Factors Contributing to the Retention of Clinical Laboratory Personnel

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OBJECTIVE: To identify factors contributing to retention of clinical laboratory practitioners.

DESIGN: A paper survey addressing retention was distributed to a potential of 4000 clinical laboratory professionals.

SETTING: The survey was distributed to subjects by their laboratory manager to be completed at the worksite or home.

PATIENTS OR OTHER PARTICIPANTS: 599 usable surveys were received from non-supervisory individuals employed in clinical laboratory science (CLS) for five years or more.

INTERVENTIONS: Surveys were mailed to laboratory managers in March 2003 with directions to distribute to practitioners with five or more years of work experience.

MAIN OUTCOME MEASURES: Percentages of respondents agreeing and disagreeing with Lickert-type opinion items were determined. The means, ranges, and standard deviations were calculated for the number of hours of continuing education, years of experience, percentage of time spent on tasks, and years in the current job. The means for job satisfaction were calculated and compared statistically based on respondents' job function, satisfaction with salary, job independence, sense of appreciation, and responsibility for continuing education. Open-ended responses were tabulated and categorized.

RESULTS: Committed practitioners believe their work is important and find it challenging. Those who are most satisfied with their jobs believe they make a good salary ($p = 0.000$), have work independence ($p = 0.000$), and feel that their work is appreciated ($p = 0.000$). Job satisfaction does not differ for CLTs vs. CLSs. Salaries comparable to nurses and appreciation from physicians, nurses, and hospital administrators are cited by respondents as the most important factors to retaining laboratory staff.

CONCLUSION: Committed practitioners believe that salaries comparable to nurses are needed to improve retention of staff. Respondents said that being appreciated by hospital administrators, nurses, and physicians would also contribute to improved retention.

ABBREVIATIONS: ASCLS = American Society for Clinical Laboratory Science; ASCP = American Society of Clinical Pathology; CE = continuing education; CLMA = Clinical Laboratory Managers Association; CLS = clinical laboratory science; CLSs = clinical laboratory scientists; CLTs = clinical laboratory technicians.

INDEX TERMS: clinical laboratory manpower; clinical laboratory techniques; job satisfaction; medical technology; retention.

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For the clinical laboratory profession, the first years of the 21st century have been marked by a shortage of qualified personnel.[1,2] While the Bureau of Labor Statistics projects an annual need for 9000 laboratorians through 2008, the number of graduates of clinical laboratory technician (CLT) and clinical laboratory science (CLS) programs is only half of that.[3,4] The current personnel shortage has exceeded the shortage of the early 1990s and it has a slightly different flavor.[5,6] The average age of laboratorians is now believed to be in the late 40s (unpublished data, 2004) and more of the workforce is closer to retirement than it was a decade ago. Impending retirements will exacerbate the shortage and future-oriented laboratory managers have reason to be more concerned about this personnel shortage than they were in 1990. One approach to addressing the shortage is to attract new individuals to the laboratory professions. This task falls more heavily on faculty in educational programs than on laboratory managers and, even if full classes of CLT and CLS

students are recruited, it will not provide the number of graduates needed to alleviate the shortage.

For laboratory managers, the more immediate challenge is to retain staff, particularly the younger professionals, while recruiting qualified professionals to their institutions from those entering or already in the workforce. The benefits of retaining staff include:

- reduced training time, higher quality work, and hence, greater productivity,
- established and effective relationships among staff members that contribute to better working conditions and further encourage retention,
- cost savings through lower recruiting and training costs, and
- improved recruiting as prospective employees recognize a quality work environment.

LITERATURE REVIEW

In addition to the wage and vacancy surveys conducted every two years by the American Society for Clinical Pathology (ASCP) that document the shortage of laboratory professionals, the literature contains many reports addressing employment satisfaction and retention in the clinical laboratory. Factors contributing to job satisfaction of healthcare professionals include worker input to decisions, a safe and clean work environment, satisfaction with the work, good management, fair salary, and benefits.[7] In 1989, Karni and Feikert summarized the research findings from 1970 to 1985 on clinical laboratory scientists' (CLSs) job satisfaction.[8] Limited opportunity for upward mobility and low pay were frequently mentioned as causes of dissatisfaction. From their study of laboratory managers, Karni and Feikert concluded that job satisfaction for CLSs required more opportunities for career advancement, increased salaries, a variety of duties, and control over one's work methods and pace.

Several reports have included estimates of the level of job satisfaction in laboratory personnel. A study by Harmening in 1994 reported that over 75% of practitioners in a ten-year retrospective study of medical technologists were satisfied with their jobs.[9]

A survey of women in the laboratory profession in 1992 reported that 78% were 'satisfied' and 9% were 'extremely satisfied' with their careers as laboratorians.[10] In the mid-90s, a survey by Maher found that 87% of laboratorians were at least somewhat satisfied with their positions.[11] In Maher's survey, however, more than 50% of respondents reported that they had considered a career change and more than 60% would not advise young people to enter the profession.

