

Nuclear Medicine Technologist Job Satisfaction

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The Nuclear Medicine Technology Certification Board (NMTCB) recently conducted a membership survey designed to assess the state of the profession. While the majority of the survey questions were focused on obtaining salary and other compensation-related data, several of the items were designed to assess nuclear medicine technologists (NMT) job satisfaction. The vast research-supported literature on this subject finds strong links between measures of job satisfaction and employee productivity (1), burnout (2,3), absenteeism and turnover (4,5), retention (6), employee safety performance (7), and even the quality of patient care (2,8). All of these variables greatly impact organizational effectiveness. Therefore, understanding NMT job satisfaction/dissatisfaction, and its possible causes, would seem to be an important step in fighting the manpower shortages the profession is currently experiencing.

Although a small number of job satisfaction studies have been conducted in related fields (radiographers, radiology/nuclear medicine physicians, nursing), no survey of this magnitude has been done using the practice of nuclear medicine technology as its sole focus. Surveys were mailed out to all 14,754 NMTCB certificants (CNMTs) working in the United States and Canada and 5,153 of those surveys were returned yielding an excellent response rate of 35%. Respondents identified themselves as staff nuclear medicine technologists on 4015 (78%) of the returned surveys. The remaining 22% were a mixture of those working in non-technologist positions (administrators, educators, private sector positions) and those who did not choose to identify their current employment category. Of the staff technologist respondents who also identified their employment status, 84.5% were full-time employees, and 15.5% were part-time. Of the part-time staff, 98% of technologists were female, whereas 59.4% of the full-time CNMTs were female.

The Concept of Job Satisfaction

Job satisfaction can be viewed as either an independent or dependent variable. According to the research, job satisfaction is dependent on the complex interaction of several factors. The most often mentioned of these factors include the characteristics of the individual (his or her values, in-

terests, needs, attitudes), the characteristics of the organization (reward practices, physical work environment, peers, immediate supervisor), and the characteristics of the job itself (types of intrinsic rewards, the degree of autonomy, the amount of direct performance feedback, the variety of tasks) (9,10). It is felt that the manipulation of these variables can improve or diminish an employee's level of job satisfaction. As an independent variable, increasing the level of employee job satisfaction has been found to increase productivity, the quality of work, and retention rates while decreasing absenteeism, turnover, and burnout. Decreasing the level of satisfaction produces the opposite effects.

Many believe that job satisfaction should not be simply viewed as a single dichotomous variable with job satisfaction on one end of a continuum and job dissatisfaction on the other. Much of the research supports Frederick Herzberg's contention that the concept should be analyzed in terms of 2 separate factors, which he called "satisfiers" (or motivating factors) and "dissatisfiers" (or hygiene factors) (11,12). In his view, one continuum ranges from "not satisfied" to "satisfied" and the other from "dissatisfied" to "not dissatisfied." Generally, satisfiers are viewed as being associated with intrinsic motivators while dissatisfiers are associated with external factors. According to Herzberg, dissatisfiers include salary, working conditions (including relationships with peers and supervisors), and company policy. Satisfiers include achievement, recognition, responsibility, and advancement.

When applied to measures of retention, it is felt that people leave jobs because of issues related to dissatisfiers and stay because of the issues related to satisfiers. For any given person, it is the balance of these 2 parameters that will determine whether to remain with an employer or seek another position elsewhere. Herzberg's philosophy suggests that managers who are truly concerned with employee turnover and retention should work to involve their staff in the decision-making process of routine operations and should structure an environment that provides more personal autonomy, timely and constructive feedback, and schedules which allow staff an opportunity to perform several different tasks. They should also work to provide competitive salaries, a secure and supportive work environment (both physically and socially), and opportunities for advancement. Obviously, this is easier said than done especially with the constraints placed on the healthcare environment today.

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Since every individual has different wants, desires, and views of what's important, an employee's assessment of work-related characteristics is extremely subjective and thus difficult to predict. Surveys such as this one can only provide a starting point in the analysis of any specific set of circumstances. Routine institution-level job satisfaction surveys would provide managers with group- and individual-specific information.

