

# Laboratory Managers' Views on Attrition and Retention of Laboratory Personnel

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**OBJECTIVE:** This study was undertaken to provide information on the current shortage of clinical laboratory employees and to identify strategies for retaining laboratory employees.

**DESIGN:** A paper survey was distributed to 800 clinical laboratory managers.

**SETTING:** The survey was sent to laboratory managers at their work sites.

**PATIENTS OR OTHER PARTICIPANTS:** 190 usable surveys were returned for a response rate of 24%.

**INTERVENTIONS:** Surveys were mailed in March 2003.

**MAIN OUTCOME MEASURES:** The number of CLTs and CLSs considered fully staffed at the laboratory managers' institutions, the numbers of CLTs and CLSs who left the institutions in a five-year period, and the reasons employees left were tabulated. The managers' responses to questions on the factors that they considered most important in retaining laboratory employees were tabulated and categorized.

**RESULTS:** In this five-year period (1998-2002), 5% of employees left their jobs annually. Over 60% of laboratory employees who left did so in the first five years of practice. The top five reasons that employees left their jobs were: 1) new laboratory job, 2) moved/family obligations, 3) retirement, 4) left the field entirely, and 5) employee was fired. In the first year of practice, 15% of the employees who left were fired. Between one and five years of practice, 7.3% left because of the hours or shift, 6.7% left to pursue further

education for a non-laboratory career, and 6.7% left the field entirely. In the group of employees who left between five and ten years, 13.5 % left the field entirely and 5.2% left for sales or clinical trials positions. Over 40% of the employees with more than ten years of experience who left did so because of retirement.

**CONCLUSION:** Most laboratory employees who left did so to take another laboratory position; however, reasons for leaving vary with years of experience. The number of laboratory employees leaving the profession exceeds the number of new graduates entering the profession making the retention of employees essential. Laboratory managers identified salary as the most important retention factor.

**ABBREVIATIONS:** ASCLS = American Society for Clinical Laboratory Science; ASCP = American Society for Clinical Pathology; BLS = Bureau of Labor Statistics; CLMA = Clinical Laboratory Managers Association; CLS = clinical laboratory science; CLSs = clinical laboratory scientists; CLTs = clinical laboratory technicians.

**INDEX TERMS:** clinical laboratory personnel; job satisfaction; personnel retention; personnel shortage; clinical laboratory staffing; workforce attrition.

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The clinical laboratory profession has been experiencing a personnel shortage for approximately 15 years.<sup>1</sup> Though the

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shortages subsided slightly in the mid-1990s, they returned dramatically at the end of the decade.<sup>2</sup> Renewed efforts in recruiting students and attention to retaining laboratory staff have lessened the shortage slightly as reported in the most recent surveys by the American Society for Clinical Pathology.<sup>3,4</sup> Such efforts will need to continue in order to maintain the laboratory workforce at current levels; however, it is unlikely that this level will meet the workforce needs of healthcare institutions in the future.

The Bureau of Labor Statistics (BLS) reports that about 297,000 individuals held positions as clinical laboratory scientists (CLSs) and clinical laboratory technicians (CLTs) in 2002.<sup>5</sup> Unfortunately, it is difficult to get an accurate count of clinical laboratory professionals because they are not licensed in most states. According to the BLS, a growth rate of 10% to 20% per year is expected through 2012 and this equates to a need for up to 59,000 new CLTs and CLSs over the next eight years, or nearly 7,500/year. Although the BLS estimate takes into account average rates of attrition including retirements, the retirement rate is expected to climb as the baby boom generation retires. National professional organizations such as the American Society for Clinical Laboratory Science (ASCLS) estimate the age of their average member to be in the late 40s (unpublished data, 2004). Therefore, the BLS estimate of 7,500 new laboratory professionals needed each year is probably too low.