Studies on the retention of laboratory personnel have focused on the causes of employee attrition and strategies to promote retention. A report by Hallam in 1990 listed low salaries, burnout, and stress as the major reasons laboratory personnel left the profession.[12] In a study of 1905 CLS graduates from the University of Minnesota, about 10% were inactive and 20% were retired, but an additional 40% had left the field, most often for family responsibilities.[13] Other frequently cited reasons for leaving were returning to school, low wages, inadequate advancement opportunities, and lack of recognition.

Most articles on employee retention stress the importance of improving salaries; however, salary data for laboratory personnel document slow and minute progress in this area. Guilles and Lunz reported that, in 1992, salaries for CLSs were lower than salaries of nurses, physical therapists, occupational therapists, and teachers.[14] According to the Bureau of Labor Statistics 2002 National Occupational Employment and Wage Estimates, the estimated mean salaries for clinical laboratory technologists and technicians were $43,670 and $30,330 respectively.[3] Comparison with other healthcare professions indicates that salaries in the clinical laboratory are still lower than many healthcare professions including nursing ($49,840) dental hygienists ($57,790) and nuclear medicine technologists ($52,260). A study by Estry showed that salaries for CLTs and CLSs just kept pace with inflation between 1979 and 1989.[15] A comparison of current salary figures with those 1989 salaries indicates that this is still the case. There have been no real gains in salaries for CLTs and CLSs since 1979 other than inflationary adjustments.

The relationship between job satisfaction and employee retention was analyzed by Lunz in a report of a longitudinal study of CLSs.[16] This study categorized respondents' commitment to a laboratory career using a seven-item survey and most respondents demonstrated moderate commitment. The study also surveyed the respondents' satisfaction with employment benefits and found that those with the highest career commitment were also the most satisfied with their benefits. However, even those who were most committed were not very satisfied with their benefits. Blau analyzed this same data from a different perspective.[17] They separated employment benefits into two groups: basic, e.g., sick leave, retirement, life insurance; and career enrichment, e.g., continuing education, flexible work schedules, reward for advanced degrees. They were able to show that, though related, the satisfaction with these types of benefits can be distinguished. Analogous to Herzberg's distinction between hygiene and motivation factors, basic benefit satisfaction may keep employees from leaving their jobs, but career enrichment satisfaction is needed to get employees to commit to an organization.[18]

This current study was conducted to focus on factors contributing to retention of laboratory personnel in the clinical laboratory at this time. CLT and CLS practitioners who had five or more years of experience were selected and surveyed to assess their views of their work, the reasons they stay in the profession, and the factors that they think are important for employee retention. Professional fundraisers have known for years that donors who have contributed money in the past are likely to give money again. So, fundraisers pay a great deal attention to donors who contribute on a regular basis. Similarly, surveying practitioners who have made a commitment to their careers in CLS may lead to a better understanding of how to instill commitment, thus leading to better retention.

MATERIALS AND METHODS

The researchers prepared a survey, list of definitions, and cover letter for clinical laboratory practitioners with questions based on a review of the literature on retention of laboratory staff. It included a set of 30 Likert–style statements designed to ascertain the opinions of the practitioners about their work and jobs (Table 1). Statements were phrased in the positive and negative to insure that subjects read each question carefully. Respondents were asked to indicate their views using the scale SA = strongly agree, A = agree, D = disagree, SD = strongly disagree.

The survey included demographic questions on practitioners' geographic location, type of work facility, size of institution, primary job function, gender, ethnicity, highest degree, certification, and hours of continuing education attended each year. To group geographic locations, the American Society for Clinical Laboratory Science (ASCLS) regions were used. Participants were asked to indicate their level of satisfaction with their choice of a clinical laboratory career and the percentage of time they devoted to various tasks such as test performance and attending meetings. To assess factors related to retention of laboratory personnel, practitioners were also asked to indicate why they left their last job, what factors keep them in the profession, and their career goals. For each of these questions, the participants could chose from a list of options provided on the survey and write in additional comments. Finally, participants were asked to write their answer to the question, "What factors do you think are most important in retaining qualified clinical laboratory practitioners in the laboratory today?"

The survey, cover letter, and definitions were reviewed by an advisory board comprised of laboratory managers, practitioners, and educators. The survey distribution model was to send the survey to laboratory managers with the request that they distribute the surveys to five practitioners who had been working in the laboratory field for five years or more. This same distribution model was used to pilot test the surveys, cover letters, and definitions. The managers selected for pilot testing were a convenience sample of individuals 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 Association (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 of the managers were selected for the final mailing with the potential for responses from 4000 practitioners. The surveys were sent in March 2003, with instructional cover letters and postage-paid return envelopes addressed to the researcher. Two weeks after sending the manager packets, a follow-up reminder postcard was sent to all managers receiving the survey packets.

