who Received Bonuses (\$)	Average Bonus Among All (\$)
South	101	53	123,400	75,000	295,000	4,900	2,600
West	62	30	127,000	75,000	227,000	7,800	3,800
Midwest	85	43	124,400	50,000	228,000	5,400	2,700
Northeast	33	8	154,500	83,000	273,500	6,300	1,500

*Salaries of perfusionists working in multiple states are calculated in all corresponding regions.

Table 12. Perfusionists' position classification.

Perfusionists' Salary by Job Classification							
Classification	<i>n</i>	Received Bonus (<i>n</i>)	Average Total Compensation (\$)	Low (\$)	High (\$)	Average Bonus Among Those Who Received Bonuses (\$)	Average Bonus Among All (\$)
Staff perfusionist	173	70	120,300	50,000	245,000	3,300	5,400
Chief perfusionist manager	91	53	137,400	72,000	273,500	7,100	4,100
Company owner perfusionist	8	4	172,300	103,000	295,000	6,700	2,900

operating as staffing providers. The researchers learned a great deal during the undertaking of the study and offer several areas where improvements and expansion would be beneficial in the future of perfusion.

Limitations of the Study, and Recommendations for Further Study

Timeliness of Data: There was initial participant resistance to the salary study, which resulted in a lengthy data collection period. Researchers received feedback at several regional perfusion meetings that perfusionists did not feel comfortable sharing information on pay checks and they questioned how the information would be used. The researchers addressed this by arranging for evidence de-identification (allowing blackening out of perfusionists' and employer names on pay stubs before submission), and by providing third party (e.g., MedPanel) handling of confidential salary information. The researchers also disclosed their intention to publish results to the public. Although these limitations were overcome and the study attracted a valid sample size, the time to attain the needed number of survey responses was 1 year. In a changing demography, such a long period may mean that salaries from the year 2014 may already be outdated at time of publishing in 2016.

The perfusion profession is a small specialty clinical field and any changes in the demography of the population can reveal a trend, having far-reaching effects, as is the case in

the current staffing shortage due to the attrition of retiring professionals, for example. Salary surveys that are repeated at regular intervals (every 1 and 2 years, for example) may assist employers to identify changes in the field to prepare them for future human resources needed. It is, therefore, recommended that future studies be made to add to this published work.

Compensation Not Calculated: This study failed to capture and measure new employee sign-on bonuses. This would be an area for further research. In addition, two questions on the salary study were misunderstood by participants as to the total VAD and ECMO additional compensation per procedure, thereby no compensation was measured for these important and growing areas/procedures in the field of perfusion.

Exclusion of Other Perfusionist Subpopulations: This study excluded independent perfusionists (self-employed), traveling perfusionists working for multiple employers, and locum tenens staff. Part-time perfusionists' salaries could not be calculated without additional clarifying information. Also, it was a limitation of the study that salary averages were not calculated by state due to small sample size. Further studies on these subpopulations would add to the existing work.

Further, this study revealed disparity in pay for female chief perfusionists. The researchers also recommend

Table 13. Perfusionists' employer type.

Perfusionist Salaries by Employer Type							
Employer Type	<i>n</i>	Received Bonus (<i>n</i>)	Average Total Compensation (\$)	Low (\$)	High (\$)	Average Bonus Among Those Who Received Bonuses (\$)	Average Bonus (\$)
Physician group	18	N/A	108,500	72,000	155,000	3,200	2,700
Hospital—Gov't, VA	7	N/A	112,900	82,200	129,000	3,100	4,300
Perfusion staffing company	47	47	114,700	50,000	205,000	5,800	3,800
Perfusion group	58	58	118,229	80,000	295,000	6,300	3,400
Hospital—university teaching	27	N/A	127,400	75,000	185,000	4,400	1,800
Hospital	102	102	138,200	83,000	271,000	6,100	1,700
Hospital—children	13	N/A	169,500	80,300	273,500	8,900	3,400

future studies be conducted to explore the effect of gender on perfusionists' compensation and the added value of advanced education as it relates to career advancement and salaries.

The Job Market and Outlook for Perfusionists: This study did not expound on the current job outlook for perfusionists in terms of number of job vacancies and/or hiring trends of employers. This is an area for further research which may provide a scope of the employment landscape that can shed light on starting salaries and frequency of job changes (turnover) of perfusionists.

The state of the educational programs for perfusionists is yet another area of study due to the fact that the number of graduating perfusionists to fill jobs can predict the years of shortfalls and the need for employers to adjust compensation rates to be competitive.

Perfusionist Satisfaction: Finally, the psychosocial aspects about compensation may be important to the future of perfusion. Qualitative studies may give insight into the driving forces that motivate perfusionists to enter and/or continue in their line of work. Surveys that measure satisfaction may glean the working conditions that employers could refine to attract new talent. The area of employee satisfaction is a recommended area of further research.

CONCLUSIONS

Perfusionists provide specialized clinical services in health care and are essential to the delivery of patient care to patients nationally. This study provided a descriptive statistical summary of salary data for a sample population of all perfusionists. Given that the average 2015 salary is \$127,600 with 19 years of experience, this average changes when data are narrowed in scope under sub-population analysis. The researchers found that salaries are notably higher or lower depending on perfusionist's geographic region, type of facility where they work, what their position classification is, and the number years of experience. It is noteworthy that the research did not conclude significant salary differences based on education level. Also of note is the gender disparity found specifically for perfusionists in the chief perfusionist role, with women earning significantly lower salaries.

Given the limited descriptive analyses of salary factors within this study, the researchers advocate the need for current salary information to guide the profession and attract new entrants to the profession and have identified numerous areas for future study.

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