The majority of new laboratory professionals will be graduates of formal CLT or CLS educational programs. In 2003, the number of graduates of educational programs accredited by the National Accrediting Agency for Clinical Laboratory Science (NAACLS) was approximately 4,000.<sup>6</sup> In the past few years, national organizations and educational programs have increased recruitment efforts and many programs have seen an increase in the number and quality of students.<sup>7</sup> Even if all programs were fully enrolled and all the students in the programs graduated, it is unlikely that the number of graduates would meet the projected need for 7,500 new laboratory professionals. It is clear that the current personnel shortage must also be addressed by improving the retention of laboratory employees.

Previous studies of the clinical laboratory workforce have discussed the connection between employee retention and personnel shortages. In a survey of laboratory managers, Gardner and Estray determined that turnover, rather than reduced entrants, was the major factor contributing to the shortage at the end of the 1980s.<sup>8</sup> They also projected that

a low entry rate to the profession would exacerbate shortages by the end of the 1990s.<sup>9</sup> Other surveys of laboratory managers have yielded recommendations for improving employee satisfaction and retention including increasing salaries, improving recognition, improving opportunities for career advancement, reducing job stress, improving work hours, and allowing staff more control over their work.<sup>10,11</sup>

Surveys of laboratory practitioners have been consistent in identifying salary as a major issue in employee satisfaction and retention.<sup>12-17</sup> Poor benefits, job stress, limited advancement opportunities, and lack of recognition are also often mentioned as reasons people are dissatisfied and likely to leave the clinical laboratory profession. In a 2003 survey of laboratory practitioners, salary topped the list of factors considered important for employee retention.<sup>18</sup> The lack of parity with health professionals who have similar education and experience was the chief source of dissatisfaction with salary. Although not as strongly felt, the second most commonly mentioned source of dissatisfaction was lack of recognition from physicians and nurses. Practitioners also cited the short staffing that leads to long work hours as contributing to employee attrition.

This study was undertaken to provide information on the current shortage of clinical laboratory employees and to identify strategies for retaining laboratory employees. A national survey of laboratory employees who left their jobs would be the most informative in understanding the magnitude of the problem and the reasons for attrition. Because that population cannot be easily reached, a survey of laboratory managers was used to obtain their perspective on why their employees left. Specifically, this study addressed the following questions:

1. Why do laboratory practitioners leave (from their managers' perspectives)?
2. How many are leaving and when are they leaving?
3. Are reasons for leaving different based on the number of years practitioners have worked, the institution size, or the level of practice (CLT or CLS)?
4. What strategies do laboratory managers think are most effective in retaining employees?

## MATERIALS AND METHODS

The researchers prepared a survey, list of definitions, and cover letter for clinical laboratory managers with questions related to the attrition and retention of CLT and CLS practitioners. Laboratory managers were asked to provide the number of CLTs and CLSs that is considered fully staffed at their institu-

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tion. For each employee who left in the five-year period (1998-2002), managers were asked to provide the practitioner's level of practice (CLT or CLS), years of employment, and reason for leaving. Laboratory managers were also asked to identify the factors that they felt were most important for employee retention and describe the policies or practices that they found most successful in retaining employees. The survey also included demographic questions on geographic location, type of work facility, size of institution, primary job function, licensure, gender, ethnicity, highest degree, and years of experience. To group geographic locations, the American Society for Clinical Laboratory Science (ASCLS) regions were used.

The survey, cover letter, and definitions were reviewed by an advisory board comprised of laboratory managers, practitioners, and educators. The survey was tested in a pilot study using a convenience sample of laboratory managers known to the researchers. The results of the pilot study were reviewed and the survey was revised based on these suggestions. The survey and cover letters were approved by the University Committee on Research Involving Human Subjects of Michigan State University, E Lansing, MI.