DATA ANALYSIS

SPSX 11.5 was used to analyze the data collected in this study. Practitioners were defined as respondents with a primary job title of CLT or CLS and five or more years of experience. The frequency of the practitioners' responses to each item was tabulated. For the 30 Lickert-type items addressing practitioners' opinions on their work, the percentage of responses in each category (strongly agree, agree, disagree, and strongly disagree) was tabulated. To analyze the data, the percentage of responses in the agree and strongly agree categories were combined into one 'agree' category and the percent of responses in the disagree and strongly disagree categories were combined into one 'disagree' category.
The means, ranges, and standard deviations were calculated for the number of hours of continuing education, years of experience, percentage of time spent on tasks, and years in the current job.

Job satisfaction was measured on a scale on which 1 = very satisfied, 2 = somewhat satisfied, 3 = somewhat dissatisfied, and 4 = very dissatisfied. The means for job satisfaction were calculated and compared for respondents based on their job function, satisfaction with salary, job independence, sense of appreciation, and responsibility for CE. Job function was based on the respondents' self-identification as a CLT or CLS. Satisfaction with salary was based

Table 1. Practitioners' opinions on statements related to their work and careers (n = 599)

#	The work	% Agree†	% Disagree‡
1	I believe my work is important.	99.8	0.2
19	My work does not add much to patient care.	3.2	96.8
16	My job is different and interesting every day.	67.9	32.1
3	My work tends to be repetitive and boring.	24.9	75.1
9	I feel lucky to be able to do the work that I do.	81.3	18.7
28	I feel stuck doing the work I do.	29.1	70.9
23	I'm proud of the quality of work in our lab.	94.3	5.7
27	I worry about the quality of the work in our lab.	20.4	79.6
13	I feel that the work I do is valued and appreciated.	66.0	34.0
24	The work I do is rarely appreciated by others.	43.4	56.6
	Independence		
4	I have a great deal of independence in the work that I do.	78.4	21.6
12	I do not have independence in my job.	21.6	78.4
18	I have responsibility for the day-to-day decisions I encountered in my work.	87.8	12.2
8	My supervisor makes most of the day-to-day decisions that arise in my work.	36.2	63.8
	Environment – people and place		
11	My work environment is comfortable and safe.	84.9	15.1
22	My workplace is not comfortable and has safety problems.	13.8	86.2
25	It is a pleasure to work with my co-workers.	85.7	14.3
10	My co-workers are difficult to work with and create a negative environment.	20.5	79.5
21	My job requires me to interact with other healthcare workers a great deal of the time.	58.7	41.3
7	I rarely interact with healthcare workers outside the clinical laboratory.	40.7	59.3
	Career development and rewards		
30	I have opportunities for career advancement and promotions in my current job.	14.5	85.5
2	The opportunities for career advancement and promotion in my laboratory are very limited.	93.6	6.4
5	My employer is interested in my professional development.	55.2	44.8
17	My employer does not care about my professional growth.	44.6	55.4
15	I make a good salary.	48.5	51.5
6	My salary does not adequately compensate me for my education and work.	79.2	20.8
	Responsibility for continuing education		
26	I take the responsibility for arranging and funding my continuing education.	51.7	48.3
14	Providing and funding continuing education is the responsibility of my employer.	75.0	25.0
20	I try to stay up to date on the current legislation and regulations that apply to the clinical laboratory.	74.2	25.8
29	I rely on the laboratory management to stay up to date on current legislation and regulations that affect the clinical laboratory.	72.9	27.1

= order of statement on original survey
†Agree = % of respondents circling "strongly agree" and "agree"
‡Disagree = % of respondents circling "strongly disagree" and "disagree"

on agreement or disagreement with statement 15 (Table 2), job independence was based on respondents' agreement or disagreement with statement 4, sense of appreciation was based on responses to statement 13, and responsibility for one's own continuing education was based on agreement or disagreement with statement 26. F tests were used to assess differences in responses among groups and the level of significance was set at a p value of 0.01.

Participants' written responses to the question, "What factors do you think are most important in retaining qualified clinical laboratory practitioners in the laboratory today?" were tabulated and grouped into major categories by the researchers.

RESULTS

Response

A total of 809 surveys were returned which represents a 20% response rate if 4000 surveys were given to practitioners. Because the distribution model depended on the laboratory managers' assistance, it is not possible to know whether or not 4000 practitioners actually received the survey. There were 145 CLTs and 454 CLSs who met the definition of practitioner in this study (a primary job title of CLT or CLS and five or more years of experience). Respondents with five or more years of experience who identified their primary job as supervisor (118) or director (35) were not included in the practitioner sample; however, their responses to selected survey questions were analyzed and compared to the practitioners.

Demographic information

Practitioners came from all geographic regions of the country. The highest percentage of practitioners (17.6%) came from the ASCLS Region IV (MI, IN, OH, KY) and the lowest percentage of practitioners (2.2%) came from ASCLS Region VIII (CO, ID, MT, UT, WY). In the other ASCLS regions, the percentage of practitioners ranged from 9.7% to 15.1%.

