

---

# Surveying the Research Interests, Needs and Productivity of Perfusion Educators

---

Denise E. Bennett and Philip D. Beckley

Circulation Technology Division  
School of Allied Medical Professions  
College of Medicine  
The Ohio State University  
Columbus, OH

**Keywords:** perfusion, research; perfusion, survey; perfusion, training; survey, perfusion

## Abstract

---

**(J. Extra-Corpor. Technol. 19[3] p. 384–391 Fall 1987, 5 ref.) The continuing advances in perfusion have brought an increased need for research to validate professional roles and practices. Perfusion educators are faced with increased expectations that they will conduct this research even though many feel they do not have the background or support to do so.**

In an effort to address these concerns, a national study was done to determine the research interests, needs, skills, and productivity of educators in the field of perfusion. The goal of the study was 1) to determine the level of involvement in research activities of perfusion faculty; 2) to identify research interests of these educators; 3) to characterize the current research environment; 4) to determine the research background of perfusion educators; and 5) to identify continuing education needs for research productivity.

Twenty-seven perfusion education programs were contacted for lists of their current faculty members. A survey questionnaire was mailed to the 63 names received. Completed surveys were received from 26 individuals (41%). The overall results of the survey indicate low research productivity, a lack of research skills and support for research, and a need for workshops dealing with the development of research skills.

---

Direct communications to: Denise E. Bennett, Cardiovascular Perfusion Department, Children's Hospital, 700 Children's Drive, Columbus, OH 43205

## Introduction

---

With the continued expansion and growth of allied health professions, there is an increased need for research to validate the new areas and to enhance the established areas. Educators are traditionally looked to for much of this research and their productivity is used by others to assess competency of their professions. Allied health educators have been viewed as not being as productive as those in other academic areas. Reasons for this discrepancy may be that allied health professionals are more clinically-oriented than research-oriented, often lack needed research skills, and are professionally rewarded by other means.<sup>1</sup>

As members of a newer allied health profession, perfusionists are still struggling to establish their credentials with more established allied health professions as well as with the rest of academia. In an effort to establish the research background, productivity, and needs of perfusion and other allied health professions, a survey questionnaire was designed. The questionnaires were sent to faculty of perfusion programs accredited by the Committee on Allied Health Education and Accreditation (CAHEA) as well as to faculty from 8 additional allied health programs. The objectives of this study were 1) to determine demographic characteristics of allied health faculty; 2) to determine the current level of involvement in research activities of the faculty; 3) to identify research interests and continuing education needs of these educators; and 4) to characterize the current research environment.

## Materials and Methods

---

The survey questionnaire was jointly designed by faculty members from medical dietetics, medical rec-

ord administration, medical technology, nurse anesthesia, occupational therapy, perfusion, physical therapy, radiologic technology, and respiratory therapy as part of a collaborative research program. This questionnaire was adapted from a survey for clinical dietitians developed by M. Rosita Schiller, Ph.D., R.D. The survey instrument consisted of four major sections. The first section requested demographics such as level of education, academic rank, formal research background, type of sponsoring institution, and level of students taught. In the second section, on current involvement in research activities, questions concerned time spent on research, type of research performed, number of projects, grants, publications and presentations, during the years 1980 to 1985. The third section identified areas of research interests and needs. Allied health faculty assessed their research skills, interest in collaborative research and types of continuing education. In the final section the survey respondents characterized the research environment at their institution by rating factors that help promote research activity.

Letters were sent to the directors of 2,034 Allied Health programs in medical dietetics, medical record administration and technology, medical technology, nurse anesthesia, occupational therapy, perfusion, physical therapy, radiologic technology and respiratory therapy. The 27 perfusion programs accredited at that time by CAHEA were contacted. This initial letter requested the names of all regular, salaried faculty so the surveys could be sent directly to each faculty member. Of the 2,034 programs contacted, 1,131 (56%) responded listing 4,860 faculty. Surveys were mailed to all 4,860 educators with 1,969 (41%) surveys returned. Fifteen of the perfusion programs contacted responded with names of 63 faculty members. Twenty-six perfusion faculty (41%) returned completed surveys. Due to time and economic constraints, follow-up letters were sent only to medical records administration and technology programs.