The managers selected for the study were identified from the mailing list of the Clinical Laboratory Managers As-

**Table 1.** Supervisors' perceptions of the reasons employees left laboratory positions between January 1, 1998 and December 31, 2002 grouped by years of experience

	Percent of employees who left				
	All employees (n = 1039)	Left ≤1 year (n = 223)	Left >1 and ≤5 years (n = 356)	Left >5 and ≤10 years (n = 155)	Left >10 years (n = 174)
New laboratory job (technical or administrative)	<b>31.7*</b>	<b>32.3*</b>	<b>34.6*</b>	<b>35.5*</b>	<b>19.0*</b>
Family obligations/moved	18.1	19.7	21.1	19.4	9.2
Retirement	9.2	0.4	0.8	4.5	42.4
Left laboratory field entirely	8.7	5.8	6.7	13.5	11.5
Fired	6.4	15.2	5.1	3.2	2.3
Hours (shift, wanted FT or PT)	6.1	6.7	7.3	3.9	3.4
Further education for a non-laboratory career	5.0	4.0	6.7	4.5	2.3
Sales or clinical trials	4.0	1.7	4.8	5.2	3.4
No reason given	1.9	4.6	1.7	2.6	0.0
Other (stress, commute, wanted patient contact, called to military service)	2.3	2.2	2.6	3.2	0.6
Health, personal reasons, deceased	2.8	3.2	2.5	1.9	4.6
Sought better salary	1.8	1.4	3.1	1.9	0.6
Further education in laboratory field	1.2	2.3	1.7	0.0	0.0
Technical position in a research laboratory	0.8	0.5	1.3	0.7	0.7

\* The top five reasons in each group are in bold print.

sociation (CLMA). They were selected by choosing every sixth name from the zip code sorted list. To maximize the likelihood that the survey recipient would be a laboratory manager, individuals whose place of employment or job title suggested they were not managing a laboratory were deleted. Eight hundred managers were selected for the final mailing. The surveys were sent in March 2003, with cover letters and postage-paid return envelopes. Two weeks after sending the manager packets, a follow-up reminder postcard was sent to all managers.

### Data analysis

SPSS 11.5 was used to analyze the data collected in this study. The response rate was calculated by dividing the number of usable surveys returned by the total number mailed. Descriptive statistics were used to tabulate responses and calculate means. The number and percent of employees who left laboratory positions for each of 14 different reasons were tabulated (Table 1). Employees were further grouped by years of experience, size of institution, and certification level. In each of these groups, the employees' reasons for leaving were tabulated and the top five reasons were identified. Because of the small number of employees in some categories, Chi square analysis was not used to analyze differences among these groups. Participants' written responses to the question, "What factors do you think are most important in retaining qualified clinical laboratory practitioners in your laboratory?" were tabulated and grouped into major categories by the researchers.

## RESULTS

### Response

A total of 190 usable surveys were returned which represents a 24% response rate.

### Demographic information on respondents

The laboratory managers came from all geographic regions of the country. The highest percentage of responding managers (16.5 %) came from the ASCLS Region IV (MI, IN, OH, KY) and the lowest percentage of responding managers (2.1%) came from ASCLS Region VIII (CO, ID, MT, UT, WY). In the other ASCLS regions, the percentage of responding managers ranged from 8.0 % to 15.4%.

Most of the laboratory managers worked in hospitals or medical centers (77.9%). The next largest percentage worked in physician office or group practice laboratories (10.5%) or reference laboratories (5.3%). A small percentage of the respondents indicated that they worked in academic health centers (1.6%) or HMOs (0.5%).

To assess institution size, laboratory managers were asked for the annual volume of tests performed in their clinical laboratories. Approximately 13% of the laboratory managers worked in institutions with annual test volumes of less than 100,000. Most respondents (44.1%) were from institutions with annual test volumes between 100,001 and 500,000. One fourth of the laboratory managers worked in institutions with test volumes between 500,001 and 1,000,000 per year and 18.1% worked in institutions with test volumes greater than 1,000,000 per year.