Table 2. Job Satisfaction based on respondents' job function, satisfaction with salary, job independence, sense of appreciation, and responsibility for CE

Factor	Groups	N	Job satisfaction mean*	SD	p
Job function: CLT or CLS	CLT	145	1.73	.749	0.029
	CLS	450	1.89	.798	
Satisfaction with salary based on statement 15: "I make a good salary"	Agreed	284	1.58	.675	0.000†
	Disagreed	302	2.08	.812	
Job independence based on statement 4: "I have a great deal of independence in the work that I do"	Agreed	458	1.74	.732	0.000†
	Disagreed	125	2.25	.876	
Sense of appreciation based on statement 13: "I feel that the work I do is valued and appreciated"	Agreed	384	1.67	.729	0.000†
	Disagreed	198	2.18	.810	
Responsibility for CE based on statement 26: "I take the responsibility for arranging and funding my continuing education"	Agreed	295	1.85	.789	0.743
	Disagreed	275	1.83	.789	

* 1 = very satisfied; 2 = somewhat satisfied; 3 = somewhat dissatisfied; 4 = very dissatisfied
† Significant at $p = 0.01$

Most of the practitioners worked in hospitals or medical centers (80.4%). The next largest percentage of practitioners worked in physician office or group practice laboratories (8.4%) or reference laboratories (5.7%). A small percentage of the practitioners indicated that they worked in academic health centers (1.0%), HMOs (0.5%), or in an educational program (0.5%).

To assess institution size, practitioners were asked for the annual volume of tests performed in their clinical laboratory. Most practitioners (32.8%) were from institutions with test volumes between 100,001 - 500,000. Eighty-nine (16.6%) of the practitioners worked in institutions with test volumes between 500,001 - 1,000,000, 14.7% worked in institutions with test volumes greater than 1,000,000 and 14.9% worked in institutions with volumes less than 100,000 tests annually. Twenty-one percent indicated that they did not know the test volume in their institution.

The practitioners were primarily female (86.0%) and Caucasian (91.3%). The ethnic group selected by the second highest percentage of practitioners was Asian (4.0%). Only 2.4% of the practitioners were African American and a small percentage were Hispanic (1.5%) and Native American (0.5%).

Sixty-eight percent of practitioners listed the baccalaureate degree as their highest degree. The associate degree was the highest degree for 24.7% of the practitioners and 2.9 % of the practitioners indicated they had received a Master's Degree. Practitioners were graduates of certificate CLT programs (6.6 %), associate degree CLT programs (22.3%), hospital-based CLS programs (26.8%), and university-based CLS programs (36.6%). A small percentage of the practitioners (4.7 %) qualified for certification with work experience. The majority of the practitioners held CLS/MT certification (68.2%) and 8.1 % of those practitioners held additional credentials including CLT, supervisor, director, and specialist. Twenty seven percent of the practitioners indicated that CLT/MLT was their only credential and 0.5% held the CLT/MLT credential and a second credential as a supervisor or specialist.

Practitioners averaged 19.5 years of paid experience with a range of 5 to 44 years. They reported a mean of 11 years working in their current positions with a range of less than 1 to 39 years. Practitioners were asked whether or not continuing education (CE) was required for their current jobs and 59.3% indicated that it was. The annual number of hours of CE reported by the practitioners ranged from 0 to 120 with a mean of 13.8 hours per year and a median of 10 hours per year.

Practitioners' opinions of their work and careers

Practitioners' responses to 30 Lickert-type questions on their work and careers are shown in Table 1. Statements addressing the same issue including those worded both positively and negatively are grouped together. The statement number indicates the order in which the statements appeared on the survey.

The five groupings are practitioners' attitudes toward 1) the work they perform, 2) autonomy and independence in their jobs, 3) the work environment, 4) career development and compensation, and 5) continuing education.

Job satisfaction

Most practitioners indicated that they were either very satisfied (36.8%) or somewhat satisfied (44.5%) with their choice of a clinical laboratory career. Three percent of the practitioners indicated that they were very dissatisfied and 15.6 % were somewhat dissatisfied. The level of job satisfaction of the respondents was compared based on their job function (CLT or CLS), satisfaction with salary, job independence, sense of appreciation, and responsibility for CE. The means, standard deviations, and significance levels are listed in Table 2. Job satisfaction was significantly higher for practitioners who indicated that they made a good salary, had independence in their jobs, and felt that their work was appreciated. There were no differences in satisfaction based on job function or responsibility for continuing education.

Tasks performed

The mean percent of time that respondents spent in a variety of activities at work is listed in Table 3. For comparison, the responses of the supervisors and directors were analyzed and included. CLT and CLS practitioners spent the majority of their time (84%) performing tests and reporting results. Supervisors and directors spent more time in meetings and administrative functions.