Data Analysis

All returned surveys were scanned using a bubble-sheet scanner and coding software. The output data was converted to a Microsoft Excel file and analysis of the data was performed using Excel database functions. All entries in the database were evaluated for errors and completeness. Mis-codes were considered invalid responses and eliminated from the file. Blank cell entries (unanswered items) were maintained but individual records containing blank cells were not used in any analysis that required the missing data. It should be recognized that since the records used in any one specific analysis may differ from those used in another, the total number of subjects included may vary somewhat from one dataset to another. Likewise, data cross-referenced with different demographic variables may produce differing mean values for any given group of subjects. Any conclusions drawn from this data should consider the size of the sampled population.

Job Satisfaction Items

Three items were created to assess CNMT job satisfaction; one directly and 2 indirectly. The first simply asked "How satisfied are you with your current job?" Subjects were asked to respond using a 7-point Likert-like scale, which ranged from extremely dissatisfied (1) to extremely satisfied (7). The center value of 4 had the heading of "indifferent" but should be interpreted as "when all things are considered, satisfaction and dissatisfaction variables balance out." It is probably safe to assume that few people are actually indifferent towards their own job satisfaction. The 2 indirect items were "Have you seriously contemplated leaving your place of employment in the last year?"

and "Have you seriously contemplated changing professions in the last year?" These were both "yes or no" questions.

When the total set of respondents was used to analyze the first item, CNMTs reported nearly an 80% satisfaction rate (see Table 1). Just under 16% said they were dissatisfied with their current job. Only 2% reported that they were "extremely dissatisfied" while 15% indicated that they were "extremely satisfied." A full 50% of the respondents said they were "satisfied." The overall mean score was a 5.34 which would indicate that the "average CNMT" reports being just over "slightly satisfied" with their current position. The median and mode, which are less influenced by outliers, would suggest that the average CNMT is clearly "satisfied."

When only staff technologist data is used (the responses of administrators, educators, temporary technologists, and self-employed were removed), the reported levels of job satisfaction decreased only slightly (see Table 2). The percentages in the dissatisfied categories were nearly identical. The differences were in the satisfied categories—the removed group reported relatively higher scores that brought the percentages up 1 or 2 points. This difference is also reflected in the slightly higher mean value for the total-respondent group. The median and mode scores were exactly the same for each group.

It appears that CNMTs are a fairly satisfied lot. Just over 1 in 10 CNMTs are dissatisfied with their job and most of those individuals are only mildly dissatisfied. In order to understand whether an 80% satisfaction or a 16% dissatisfaction level is high or low, typical or unique, this value must be compared with previous CNMT measures or, in the absence of such information, that of other similar professions. Since this is the first NMTCB study of this kind, there are no previous samplings. The comparison with other professions is difficult and problematic because of the differing methods used to obtain, analyze, and report job satisfaction results from one study to another. Some recent articles report information that might provide some insight for comparison. One 1987 study of radiologic technologists

TABLE 1
Satisfied with Current Job (All Respondents)

	Score	#	%		
Extremely Dissatisfied	1	95	2%	Total Dissatisfied	811
Dissatisfied	2	297	6%		
Slightly Dissatisfied	3	419	8%		
Indifferent	4	232	5%	Total Satisfied	4088
Slightly Satisfied	5	774	15%		
Satisfied	6	2554	50%		
Extremely Satisfied	7	760	15%		
Total		5131			
Mean Score	5.34				
Median Score	6.00				
Modal Score	6.00				

TABLE 2
Satisfied with Current Job (Staff Technologists Only)

	Score	#	%		
Extremely Dissatisfied	1	81	2%	Total Dissatisfied	16.7%
Dissatisfied	2	227	6%		
Slightly Dissatisfied	3	338	9%		
Indifferent	4	183	5%		
Slightly Satisfied	5	674	17%	Total Satisfied	78.5%
Satisfied	6	1855	48%		
Extremely Satisfied	7	499	13%		
Total		3857			
Mean Score	5.24				
Median Score	6.00				
Modal Score	6.00				

(RTs)(13) reported that 86% of those surveyed indicated that they were satisfied with their jobs while a 1998 study (14) which focused on RTs working in mammography reported a satisfaction rating of 83%. A 2002 study of the nursing profession reported job dissatisfaction ratings ranging from 23% for nurses who work in hospitals with 8:1 patient-to-nurse ratios to 15% for nurses dealing with 4:1 ratios (2). A recent study of radiologists (including nuclear medicine physicians) reported a 65% satisfaction rating (15). A study of primary care physicians reported dissatisfaction rates of 8.8% to 34.2% depending on the location of their practice (16). On a not particularly encouraging note, one study of lawyers, an occupation known for its high incidence of burnout and attrition, reports numbers very similar to those found in this study (81% satisfied, 15% dissatisfied) (17).