The survey respondents identified their job functions as Laboratory Manager/Administrator/Director (86.3%), Laboratory Supervisor (10.5%), or CLS (2.1%). The majority of the laboratory managers were not licensed (76.3%). The managers were primarily female (71.1%) and Caucasian (93.7%). The ethnic group selected by the second highest percent of respondents was Asian (2.6%). None of the laboratory

Table 2. Laboratory managers' academic degrees grouped by years of experience

Degree	Laboratory managers with ≤25 years of experience		Laboratory managers with >25 Years of experience		Total	
	#	%	#	%	#	%
Associate	0.0	0.0	8	7.9	8	4.2
Baccalaureate	50	57.5	64	62.7	114	60.3
Master's Degree	35	40.2	29	28.4	64	33.9
Doctorate	2	2.3	1	1.0	3	1.6
Totals	87	100	102	100	189	100

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managers were African American and a small number were Hispanic (0.5%) and Native American (1.6%).

The laboratory managers' years of experience ranged from 8 to 45 years with a mean of 26.6 years (SD = 7.06). Laboratory managers had worked for a mean of 9.5 years in their current jobs. Approximately sixty percent (60.3%) of managers listed the baccalaureate degree as their highest degree. One third of the laboratory managers had a Master's degree and 1.6% had a doctoral degree. Some respondents (4.2%) listed the Associate Degree as their highest degree. Laboratory managers were separated into two groups; those with 25 years of experience or less and those with more than 25 years of experience. The number and percent of managers in each group and their degrees is shown in Table 2.

### Attrition

Laboratory managers were asked to list the number of CLTs and CLSs that is considered 'fully staffed' in their institutions. One hundred eighty five (185) laboratory managers responded to this question and listed 1688 CLTs and 2499 CLSs for a total of 4187 employees. The average number of employees (CLTs and CLSs) in these 185 institutions was 22.6. The laboratory managers identified 1046 employees who left their institution in the five-year period between January 1, 1998 and December 31, 2002. Two hundred fifty eight (258) CLTs, 733 CLSs, and 55 employees who were not identified as CLTs or CLSs left these institutions. The employees who left were employed for a mean of 6.7 (SD = 7.8) years before they left. Approximately 25% of the employees who left, did so in the first year of practice. Over sixty percent (63.9%) of the employees who left, did so in five years or less.

**Table 3.** Supervisors' perceptions of the reasons employee left their laboratory positions between January 1, 1998 and December 31, 2002 grouped by institution size and certification

	Percent of employees who left			
	Annual test volumes		Certification of employees	
	< = 500,000 (n = 391)	>500,000 (n = 617)	CLT (n = 256)	CLS (n = 733)
New laboratory job (technical or administration)	<b>34.5*</b>	<b>29.4*</b>	<b>28.6*</b>	<b>32.3*</b>
Family obligations/moved	14.8	19.9	18.0	18.2
Retirement	7.4	10.8	5.1	10.8
Left laboratory field entirely	9.0	9.0	7.4	8.8
Fired	6.9	6.2	10.2	5.2
Hours (shift, wanted FT or PT)	5.4	6.7	9.8	4.6
Further education for a non-laboratory career	4.9	5.1	4.3	5.3
Sales or clinical trials	3.1	4.7	1.6	4.9
Other (stress, commute, wanted patient contact, called to military service)	4.1	1.2	2.4	2.3
No reason given	1.8	1.3	3.4	1.6
Health, personal reasons, deceased	5.3	1.3	3.4	2.4
Sought better salary	0.8	2.6	3.4	1.4
Further education in laboratory field	1.0	1.1	2.0	1.1
Technical position in a research laboratory	1.0	0.7	0.4	1.1

\* The top five reasons in each group are in bold print

The laboratory managers' perceptions of the reasons that employees left in the five-year period between January 1, 1998 and December 31, 2002 are listed in Table 1. Laboratory managers listed reasons for 1039 of the 1046 employees who left. The highest percentage of employees (31.7%) left to take a new technical or administrative position in the laboratory. The next highest percentage of employees (18.1%) left because of family obligations or because they moved. Retirement was listed as the reason for 9.2% of the employee attrition. Approximately nine percent (8.7%) left the laboratory field entirely and 6.4% were fired.