Retention

Retention of clinical laboratory personnel was addressed in this study by collecting information on why practitioners left their last job, why they stay in their current jobs, the factors that they consider most important in retaining laboratory personnel, and their career plans for the next five years.

Why they left

When asked for the major reason they left their last jobs, approximately 24% of the practitioners indicated that this question was not applicable to them, which may mean that they haven't changed jobs. Of the people who responded to this question, the reasons they listed for leaving their last job were:

- relocation (26.7%),
- job elimination/mergers (8.2%),
- salary (7.4%),
- dissatisfaction with co-workers or management (6.8%),
- stress/burnout (5.7 %),
- lack of growth opportunities (4.8%),
- other (4.1 %),
- excessive workload or overtime/short staffing (3.8%),
- hours (3.6%),
- family obligations, e.g., child care (2.2%),
- lack of professional recognition (1.4%), and
- promotion, better job (0.7 %).

Why they stay

Practitioners were asked about the factors that keep them in the clinical laboratory profession. Respondents could circle more than one factor and could write in additional factors. Their responses, in rank order were:

- interesting work (65.2%),
- security (52.3%),
- like my colleagues (45.8%),
- good location (41.5%),
- challenging work (38.0%),
- good benefits (36.8%),
- good salary (35.6%),
- reluctance to change jobs (34.4%),
- flexible hours (30.5%),
- lack of other opportunities (25.9%),
- the work is easy for me (25.0%),
- opportunity to learn new things/professional development (24.7%),
- works well with childcare needs (12.5%),
- good administration/management (11.7%),
- adequate staffing levels (9.0%),
- other (5.0%),
- mobility (4.7%), and
- advancement opportunities (1.7%).

Table 3. Percent of time spent on tasks in work setting

Task	Percent of Time on Task			
	CLT n= 145	CLS n = 454	Supervisor n = 118	Director n = 35
Performing tests and reporting results (includes QC and QA within the laboratory)	84.5	84.1	51.5	13.1
Attending meetings with laboratory personnel in your facility	3.0	2.6	5.9	10.2
Attending meetings with non-laboratory personnel in your facility	1.1	1.0	3.6	10.8
Teaching, e.g., new employees, students, residents, continuing education sessions	3.5	4.3	6.2	6.2
Research and development / method evaluation	0.9	1.8	5.0	5.0
Attending continuing education	2.2	1.8	2.8	4.0
Human resource management, e.g., performance evaluation, position descriptions, analysis of workflow and staffing patterns	0.4	1.0	9.0	21.3
Financial resource management, e.g., budgets, test cost analysis, reimbursement requirements, materials/inventory management	0.2	1.4	9.9	22.2
Other*	3.8	2.1	5.9	7.5

* Phlebotomy, laboratory information systems, compliance activities, billing, ordering, customer service, safety proficiency testing, troubleshooting, and procedure writing.

How to retain others

The open-ended question, "What factors do you think are most important in retaining qualified clinical laboratory practitioners in the laboratory today?" generated 1900 suggestions from the 599 practitioners. The practitioners' written responses were summarized and grouped into major categories. The major categories of comments and the percent of respondents who made suggestions in each category were:

- salary commensurate with education, experience/equivalent to nursing (77.1%),
- recognition from other healthcare professionals/hospital administration (30.4%),
- benefits - comparable to nursing (19.0%),
- adequate staffing/reduced stress (18.3%),
- flexible/better hours (17.1%),
- good working conditions (12.4%),
- advancement opportunities/career ladder (12.0%),
- good management (11.0%),
- continuing education/professional development (10.6%),
- challenging/interesting/variable/responsible work (9.3%),
- praise/appreciation from laboratory management (7.8%),
- good/qualified co-workers (7.3%), and
- involvement in decision making (2.6%).

Practitioners gave specific examples of ways in which salaries needed to be improved. The most common suggestion was to establish parity with nurses but perceived inequities within the laboratory also were mentioned. These included equal pay for CLTs performing the same job tasks as CLSs and differential pay for credentialed individuals vs. those trained on-the-job. Elimination of salary ceilings was also suggested by long-term employees.

The practitioners who listed improvements in benefits as a retention factor gave examples such as increased numbers of vacation days with longevity, better healthcare benefits, job sharing options, employer-paid continuing education, and on-site day care. The latter was mentioned in connection to the employer's expectation for over-time and odd schedules. Other issues relative to scheduling were also mentioned frequently. These included flexibility in scheduling, but also the desire for no weekend or holiday work. Some practitioners commented that the lack of scheduling flexibility was tied to overall inadequate staffing.

Where they are going

To assess the likelihood of retaining this group of practitioners in the clinical laboratory workforce, practitioners were asked to identify their career goals for five years in the future. They were asked to select all the goals from a list on the survey that applied to them and write in additional goals. The practitioners' goals for five years in the future were:

- same position with additional skills and experience (55.4%),
- further education in the laboratory field (19.4%),
- retirement (16.1%),
- laboratory supervisory/management position (14.8%),
- leave laboratory field entirely (13.7%),
- further education in a non-laboratory field (12.9%),
- technical position in a different institution (8.7%),
- quality assurance position (3.9 %),
- research position (3.9%),
- information systems position (3.5 %),
- other (3.4%),
- clinical trials/pharmaceutical industry position (2.7 %), and
- sales or marketing (2.5%).