It seems an 80% job satisfaction rate may be about what we might expect for a healthcare profession such as nuclear medicine technology, especially when looking at a point in time when the job market is so volatile. Job satisfaction should ideally be measured using longitudinal methods so that the direction and magnitude of change over time can provide a clue as to what these numbers truly mean. It is when used in conjunction with other collected information that job satisfaction levels become most useful. The correlation between job satisfaction scores and other job-related factors (e.g., satisfaction with salary or relationship with supervisor) can provide valuable information which can shed light on which actions might be taken to improve satisfaction which, in turn, might improve recruitment, retention rates, and absenteeism.

The results associated with the 2 indirect satisfaction questions can be seen in Tables 3 and 4. Nearly 60% of those who responded to this survey considered leaving their place of employment and 35% thought about changing careers completely. Of those who answered both questions, 30% answered "yes" to both and 34% answered "no" to both. While 31% indicated "yes" to the first question concerning leaving their current position and "no" to the second question about completely leaving the profession, only 6% responded with the opposite pattern. These observations

suggest that, even though 80% of CNMTs report that they are satisfied with their job, there are factors in play that might still influence employees to leave their current positions. Only one third of the respondents *had not* considered leaving their job (or the profession) in the year before the survey. The assumption with this group would be that these people were at least satisfied enough to not be thinking about leaving. Just less than one third of the respondents had not only considered leaving their current job, but also the profession entirely. The shortage of technologists and other market forces (e.g., the introduction of PET into the mainstream, the expansion of nuclear medicine practice into private practice offices) has increased the number of available NMT positions in recent years and the resultant increase in salaries offered would be one possible explanation for the high number of people considering leaving their current position. The concern about leaving the profession is a bit more problematic. If anywhere close to 30% of the workforce left the field in the next few years, the manpower shortage will dramatically increase in severity.

As before, there are no real differences between the percentages calculated using only staff technologist data

TABLE 3
Have You Seriously Contemplated Leaving Your Place of Employment in the Last Year?

All Respondents		
	#	%
Yes	2994	58%
No	1943	38%
NA	182	4%
Total	5119	
Staff Technologists Only		
	#	%
Yes	2171	59%
No	1391	38%
NA	112	3%
Total	3674	

TABLE 4

Have You Seriously Contemplated Changing Professions in the Last Year?

All Respondents		
	#	%
Yes	1798	35%
No	3249	63%
NA	73	1%
Total	5120	

Staff Technologists Only		
	#	%
Yes	1248	34%
No	2379	65%
NA	46	1%
Total	3673	

and those using the full dataset. The fact that the addition of administrators and educators to the pool fails to change the percentages much suggests that the reported levels of job satisfaction may have little to do with whether or not a CNMT works directly with patients or not. Differences between individual job categories will be discussed in the following section.

Satisfaction by Job Classification

The NMTCB survey form asked respondents to identify their primary job classification from several listed categories. The responses of CNMTs who identified themselves as no longer working in nuclear medicine or working the

private sector in nontechnologist positions were not used for this analysis. The results of the questions “How satisfied are you with your current job?”, “How satisfied are you with your current place of employment?”, and “How satisfied are you with your current salary?” broken down into specific job classifications are presented in Tables 5, 6, and 7 respectively. All 3 of these questions used the same 7-point Likert-like scale discussed earlier. The average scores were used to rank each job classification.

The most satisfied CNMTs are those techs working in PET (both in private offices and for private mobile imaging services), program directors, and the self-employed techs. All 4 groups had average scores above 6 (clearly in the “satisfied” category). Although this information is not presented in the table, it is interesting to note that none of the individuals in these 4 categories rated their job satisfaction as “dissatisfied” or “extremely dissatisfied.” The most dissatisfied group was also the largest group—those individuals working in hospital-based, general nuclear medicine clinics. Twenty percent of this group placed themselves in a dissatisfied category (3% extremely dissatisfied, 7% dissatisfied, and 10% slightly dissatisfied).

As a group, PET techs scored higher than cardiac techs, who in turn scored higher than general imaging techs. Mobile techs scored higher than nonmobile, and techs working in private clinics were, on average, more satisfied than those working in hospital settings.