Laboratory managers were asked to indicate how long an employee had worked for them before leaving. Managers provided this information for 908 of the employees who left. The reasons for leaving were tabulated for four groups of employees; 1) those who had worked one year or less, 2) those working between one and five years, 3) those working between five and ten years, and 4) those who had worked more than ten years (see Table 1). In the first three groups, most employees left for a new laboratory position or because of family obligations/relocation. Approximately 15% of employees who left in the first year of practice, did so because they were fired. The reasons employees who had worked between one and five years left included the hours or shift (7.3%), the pursuit of education for a non-laboratory career (6.7%), and a decision to leave the field entirely (6.7%). In the group of employees who left between five and ten years, 13.5% left the field entirely and 5.2% left for sales or clinical trials positions. In the fourth group, those who worked for more than ten years, the highest percentage of employees left for retirement (42.4%).

The reasons employees left were also tabulated for employees from institutions with volumes of 500,000 tests/year or less and those from institutions with volumes greater than 500,000 tests/year (see Table 3). A higher percentage of employees from smaller institutions than employees from larger institutions left for health or personal reasons (5.3% vs. 1.3%). Reasons for leaving were also tabulated for employees certified as CLTs and those certified as CLSs (Table 3). A higher percentage of CLSs than CLTs were retiring (10.8% vs. 5.1%) and leaving for sales/clinical trials positions (4.9% vs. 1.6%). More CLTs than CLSs were fired (10.2% vs. 5.2%).

Given a list, the managers were asked to identify policies or practices that were most successful in retaining employees in their laboratories. The top ten policies or practices and the percentage of managers selecting each policy were:

1. Raised salaries (36.5%)
2. Adjusted employee hours to fit family obligations (18.9%)
3. Gave employees more responsibility for day to day decisions (15.3%)
4. Spent more time praising employees for good performance (8.4%)
5. Involved laboratory staff in new projects, e.g., method comparison (7.9%)
6. Actively recruited new staff to fill vacancies (7.9%)
7. Resolved personnel conflicts (6.8%)
8. Improved the physical environment of the laboratory (5.8%)
9. Increased overtime pay or shift differentials (5.3%)
10. Developed employee appreciation programs (4.2%).

Managers also responded to the question, "What factors do you think are most important in retaining qualified clinical laboratory practitioners in your lab?" This open-ended question allowed managers to express their opinions and add retention factors that may not have been addressed in the list provided on the survey. The ten factors that were mentioned most often by the managers are listed below with the percentage of managers listing that factor:

1. Salaries and benefits that are competitive with other institutions and other professions with comparable education and responsibility (67%)
2. Flexible scheduling, no weekends, no shift work (35%)
3. Positive feedback, praise, recognition for work (22%)
4. Involvement in decision making, individual responsibility, and control (22%)
5. Good management team (20%)
6. Good co-workers, good team work (18%)
7. Recognition and respect from nursing, administration, pathologists, and the public (16%)
8. Work that is challenging, satisfying, interesting, varied work (14%)
9. Good work environment (14%)
10. Adequate staffing, good workload, reduced stress (14%).

## DISCUSSION

The response rate for this survey was 24%, which is comparable to similar surveys of laboratory managers.<sup>9,19</sup> The laboratory managers came from all geographic locations and from institutions of all sizes. Most were from hospitals or medical centers and 98% listed their job function as supervisor, director, or administrator. The survey method, therefore, appeared to be successful in reaching the target population

and providing results that are representative of views of the laboratory managers across the country.