The practitioners who selected 'other' wrote that their goals included forensics, regulatory inspector, working part time in the laboratory, and teaching. The 13.7% of practitioners who said they were leaving the field entirely listed a number of reasons including changing to another health profession, meeting family obligations, going into business, and teaching. Some said they were not sure, but they wanted to find something with better salary and advancement opportunities.

DISCUSSION

The practitioners in this study felt strongly about the value of their work. The Lickert statement with the highest percent of agreement was #1, "I believe my work is important". This strong sense of the value of the clinical laboratory may have helped these practitioners persevere in the profession when other factors such as salary, over-work, or lack of appreciation caused them to question their commitment. Maintaining a sense of the importance of one's work can be difficult in large, computerized, highly automated laboratories in which practitioners do not collect samples, report results verbally to attending staff, or otherwise interact with providers or patients. As one respondent observed, "Working in our lab has become like working in a factory. At times I feel like a robot packaging answers to be zapped through the computer to another planet. Surely work could be made more fulfilling."

In this study, over 78% of the practitioners agreed with two statements indicating that they had independence in their work. It was interesting to note that those who felt they had independence in their work were also significantly more satisfied with their choice of CLS as a career than those who did not feel they worked independently. This is consistent with Blau's work on career enrichment factors and Karni and Feikert's recommendations for improving job satisfac-

tion.[8,17] The degree to which individuals can make decisions about sequencing work, selection of tasks, reporting of results, timing of breaks, etc. would be expected to contribute to job satisfaction and by extension, retention in both the job and the profession.

Between 56% and 66% of the practitioners agreed with statements indicating that their work was appreciated. Those who felt their work was appreciated were also significantly more satisfied with their choice of CLS as a career than those who did not feel their work was appreciated. However, 34% to 44% of practitioners did not feel appreciated. In written comments, practitioners listed recognition from individuals outside the laboratory as the second most important factor in retaining laboratory personnel, after salary improvements. It is informative to note that recognition and appreciation from patients and the public were rarely mentioned by the respondents in this study. Rather, practitioners wanted recognition from hospital administrators and other healthcare workers in their institution. Some comments reflect the practitioners' belief that the administration does not value them equally with other professions and that their lower salaries confirm that belief. For example one respondent wrote, "Treat us like we are an important part of the hospital community instead of the orphans of the organization." Another stated, "Administration – as long as we get the work out, they don't care how understaffed or underpaid we are compared to X-ray personnel and nursing staff." Physicians and nurses were most frequently listed as groups who do not value the work of laboratory professionals. One respondent wrote "most people including nurses and doctors think we are uneducated, not professionals."

Closely related to the issue of appreciation is the major issue of salaries. Slightly over half of the practitioners in this study agreed with the statement "I make a good salary" and, not surprisingly, those who agreed with this statement were more satisfied with their career choice than those who disagreed. However, 79% of the practitioners agreed with the statement "My salary does not adequately compensate me for my education and work" and salary was listed as the most important factor in retaining laboratory personnel. Dissatisfaction with salaries was seen in statements such as, "My starting pay was only $8.50 and now after 5 years is $11.62. We work very hard but factory employees (such as my husband) who didn't go to school are making $13.00 an hour… It makes me consider changing jobs even though I enjoy microbiology with a passion."

Also in written comments, practitioners adamantly assert their comparable worth to nurses citing the value of their work and the extent and demand of their education with comments such as, "I find it troublesome that we continue to see nurses, who have the same education as med techs, making far more for salaries and recognized more for the work they do." Although nurses were the most common reference group mentioned, other health professionals were also used for comparison. Examples of written comments include, "Currently laboratory salaries are 35% lower than radiology" and "I have a four-year BS degree and make less than some of the radiology techs who hold only an AA degree."

Practitioners' written comments addressed other salary issues including intra-laboratory salary inequities, salary ceilings, lack of annual raises, and lack of recognition for additional education or responsibilities. CLT respondents expressed dissatisfaction when the pay scale differentiates based on education and preparation but the job requirements are not clearly different. One respondent said, "As an MLT in a rural hospital, I have the same job responsibilities as an MT. However, I get paid less." Another wrote, "I am an MLT-C with a supervisory position in chemistry. My responsibilities are greater than some of the MTs with bachelor degrees but my salary is much less than theirs…It's very frustrating." Salary ceilings were described as a cause of dissatisfaction by respondents in comments such as "Pay ceilings have always been very limited with insufficient reward for experience or longevity" and "Many techs reach salary max within ten years time; there's no further reward." Additional dissatisfaction was mentioned when non-credentialed individuals are paid comparably to those with professional credentials as expressed by one respondent, "I work beside co-workers that are not med techs and they make more salary than I do with 23 years of experience and Master's degree. This is just not fair!"