## Results

### *Demographics*

Tables 1 and 2 characterize the survey respondents' demographics and research backgrounds. The majority of perfusion faculty have a Bachelor of Science degree but only 3 respondents have a Masters degree and only one has completed a Ph.D. Sixty-nine percent of all allied health faculty have completed at least a Masters degree as compared to 19.1% of perfusion faculty. The type of sponsoring institution varies markedly with perfusion, having a much higher percentage of hospital based programs than all allied health does. In over half the cases tenure does not apply to

perfusion faculty, as opposed to 41% for all allied health faculty. The average number of years as a faculty member in perfusion programs is 4.5 years, while the mean for all allied health faculty is 7.9 years. Most of the perfusion and the rest of allied health faculty teach baccalaureate level students.

Differences exist between the preparation for research by the perfusion faculty versus that of the general allied health faculty. Over half of the respondents from perfusion programs indicated statistics and research methods courses at the undergraduate level but only a few indicated graduate level courses in these areas. For the allied health faculty, less than half have had undergraduate courses but over half have had graduate level courses in statistics and research methods. Most perfusion faculty had participated in some type of undergraduate research project but again only a few have completed a formal masters thesis or doctoral dissertation. Fewer allied health faculty completed undergraduate research projects but a greater percentage have completed upper level research.

### *Involvement in Research Activities*

About 32% of the respondents from perfusion programs spend zero hours per week on research while 36% spend 1-4 hours, 20% spend 5-8 hours, and 12% spend over 8 hours per week. The average time spent per week for both perfusion and allied health faculty is 4 hours. A vast majority (72% for perfusion, 76% for allied health) would prefer to spend more time in research (Table 3).

The survey respondents were asked about their participation in research projects since 1980. Over 30% of perfusion faculty and 46% of allied health faculty had never participated as the primary investigator, while 13% of perfusion and 44% of allied health faculty had never participated as a coinvestigator. About 49% of all respondents had never submitted a research proposal (Table 4).

Clinical studies were overwhelmingly the most popular type of research performed by perfusion faculty while allied health faculty preferred clinical and survey studies. The vast majority of survey participants collaborate with fellow perfusionists at their institution, while about one third collaborate with other professionals at their institution. Few respondents collaborate with those outside their institution (Table 5).

The survey participants were asked about the number of presentations they had made at national, regional, or state meetings in the past five years. Two thirds had never presented at a symposium or major session (non-research) and 56% of perfusion and 74% of allied health faculty had never presented a major research paper. About 47% of perfusion faculty and 69% of allied health faculty never published a research article as a primary

**Table 1**  
**Demographic Characteristics**  
**PERFUSION**

<b>Item</b>	<b>Frequency</b>	<b>Valid Percent</b>	<b>ALLIED HEALTH Valid Percent</b>
<b>Highest Level of Education</b>			
Certificate	1	3.8%	2.1
Associate	0	0	2.9
Bachelor of Science	12	46.2	13.6
Masters Degree in Progress	7	26.9	11.1
Masters Degree Completed	3	11.5	37.1
Doctorate in Progress	1	3.8	13.3
Doctorate Completed	1	3.8	19.1
<b>Academic Rank</b>			
Instructor	20	76.9	34.9
Assistant Professor	4	15.4	30.9
Associate Professor	1	3.8	16.9
Professor	0	0	6.9
Other	1	3.8	10.5
<b>Type of Institution</b>			
<b>Hospital-based</b>			
Certificate Program	8	32	12.3
<b>2 year Community/ Technical College</b>			
4 year Liberal Arts College	1	4	17.2
4 year Professional College	4	16	18.0
<b>4 year Major Research University</b>			
University	8	32	31.8
<b>Tenure Status</b>			
Tenured	4	16	29.7
Nontenured, but pursuing tenure	6	24	28.3
Tenure does not apply	15	60	41.9
<b>Years in Faculty Position</b>			
0-3 years	11	42.3	26.5
4-7 years	12	46.2	29.3
Over 7 years	3	11.5	44.2
<b>Level of Students Taught</b>			
Associate	6	24	32.7
Certificate	8	32	18.6
Baccalaureate	21	84	62.3
Graduate	7	28	29.2
Other	2	8	4.0

author and 42% of perfusion faculty and 72% of allied health faculty never published a research article as a coauthor. However, close to one fourth of the respondents from perfusion programs had published four or more research articles in the past five years while less than 10% of all allied health faculty had. About one fourth of both perfusion and allied health faculty have published at least one nonresearch article (Tables 6 and 7).

#### *Research Interests and Needs*

Three-fourths of the perfusion and allied health respondents were interested in collaborative research of some type. About 44% of the perfusion respondents and 54% of the allied health respondents felt they had the interest and skills to serve at the level of a primary investigator in collaborative research while the majority would be willing to participate as a coinvestigator (Table 8).