Although further research is needed, one could suggest several reasons why we see this particular pattern in the job satisfaction data. Four are suggested here (keeping in mind that job satisfaction is a function of many interacting variables making it nearly impossible to isolate the absolute

TABLE 5

How Satisfied Are You With Your Current Job?

	Average Satisfaction Score	#	Average Annual Salary		Average Satisfaction Score	#
PET—Private Office	6.07	28	\$54,229			
Program Director	6.07	45	\$53,830			
Mobile PET—Private MIS	6.03	30	\$54,439			
Self-Employed	6.03	40	\$71,035			
Cardiac—Private Office	5.85	640	\$49,787	PET	5.87	93
Temp Staff Agency	5.83	120	\$60,641	Cardiac	5.45	866
Classroom Instructor	5.76	21	\$64,194	General Imaging	5.18	2752
Mobile PET—H/C base	5.71	7	\$51,385			
Specialty Supervisor	5.69	192	\$53,151			
PET—HB	5.66	28	\$49,666			
Chief Technologist	5.37	895	\$53,525	Mobile (all forms)	5.58	116
Administrator	5.33	89	\$64,913	Nonmobile	5.28	3651
Mobile NM—Private MIS	5.32	56	\$46,611			
Clinical Instructor	5.27	30	\$48,084			
Mobile NM—H/C base	5.26	23	\$49,986	Private Clinic	5.68	946
Research	5.17	53	\$49,873	Hospital	5.24	2649
General Imaging—Private Office	5.12	278	\$47,718			
Cardiac—HB	5.05	226	\$47,079			
General Imaging—HB	5.02	2395	\$45,791			
Grand Average or Total Number	5.28	5,196	\$49,261			

influence of just one). First, when looking at the nature of the jobs listed at the top of the list versus those at the bottom, one of the apparent differences is in the degree of autonomy individuals have in their job. Individuals working in positions scoring high on this list have a relatively high degree of control over their environment and personal schedules. Those working in positions low on the list typically have their environment structured for them by others and often with little input. Another factor that could be coming into play here is call. As one moves up the job satisfaction list, it is less and less likely that their position would include having to take call. Salary could be another primary explanation for these differences. Those at the top generally have higher salaries than those at the bottom although the highest average salaries are found towards the middle of the rankings. Lastly, we must consider the possibility that there is just something about the jobs at the top of the list that attract the type of people who are generally more satisfied with everything (their job, the personal life, the world in general). If a “general satisfaction tendency” personality trait does account for much of the variance in this study, it would imply that a person might not improve their personal career satisfaction by simply moving out of the hospital setting and into the clinic setting or by taking a position in PET, cardiology, administration, or education. Regrettably, an item addressing overall personal satisfaction with life was not included on the survey form. That may have provided some insight into whether this is indeed the case.

The results seen in Table 6 suggest that there is more to job satisfaction than just institutional factors. In every category, satisfaction with the employer was rated lower than satisfaction with the job. With a study of this size, and

because such variables tend to be normally distributed, the characteristics of the individual respondents are unlikely to be the most significant reason for the difference between the values in Table 5 and Table 6. These differences are more than likely the result of the intrinsic rewards provided by the job itself. The employer satisfaction pattern shows a slightly different ordering of the job categories. Not surprisingly, the self-employed are most happy with their current employers (although it is interesting that their average score still places them between “slightly satisfied” and “satisfied” rather than more towards the “extremely satisfied” pole). Their place on top of the list lends support to the notion that personal autonomy plays a large part in determining job satisfaction. The general imaging technologists are at the bottom of the list again. It would appear that something about working in the private clinic provides more satisfaction than working in a hospital as evidenced by the relative positioning of the job categories in each employment venue. The lack of call, an increase in personal autonomy, and the size of the institution (with smaller employers, an individual is more likely to be recognized as a vital part of the operation) are possible explanations for this trend.

Satisfaction-with-salary results (Table 7) show an even further drop in satisfaction ratings across the board. The self-employed technologists, mobile PET techs working from private medical imaging services, and techs working for private staffing agencies are most satisfied with their salaries. Clinical instructors are most dissatisfied with their salaries. Program directors, who scored high in job satisfaction, reported considerably less satisfaction with their salaries relative to their overall job satisfaction scores. The low average score for educators might not be all that surprising when one considers the current market environment. The

TABLE 6
How Satisfied Are You With Your Current Employer?