The laboratory managers in this study were predominately women (71%) and most had a baccalaureate degree (60.3%). Previous studies documented a lower percentage of women in laboratory management. A 1980 ASMT National Compensation Survey reported that 32% of the managers or supervisors were women and a 1989 ASMT national survey found that 55% of the laboratory managers were women.<sup>9,20</sup> The percentage of women in management has increased in the past 25 years and is now similar to the percentage of women in the overall population of laboratory employees.<sup>21</sup> Over 40% of the laboratory managers with 25 years of experience or less had obtained an advanced degree compared to 29.4% of the laboratory managers with more than 25 years of experience. A master's or a doctoral degree was not typically needed for laboratory management positions in the past; however, younger managers may have found the advanced degree helpful in preparing for management positions and competing for job openings.

Laboratory managers report that approximately 25% of the employees who left did so in the first year of practice and over 60% of those who left did so in five years or less. A higher percentage of employees leaving early is not surprising because in the first few years of practice, employees may be learning whether or not the clinical laboratory environment is a good match for them. It is also a time when employees may need mentoring and close supervision to ensure that new employees are given as much assistance and encouragement as possible. The problem of losing employees early in their careers is not unique to the clinical laboratory profession. A national report on attrition in teaching states that almost one-third of teachers in the United States leave the field within the first three years of practice and half of the teachers leave before their fifth year.<sup>22</sup>

This study attempted to determine how many laboratory employees are leaving the profession. Laboratory managers in these 185 institutions reported that a total of 4187 CLT and CLS employees would be considered fully staffed. They also reported that a total of 1046 employees left their institutions in a five-year period. If 1046 employees left in a five-year period, an average of 209 employees left each year. This represents 5% of the total population (4187 employees) reported by these laboratory employers. The Bureau of Labor Statistics reported that there were 297,000 laboratory employees in 2002.<sup>5</sup> If 5% of those 297,000 laboratory employees left, this would create 14,850 vacancies each year.

According to the additional information collected in this survey, approximately 32% of the employees left for new laboratory positions. So, although 14,850 laboratory positions may be vacated each year, not all of those employees left the laboratory profession. If the number of laboratory employees who are leaving is adjusted for the 32% of employees who left for new laboratory positions, the estimated number of people leaving the clinical laboratory annually is 10,098.

Any estimate of the number of laboratory employees leaving the field will be flawed because reliable data on the current laboratory workforce are not available. Nevertheless, both of the estimates in this study and the BLS estimate of the number of new professionals needed are higher than the number of students graduating from CLT and CLS programs each year. The results of this study underscore the critical need for retention of laboratory employees.

The top five reasons that employees left their jobs according to the laboratory managers were: 1) left for a new laboratory job, 2) moved or left due to family obligations, 3) retirement, 4) left the field entirely, and 5) the employee was fired. A review of the reasons for leaving for employees with varying years of experience provided additional descriptive information that may help managers address retention issues. For laboratory employees who had worked for ten years or less, more than half of the employees left for the first two reasons (new laboratory job or moved). The first reason, leaving for a new laboratory job, is a positive sign. This may indicate that employees are finding opportunities that better fit their interests or they have advanced in their careers. Although an employee created a vacant position for one manager, the individual was retained in the laboratory profession. The second reason for leaving, moving/family obligations, also leaves a vacancy and if the individual moves to a new area and seeks another laboratory position, the individual may not be lost from the profession. Laboratory managers may be able to help retain employees in the profession if they provide networking information for employees who move.

Approximately 15% of the employees who left in the first year of practice did so because they were fired. The percentage of employees who were fired was higher in this group than in groups with more than one year of experience. This would seem to indicate that laboratory managers are dealing with problems early in their employees' careers and removing employees who can't handle the work of the clinical laboratory. This sets a standard of excellence for all employees and

contributes to all employees' pride in their work. There are other possible explanations for the high percentage of employees who were fired in the first year of practice including insufficient orientation or training and unrealistic expectations of the work.