In spite of the general concern about appreciation by other healthcare workers and salaries, the majority of respondents felt lucky to do the work they do. Over 80% were satisfied with their choice of CLS as a career. This percent is relatively unchanged from the 1994 study by Harmening.[9] There were no significant differences in job satisfaction for respondents who indicated that they were CLTs and those who were CLSs. CLT and CLS practitioners spend approximately the same percent of their time performing and analyzing laboratory tests (84%), although there are distinctions in the types of tests that each group performs.[19,20]

Practitioners spent an average of almost 14 hours each year in continuing education (CE) activities, which is consistent with NCA re-certification requirements for continued competence.[21] Slightly over half of the respondents felt that they were

responsible for providing and funding their own CE and approximately 75% thought this was the employers' responsibility. Practitioners demonstrated that they value CE by their level of participation in CE activities, but they have mixed feelings about who is responsible for providing and funding the CE. Practitioners who felt that they were responsible for their own CE might be expected to be more committed to the profession and more satisfied with their choice of CLS as a career. This was not the case, however, because there were no differences in levels of satisfaction among respondents who said they took responsibility for their own CE and those who didn't. It is likely that the respondents' experiences of arranging and funding CE varies greatly from one institution to another making comparisons on this factor difficult. For example, an individual might be willing to pay to attend a CE program but has an employer who does not approve his or her time off to attend. This employee could have a sense of responsibility for CE and be dissatisfied.

In response to structured and open-ended questions on why they stay in their current jobs, the practitioners in this study expressed their strong commitment to the work of the clinical laboratory. Approximately 65% of the respondents stay in the field because the work is interesting. Other important factors in retaining these practitioners were job security, good relationships with colleagues, and a good location. Job security was probably very important because of the current economic climate in which many people are unemployed or underemployed. Approximately 37% of the respondents indicated that they considered 'good benefits' important in retention. As one respondent observed, "My salary has not kept me where I am. It is the benefits." Another noted, "Our hospital has a very nice paid-time off policy. To move to another job would result in losing the five to six weeks of paid time off I've accumulated. That's a real benefit I do not want to lose."

At the bottom of the list of factors that respondents considered important for the retention of laboratory personnel were "praise/appreciation from lab management", "good/qualified co-workers", and "involvement in decision making". It is doubtful that these are truly considered unimportant because several were cited in prior studies as important to retention.[22] It is more likely that these are factors that are commonly present and hence may be taken for granted. For example one respondent wrote, "My manager has always listened to my concerns – no matter what they are – she has always made me feel appreciated and invaluable. Knowing I have the support of my manager and co-workers really goes a long way." Involvement in decision making was probably not a concern for this group of respondents because 88% agreed with the statement "I have responsibility for the day to day decisions I encounter in my work." However, when one of these factors was missing, the respondents expressed their concern. The lack of good/qualified co-workers was mentioned by several respondents in comments such as "There are problems with less (or minimally) competent employees being retained due to shortages in the field. This also adds additional burden to the competent employees" and "I would rather work short staffed than have our manager hire 'a warm body'. The poor work being turned out is a reflection on us all and gets very frustrating, especially when you are constantly covering mistakes."

The major reason that these practitioners left their last job was relocation. This is not unexpected given that one of the attractions of a career in CLS is that one can move and find work in another setting. This is also consistent with Harmening's study in which 35% of the respondents said that the major reason for seeking new employment was geographic relocation.[10] Some turnover due to relocation is inevitable. While this may leave one employer with an open staff position, it may benefit an employer in a new location. However, this becomes a high risk time for the retention of an individual in the clinical laboratory profession. Some individuals may leave one location with the intention of looking for a laboratory position in the new location, but during the job search they may find something outside the laboratory profession.

The majority of those surveyed plan to stay in their current positions and many respondents were thinking about future education in a laboratory field, a new position in a laboratory, a new role as a supervisor, or a new laboratory-related career in quality assurance, research, or information systems. This is good news, showing that most of these practitioners of five years or more are either satisfied where they are or are looking for career development within the profession. A survey of less tenured employees may show a higher percentage considering leaving the profession.

Still of concern is the number of people who may be leaving the profession due to retirement or dissatisfaction. Approximately 16% indicate that they plan to retire and approximately 14% said they planned to leave the field entirely. So, in this group of practitioners, an estimated 30% will be leaving the profession. Replacing almost one-third of the clinical laboratory workforce is a daunting prospect and will only support the status quo, not the predicted needs for the future. While automation and productivity improvements can compensate for some of the future personnel needs, it is clear that more people need to enter and remain in the laboratory profession.