**Table 2**  
**Research Background**  
**PERFUSION**

Item	Frequency	PERFUSION	ALLIED HEALTH
		Valid Percent	Valid Percent
<b>Preparation for Research</b>			
<b>Undergraduate Curriculum</b>			
Statistics course(s)	14	60.9	48.9
Research methods course(s)	15	65.2	27.5
<b>Graduate curriculum</b>			
Statistics course(s)	7	30.4	60.2
Research methods course(s)	2	8.7	62.2
Other	4	17.4	7.5
<b>Research Experience</b>			
Undergraduate research project	18	72	42.0
Masters thesis	2	8	34.5
Masters project (nonthesis)	2	8	30.0
Internship research project	3	12	10.0
Doctoral dissertation	2	8	24.1
Other research experience	4	16	8.8
No research experience	1	4	11.3

**Table 3**  
**Time Allocation for Research**  
**PERFUSION**

Item	Frequency	PERFUSION	ALLIED HEALTH
		Valid Percent	Valid Percent
<b>Time Devoted to Research per Week</b>			
0 hours	8	32	38.1
1-4 hours	9	36	31.4
5-8 hours	5	20	15.9
> 8 hours	3	12	14.6
<b>Preference for Research</b>			
Spend less time in research	0	0	2.3
Spend more time in research	18	72	76.0
Keep research time the same	7	28	20.9

Table 9 presents the research skills needed by the respondents. Over three-fourths of both perfusion and allied health respondents felt they needed help in getting funded. Over 40% of the perfusion faculty and over 50% of the allied health faculty felt they needed to acquire skills in statistical analysis of data and in getting papers published. The most preferred mode of obtaining some of these research skills was to hold workshops at professional meetings (Table 10).

Each survey participant was asked to rate various aspects of their current research environment on a

scale of 1 to 7 (Table 11). The respondents indicated widely varying types of environments. Personal interest in research and availability of statistical services rated highly among perfusion faculty while support for and priority of research rated much lower for both perfusion and allied health. The allied health faculty indicated fewer professional and statistical services available than perfusion faculty, while perfusion faculty indicated less importance of research for promotion and a greater ambiguity in roles of research versus service versus teaching than allied health faculty.

**Table 4**

**Research Involvement Since 1980**

Item	None	1	2	3	4 or more
Participation in Research Project as (Valid Percent):					
Primary Investigator					
Perfusion	30.4	30.4	21.7	4.3	12.9
Allied Health	46.2	20.7	12.8	7.6	12.7
Coinvestigator					
Perfusion	13	8.7	13	21.7	43.3
Allied Health	44.5	19	14.8	7.7	14.0
Number of Research Proposals Written as (Valid Percent):					
Primary Investigator					
Perfusion	40	28	20	4	8
Allied Health	49.3	21.2	11.0	5.9	12.5
Coinvestigator					
Perfusion	56	8	8	8	20
Allied Health	63.2	15.6	8.5	5.6	7.0
Research Projects Approved with Funding as (Valid Percent):					
Primary Investigator					
Perfusion	61.9	19	14.3	4.8	0
Allied Health	70.9	14.3	7.5	3.1	4.1
Coinvestigator					
Perfusion	66.7	0	9.5	9.5	14.3
Allied Health	79.9	11.6	5.0	1.9	1.6
Research Projects Approved without Funding as (Valid Percent):					
Primary Investigator					
Perfusion	66.7	19	0	4.8	9.6
Allied Health	73.3	15.8	6.1	2.2	2.6
Coinvestigator					
Perfusion	85.7	0	4.8	4.8	4.8
Allied Health	81.1	9.8	4.0	1.6	3.5

**Discussion**

The response rate on the surveys for perfusion as well as allied health faculty was a disappointing 41%. The resulting population for perfusion was very small (N = 26). Faculty with the greatest interest in research were most likely the ones who completed the surveys; therefore, the results of the survey are probably skewed in favor of research. Considering this group of professionals, the research productivity seemed low. Few of the respondents from perfusion programs seemed to have the formal background and tools necessary to conduct research. Only 1 respondent had a Ph.D. and only 3 others had masters degrees. Allied health respondents, however, appeared to be slightly better prepared since greater than 50% had a Masters degree or Ph.D. This may be important since there appears to be a link between research productivity and degree earned. Both perfusion and allied health respondents indicated a very high percentage (48% and 32%,

respectively) of hospital-based and two year community/technical college programs. These institutions traditionally do not place importance on research productivity. Tenure did not apply to 60% of the perfusion respondents and 42% of the allied health respondents. Studies have shown the importance of scholarly pursuits at many institutions for promotion and tenure.<sup>2,3</sup> The goal of tenure, then, is often a strong motivational force for research productivity.