The highest number (356) of employees in this study who left, did so between one and five years. In this group, 7.3% left because of the hours, 6.7% left to pursue further education for a non-laboratory career and 6.7% left the field entirely. Those dissatisfied with their shift or hours may have taken an undesirable shift in an entry-level position with the hope that they would soon move to better shift. If that did not happen in the first five years of practice, the employee may have decided to seek other career opportunities. Those leaving for further education or leaving the field entirely may not have been challenged in their current positions.

The higher loss of employees in the first five years may also be a reflection of differences between what the laboratory environment provides and what younger employees find satisfying. Further research is needed to assess the degree to which generational value differences influence retention factors. Because this is a crucial time for employee retention, laboratory managers should pay close attention to these employees' level of satisfaction with their hours and their job responsibilities. This is also an important time to provide a mentor for laboratory employees. The opportunity to discuss career options, frustrations, and future plans with an experienced laboratory professional may help these younger employees deal with difficulties and make a commitment to the laboratory profession.

The results of this study indicate that fewer employees are lost after five years, but because these employees have additional years of experience and clinical expertise, their loss may be more significant for an institution than the loss of younger employees. In the group of employees who left between five and ten years, 13.5% left the field entirely. Although managers reported that only approximately 2% of employees in this group left because they were seeking better salaries, the desire for a higher salary may have been an underlying factor in the decision to leave the field.

The highest percentage of employees who left because of retirement was in the fourth group of employees, those who left after working for more than ten years. The high percent of people leaving for retirement in this group (42.5%) is consistent with the descriptions of the aging clinical laboratory workforce and

there is little managers can do to prevent this type of attrition. The lowest percentage of employees in this group left for new laboratory positions indicating that after ten years, employees may be committed to their jobs until retirement.

A higher percent of CLS employees left for retirement than CLT employees, possibly because there were not as many graduates of CLT programs 30 years ago. More CLSs also left for positions in sales and marketing possibly because those positions require a baccalaureate degree. A higher percent of CLT employees were fired than CLS employees. Additional information would be needed to understand this difference; however, one possible explanation is that some employees classified as CLTs by the managers in this survey had job titles of "clinical laboratory technician" but did not have formal education or hold national certification as a CLT.

The managers in this study were very aware of the importance of retaining laboratory employees. In their responses to questions on the factors and practices that they thought contributed to employee retention, four issues were mentioned most often. They were salary, scheduling, staffing, and supervision/management. In the classic work of Herzberg on employee motivation, factors contributing to employee satisfaction and motivation were distinguished.<sup>23</sup> Hygiene factors, such as supervision, work conditions, interpersonal relationships, and salary are necessary for satisfaction but not sufficient for motivation. Whether guided by this research or not, laboratory managers appear to appreciate that satisfaction with hygiene factors is essential to retention. The factors that managers listed most often as important in employee retention were hygiene factors such as raising salaries, flexible scheduling, adequate staffing, and good supervision.

Herzberg's findings suggest that satisfaction with hygiene factors alone will not be sufficient to address employee retention. Commitment to the clinical laboratory profession would be expected to depend on motivational factors like achievement, recognition, responsibility, and advancement opportunities. Managers' responses demonstrate that they also value motivational factors. For example, one manager listed the following factors as important for retention; "opportunity for continuing education and promotion, some degree of self-governance, a climate of trust and respect and open frequent communication, appreciation, team process improvement and a culture where fun is OK and there is no fear."