	Average Satisfaction Score	#		Average Satisfaction Score	#
Self-Employed	5.82	40			
Cardiac—Private Office	5.74	640			
Mobile PET—Private MIS	5.73	30			
Program Director	5.64	45	PET	5.55	93
PET—Private Office	5.61	28	Cardiac	5.39	866
General Imaging—Private Office	5.58	278	General Imaging	5.23	2752
Speciality Supervisor	5.58	192			
Classroom Instructor	5.57	21	Mobile (all forms)	5.40	116
Temp Staff Agency	5.57	120	Nonmobile	5.25	3651
PET—HB	5.45	28			
Mobile PET—H/C base	5.43	7			
Administrator	5.39	89	Private Clinic	5.64	946
Mobile NM—Private MIS	5.38	56	Hospital	5.13	2649
Chief Technologist	5.22	895			
Research	5.06	53			
Mobile NM—H/C base	5.04	23			
Cardiac—HB	5.04	226			
Clinical Instructor	4.97	30			
General Imaging—HB	4.90	2395			
Grand Average or Total Number	5.19	5196			

TABLE 7
How Satisfied Are You With Your Current Salary?

	Average Satisfaction Score	#	Average Annual Salary		Average Satisfaction Score	#
Self-Employed	5.28	40	\$71,035			
Mobile PET—Private MIS	5.23	30	\$54,439			
Temp Staff Agency	5.23	120	\$60,641			
Mobile PET—H/C base	5.00	7	\$51,385	PET	4.67	93
Mobile NM—H/C base	4.96	23	\$49,986	General Imaging	4.52	2752
Cardiac—Private Office	4.86	640	\$49,787	Cardiac	4.37	866
Classroom Instructor	4.71	21	\$64,194			
Administrator	4.71	89	\$64,913	Mobile (all forms)	4.90	116
General Imaging—Private Office	4.67	278	\$47,718	Nonmobile	4.15	3651
Speciality Supervisor	4.64	192	\$53,151			
PET—Private Office	4.61	28	\$54,229			
Program Director	4.53	45	\$53,830			
Chief Technologist	4.48	895	\$53,525	Private Clinic	4.71	946
Mobile NM—Private MIS	4.39	56	\$46,611	Hospital	3.92	2649
General Imaging—HB	4.06	2395	\$45,791			
Research	3.98	53	\$49,873			
Cardiac—HB	3.87	226	\$47,079			
PET—HB	3.83	28	\$49,666			
Clinical Instructor	3.57	30	\$48,084			
Grand Average or Total Number	4.35	5,196	\$49,261			

severe shortage of technologists has driven technologist salaries significantly upward. Many educators have witnessed their graduates being offered entry-level salaries close to or exceeding their own. The fact that program directors are dissatisfied with their salaries (relative to other CNMTs) but are highly satisfied with their jobs suggests that there are some unique characteristics of the job that are intrinsically rewarding. Further research would be needed to identify what these characteristics may be, but it is probably safe to assume that they are the same intrinsic rewards reported by educators in other fields (e.g., enjoy working with young people, seeing students learn and grow, passion for subject, collegiality, satisfaction in serving society/making a difference) (18). And, also, there is probably not a more autonomous group sampled in this study.

Those techs working in research and the specialties of PET and cardiology in hospital settings also show average scores on the dissatisfied side of the neutral point. PET and Cardiac techs working in hospitals, where they are often, if not typically, paid at the same rates as the techs in general nuclear medicine, probably suffer the effects of comparing their salaries with those of their colleagues holding similar positions in private clinics or with mobile imaging services. This finding suggests that hospital administrators might consider increasing the salaries of the staff in PET and cardiac or risk losing them.

Its interesting to note that, although the rankings in Table 7 appear to support the rather common sense observation that the more one makes, the more one is likely to be satisfied with one's salary, the correlations with the whole CNMT population do not. They show that there is absolutely no correlation (see Table 9, $r = 0.05$) between what a person actually makes and their subjective job satisfaction.