The majority of all respondents have been involved in some form of research. For perfusion, about 70% had been primary investigator (PI) in at least one research project in the last five years and 87% had been coinvestigators (CI) (slightly lower percentages for allied health), yet about 68% of all faculty spend 4 hours or fewer per week in research. These results appear inconsistent but in one study Blackburn<sup>4</sup> indicated that a small number of faculty members publish 90% of the journal articles. Although the majority of respondents had been involved in research projects,

**Table 5**  
**Research Associations and Areas of Investigation**

Item	PERFUSION		ALLIED HEALTH
	Frequency	Percent	Percent
Type of Research			
Clinical Studies	21	84	45.1
Experimental Studies	14	56	31.0
Survey Studies	8	32	44.0
Education Studies	8	32	37.7
Historical Studies	5	20	11.0
Quasi-experimental Studies	2	8	15.1
Other	1	4	6.7
Type of Research Associations			
Colleagues in your discipline at your institution	20	83.3	56.1
Colleagues in your discipline at another institution	4	16.7	23.0
Colleagues not in your discipline at your institution	8	33.3	26.7
Colleagues not in your discipline at another institution	3	12.5	11.0
No one	2	8.3	21.3

**Table 6**  
**Presentations**

Item	None	1	2-3	4 or more
<b>Number of Presentations (Percent)</b>				
Major Session				
Perfusion	68	8	8	16
Allied Health	62.4	12.4	13.2	12.1
Research Paper				
Perfusion	56	16	16	12
Allied Health	74.1	9.0	9.4	7.5
Poster Session				
Perfusion	92	4	0	4
Allied Health	77.7	8.9	7.7	5.7
Case Study/Abstract				
Perfusion	72	8	20	0
Allied Health	76.0	11.1	8.9	4.0
Panel Discussion				
Perfusion	80	8	4	8
Allied Health	75.6	12.4	8.9	3.1

**Table 7**  
**Publications**

Item	None	1-3	4-6	7 or more
<b>Number of Research Publications (Percent)</b>				
As Primary Author:				
Perfusion	47.4	31.7	10.6	10.6
Allied Health	69.5	22.5	5.3	2.6
As Coauthor				
Perfusion	42.1	31.6	10.5	15.8
Allied Health	72.3	21.3	4.3	2.2
<b>Number of NonResearch Publications (Percent)</b>				
	None	1-3	4-6	7 or more
As Primary Author				
Perfusion	71.4	28.5	0	0
Allied Health	75.6	19.0	3.2	2.2
As Coauthor				
Perfusion	78.6	21.3	0	0
Allied Health	86.0	11.6	1.6	0.7

it is somewhat disturbing that two thirds had never had a research project approved with or without funding. These statistics suggest an inability to write proposals and to get funding as well as a lack of awareness of available funding. This corresponds with the survey participants' responses that over 70% needed to acquire skills in the ability to get funded and 40% in how to write proposals.

There also seems to be a discrepancy between the numbers involved in research and the dissemination of the results in the forms of presentations or publications. The vast majority of perfusion faculty had been involved in one or more projects, yet 68% had never presented at a symposium or major session, 56% had never presented a major research paper, and approximately one half had never published any type

**Table 8**  
**Collaborative Research Interest**

Item	PERFUSION		ALLIED HEALTH
	Frequency	Percent	Percent
Interested in Collaborative Research			
Yes	20	76.9	75.3
No	6	23.1	24.7
Preferred Research Associations			
Colleagues in your discipline at your institution	18	90	84.4
Colleagues in your discipline at another institution	20	100	87.5
Colleagues not in your discipline at your institution	14	70	67
Colleagues not in your discipline at another institution	12	60	50.7
Skills in Collaborative Research			
As a Primary Investigator	8	44.4	34.3
As a Coinvestigator	18	94.7	80.6
As a Data Collector	11	57.9	67.8

**Table 9**  
**Research Skills Needed**

Skill Needed	PERFUSION		ALLIED HEALTH
	Frequency	Percent	Percent
1. Getting funded	18	78.3	84.3
2. Statistical analysis of data	11	44	71.7
3. Getting the paper published	10	43.5	58.0
4. Writing a proposal	9	39.1	51.9
5. Developing a research design	7	28	54.9
6. Identifying the research problem	7	28	27.6
7. Presenting the paper	6	24	26.1
8. Defining the research objective	6	24	29.9
9. Writing protocols	5	20.8	54.9
10. Writing the paper or abstract	4	16	31.8
11. Data collection	0	0	23.3

of article. This discrepancy exists for allied health faculty as well. It may be explained in part by a lack of some research skills. Many respondents noted they needed to acquire and improve skills in statistical analysis and in getting a paper published. About two thirds of the respondents were interested in acquiring these types of skills at workshops at professional meetings.