Yet Herzberg's work would predict that efforts in these motivational areas will be effective only with employees who are

already satisfied with the hygiene factors. Unless laboratory managers address the hygiene factors, their efforts to motivate and instill the professional commitment necessary for retention will be undermined. This represents a significant challenge to laboratory managers and healthcare institutions because it will call for additional resources to raise salaries and hire enough laboratory practitioners to improve scheduling issues. The salary challenge in particular may be greater than some managers appreciate because merely raising salaries higher than current levels may not be adequate. Laboratory employees are acutely aware that their salaries have fallen below that of other healthcare professionals and satisfaction with salaries will mean compensation that is equivalent to healthcare professionals with similar education and experience.<sup>18</sup>

## CONCLUSIONS

A description of the reason why laboratory employees left over a five-year period showed that most employees who left their jobs, did so to take a new laboratory job. This is an encouraging finding indicating that these employees are staying in the profession and making a further commitment to their laboratory careers. The second highest percentage of employees who leave, are doing so because of a move, usually for family reasons. There is little laboratory managers can do about this group, other than help them make connections with laboratory managers in their new location.

Given that there are some things that laboratory managers can do nothing about such as employees moving, it is important to look at the other reasons employees leave to see if managers can influence those employees. Most laboratory employees who leave are doing so in the first five years of practice and, in addition to leaving for new laboratory jobs and leaving because of moving, employees in this group left because of the shift or hours and to pursue further education. Laboratory managers should work to monitor employees' concerns about hours and provide a work environment that provides challenges and opportunities for continued learning. Although fewer employees leave after five years, they take a great deal of expertise with them when they leave and many of these employees are leaving the field entirely. Many institutions have salary bonuses to attract new employees; however, a plan for rewarding experienced employees is just as important to prevent a 'brain drain' in the clinical laboratory.

This study represents a first step in understanding why employees leave the clinical laboratory in the first decade of the 21st century. Additional studies are needed to better understand this complex issue and assess differences among groups of employees. Studies that collect data directly from

employees who left laboratory positions are needed as well as studies that collect parametric data and provide statistical comparisons among groups. Studies of employee attrition across multiple disciplines would also be helpful in identifying common problems and shared solutions.

In every question on this survey on strategies for retaining employees, laboratory managers listed salaries as the most important retention factor. Hospital administrators have responded to shortages in nursing and radiologic technology with higher salaries, but there has not been a similar response to the shortage of laboratory personnel. This may be because the laboratory is behind the scenes and the impact on patient care is not as evident as that of nursing or radiologic technology. Also, laboratory employees often work extra hours to make sure that laboratory results are available and accurate and this mitigates the effect of the shortage on the institution. The shortage of laboratory personnel does, however, have an effect on the institutions' finances when the costs of recruiting and new employee orientation are considered and this should be documented for hospital administrators.

In a study of one medical center, turnover costs represented about 5% of the annual operating costs which was equivalent to giving every nurse on staff a 33% retention supplement each year.<sup>24</sup> Laboratory managers need to make the case to administrators in their institutions that until the salary issue is addressed, laboratory employees will continue to leave and the numbers cannot be entirely replaced by new graduates. However, the work of improving salaries is not the sole responsibility of the laboratory managers. Laboratory employees must help administrators understand the value of the clinical laboratory by presenting a professional image at all times and by contributing to institution-wide committees and projects. In addition, evidence that timely, accurate laboratory tests improve patient care and shorten length of stay must be collected to support efforts to raise salaries.

This study provided an estimate of the number of people who are leaving the profession each year. Although this estimate is limited by the lack of good data on the current number of laboratory professionals, it far exceeds the number of students graduating from CLT and CLS programs each year. Continued recruiting efforts are needed, and in some areas, more educational programs may be indicated; however, this problem will not be solved simply by educating more CLT and CLS students. Workplace issues directly affect recruitment and savvy students will not choose educational programs that lead to undesirable careers.

If talented young people are not attracted to the laboratory profession and competent practitioners are not retained in the laboratory workforce, the quality and availability of laboratory services will decline. The personnel shortage has led to 'stop gap' measures such as sign on bonuses, hiring non-certified personnel, and asking more of current employees. These short-term approaches may mean that the laboratory functions for one more day, but they do not help retain laboratory practitioners. Creating an environment in which laboratory practitioners are compensated for their education and experience and have opportunities for continued professional growth is essential for the future of the laboratory profession and for the health of the public.

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