LIMITATIONS

In this study, practitioners were defined as CLTs and CLSs with five or more years of experience. Of the 809 surveys received, approximately 600 practitioners met these criteria. The survey had the potential of reaching 4000 practitioners, however, this depended on the participation of laboratory managers. The actual response rate may be higher, but this cannot be known because the number of surveys actually given to practitioners is unknown. Although the overall response rate of 20% appears low, it is comparable to other national unsolicited surveys of the clinical laboratory population.[19] The demographic information reported in this study, which is consistent with other descriptions of the profession, and the broad geographic distribution of the participants contribute to the validity of the results.[20] This population of CLT and CLS practitioners with five or more years of experience was selected to represent those who have made a commitment to the profession. The findings should not be generalized to the total population of laboratory professions. For example, although over 80% of the respondents were satisfied with their choice of CLS as a career, it is likely that job satisfaction results would have been different if the survey population included all clinical laboratory practitioners. Those who are most dissatisfied with their choice of CLS as a profession might be expected to leave before five years of employment.

RECOMMENDATIONS TO MANAGERS

What can managers learn from the results of this study? Committed laboratory professionals stay because they like the work they do and they know the value of that work for patients. They wish others, especially physicians, nurses, and administrators, understood the importance of their work and their professional skills. Laboratory mangers should emphasize, highlight, and display the value of laboratory work, both to laboratory staff and to the other healthcare providers and administrators in their own institution. For example, laboratory managers could:

- promote greater involvement of laboratory professionals in hospital-wide issues and problems,
- target other healthcare professionals within the institution during national medical laboratory week rather than the public,
- undertake efforts to educate institutional administrators about the value and quality of laboratory services and the education of laboratory professionals, and
- find examples of laboratory services that made a difference in a patient's life or in the functioning of the institution. Then promote it and celebrate it within the laboratory and institution-wide.

Salary is an indicator of how important the individual is to the institution and it contributes to job satisfaction and retention. Laboratory managers should work to improve salaries and eliminate the disparity between the salaries of laboratory employees and healthcare workers with similar education. Often compensation specialists collect information on salaries of laboratory professionals at comparable institutions when making salary adjustments. This study indicates, that in the view of practitioners, the comparison group should be the healthcare providers in their own institution, particularly nurses. Laboratory managers must make the case within their own institutions that comparison of laboratory salaries across institutions may attract job seekers in the short term, but it does not contribute to retention within the clinical laboratory over the long term. Laboratory managers should also work with their administrators to develop strategies to minimize salary ceilings. Within the laboratory, managers should address intra-laboratory pay scales and ensure that they are commensurate with job responsibilities and that job responsibilities are commensurate with education.

Good benefits and job security are important retention factors for laboratory professionals. If an institution has a good benefits package, laboratory managers should emphasize that in communications with employees. A benefits package that is not comparable to other healthcare workers in the same institution or not competitive with other institutions increases the likelihood of attrition. As with salary, comparability of benefits to other hospital employees is important in communicating the institution's appreciation for and value of the employees.

A good relationship with co-workers is an important factor in employee retention and so the time that laboratory managers take to address problem employees and hire good employees is well spent. In addition to good working relationships, this study reinforced the importance of independence and autonomy in job satisfaction. Employers should look for ways to give employees more control over their time and work.

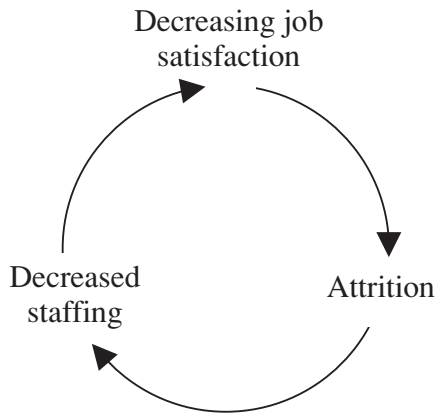
Some employee turnover is inevitable, but employers can help retain individuals in the laboratory profession by giving departing employees information about institutions in their new location and contacts with laboratory managers in that area. Finally, laboratory managers must help with the recruitment of young people into the laboratory profession by supporting the recruitment efforts of educational programs and serving as clinical sites for students.

CONCLUSION

The findings in this study are consistent with prior reports addressing job satisfaction and retention of staff. Two major

factors were identified in this study that contribute to dissatisfaction with careers in the clinical laboratory and undermine retention efforts. The first is salary. Although salaries have risen with inflation, laboratory employees feel that salaries are not commensurate with their education and experience, and they are not comparable to other healthcare providers with similar education. Second, laboratory professionals feel their work is not appreciated by administrators, physicians, and nurses. These factors along with other causes of dissatisfaction create a cycle of attrition, staffing shortages, and further dissatisfaction (Figure 1). Efforts to retain laboratory staff members by addressing the root problems of salaries and appreciation by healthcare providers outside of the laboratory are needed to stop this cycle. Laboratory managers and professional associations should incorporate these findings into their strategic planning in order to address the shortage of laboratory professionals now and in the future.

Figure 1. The attrition cycle



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