Other factors influencing the low productivity are characteristics of the research environment itself. Research is not highly rewarded or given a high priority at most institutions. It is not strongly supported financially or administratively. The personal interest in research of the survey participants is high even

though the average time spent per week is only about four hours. Most would prefer to spend more time actively involved in research, but the lack of support and the confusion over the roles of teaching, research, and service make this difficult.

One way to increase productivity is by collaboration on projects. Collaboration allows increased usage of resources, and access to larger population sizes. This means wider generalizations can be made.<sup>5</sup> Over three fourths of the perfusion faculty and about one half of the allied health faculty currently collaborate on projects and three-fourths are interested in doing so in the future. In future collaborations the respondents would prefer to work with professionals in their own disci-

**Table 10**  
**Preferred Continuing Education Methods**

Type of Event	PERFUSION		ALLIED HEALTH
	Frequency	Percent	Percent
Workshops at professional meetings	16	64	64.4
National seminars/conferences	12	48	49.5
Self-instructional module	10	40	43.3
Consultation service	5	20	32.2
Correspondence course	6	24	24.9

**Table 11**  
**Characteristics of the Research Environment**

CHARACTERISTIC*	MEAN VALUES	
	Perfusion	Allied Health
Research rewarded	3.88	4.2
Research given priority	3.58	3.9
Professional resources available	4.69	3.6
Personal interest in research	5.19	5.1
Many research opportunities	4.42	4.0
Computer is accessible	4.68	5.1
Research is financially/administratively supported	3.65	3.5
Department supports research	4.54	4.4
Coworkers encourage research	4.39	4.2
Statistical services available	5.08	4.5
Research important for promotion/tenure	3.96	4.5
Importance of research vs. service vs. teaching is well defined	2.92	3.5

\*Characteristics were rated on a scale from 1 to 7

plines but are also interested in interdisciplinary and interinstitution collaboration. All faculty indicated a preference to serve as a coinvestigator (CI) in collaborative research as opposed to a primary investigator (PI). Some may see these joint projects as a way to learn from more experienced researchers. Others may have the skills, but not the time required, for a PI.

Overall, both perfusion and allied health faculty indicated low research productivity. Perfusion faculty do, however, appear to be slightly more productive than the general allied health group even though their educational background, sponsoring institution, and position on tenure are not as positive a factor for research productivity as they are for allied health faculty. All allied health professionals, including perfusionists, need to acquire the necessary research skills and, along with the administrators, increase the priority of and support for research.

### References

1. Broski, D.C., Olson, R.R. and Savage, A.A. Increasing Research Productivity in University-Based College of Allied Health. *J. Allied Health* 14(1):160-162, 1985.
2. Holcomb, J.D. & Roush, R.E., Faculty Appointments, Promotions & Tenure Policies in Allied Health Professions. *J. Allied Health* 6(24), 1977.
3. Conine, T.A., Schilling, L.M., Pierce, E.R. The Relative Importance of Supportive Data for Promotion and Tenure Reviews. *J. Allied Health* 14:183, 1985.
4. Blackburn, R.T. The Meaning of Work in Academia. *New Directions for Institution Research*, 1(2):75, 1974.
5. Bergstrom, N. Hansen, B., Grant, M., Hanson, R., Kubo, W., Padilla, G., Wong, H. *Nursing Research*, 33(1):20-25, 1984.

### Questions from the Audience

*Question: Frank Hurley, Chicago, IL: Did you study the number of individuals involved in a given subject area relative to their activity?*

*Response: As far as a type of research?*

*Question: No. What I mean is that we're making some comparisons and generalizations about perfusion research here and my concern pertains to the number of people doing perfusion rather than other allied health activities. Did you study the number of people within that medical discipline?*

*Response: No. We do not have any statistics on the total number of perfusionists, or total number of physical therapists, so we could not make a comparison as far as that.*