And, somewhat surprisingly, there is only a very modest positive correlation ($r = 0.15$) between a person's actual salary and their satisfaction with that salary. This seemingly contradictory evidence can be explained by the great variability of scores in the larger classification groups that is hidden when dividing the population into subsets. Apparently, there are enough people who are receiving the lower salaries who are satisfied with their job and salary and enough people who are receiving the higher salaries who aren't satisfied with their job or salary to bring the correlation coefficient to near zero. The significantly higher positive correlation between job satisfaction and satisfaction with salary ($r = 0.47$) greatly supports the notion that its not how much a person makes, but how much a person makes relative to what that person feels they should be making that influences job and salary satisfaction.

Other Satisfaction Factors

On the NMTCB survey form, questions were also asked concerning the respondent's satisfaction with their current workload, their relationship with their supervisor, their place of employment's technologist/physician, and technologist/technologist interpersonal relationships. An ordered list of the average satisfaction scores for each question can be found in Table 8. All of the average satisfaction scores to these questions were on the satisfaction side of neutral. CNMTs were most satisfied with the working relationships they have with other technologists and then with their jobs. They were least satisfied with their salary and current workload.

The correlation between the individual responses to these questions should provide some insight into how greatly each factor influences job satisfaction. The correlation coeffi-

TABLE 8
Overall Satisfaction

	Average Satisfaction Score
Tech/Tech Relations	5.56
Your Job	5.34
Tech/Physician Relations	5.27
Relationship with Supervisor	5.24
Your Employer	5.22
Current Workload	4.50
Your Salary	4.38

cients associated with these questions and the respondents' actual salary are presented in Table 9.

The highest correlation was between satisfaction with one's job and satisfaction with one's employer ($r = 0.79$). This finding provides an indication of the importance that institutional factors (external to the individual) play in establishing job satisfaction. Workload was the second highest correlation ($r = 0.55$) suggesting that a person's perception of being over (or under) worked also plays a significant role. Since workload and salary are characteristics of the institutional environment, we would expect to see a high correlation between those factors and that is indeed the case ($r = 0.52$ & $r = 0.47$, respectively). The high correlations between the respondent's satisfaction with his or her supervisor, job satisfaction, and satisfaction with the employer underscore the importance of the employee/supervisor relationship. That relationship is seen as very much a part of the institutional environment. This data suggests that that relationship is one to nurture.

Peer group relationships positively correlate with job satisfaction, as might be expected. The fact that there is only a 0.18 correlation between satisfaction with salary and satisfaction with technologist relationships suggests that these 2 factors are relatively independent and that, if there is a "general satisfaction tendency" at work, it is only modestly influential. The relatively higher positive correlations between satisfaction with salary, job, and workload and satisfaction with supervisor and physician relationships may be explained in part by a perception that one's supervisor and the physicians are more an extension of the employer than their fellow technologists.

Satisfiers versus Dissatisfiers

In an effort to identify which satisfaction-related variables might be considered "satisfiers" and which may be thought of as "dissatisfiers," additional items were included in the survey which asked respondents to rate job characteristics on the degree of whether or not they would influence them to stay with his or her current job or to leave and take another position elsewhere. A Likert-like scale was again used to rate 15 factors ranging from 1 ("The primary reason I'd leave") to 7 ("The primary reason I'd stay"). The central value, 4, was the neutral point ("Would not influence my decision one way or the other"). Factors having average scores below 4 are identified as dissatisfiers (reasons to leave) and those above 4 are satisfiers (reasons to stay). The findings from the analysis of this section of the survey can be found in Table 10. These results were produced using only technologist responses because it was felt that the profession's major concern was with technologist turnover (as opposed to administrator or educator turn-over) and that the inclusion of nontechnologist data could skew the results (for example, most educators do not take call and would probably be unlikely to leave their current job because of call issues). The technologist responses were divided into 2 groups, those who take call and those who don't. Factors that received average scores below the neutral point (dissatisfiers) are shown in bold type.

These results suggest that salary and benefits are dissatisfiers for technologists working in the current professional environment. Both groups, those who pull call and those who do not, rated these factors as reasons they'd leave their current job. This would be consistent with the Herzberg model discussed earlier in this article.

Call appeared to be to biggest dissatisfier of all. Of the 3657 surveys included in this dataset, 61.7% of respondents said they pull call and 38.3% said they did not (the responses from those who did not specify either way were not used in this analysis). The lowest average score on the chart was the call factor when rated by technologists who pull call. The fact that 94.9% of the group that said they routinely take call work in hospital-based, general nuclear medicine might also explain why the "pulls call" group also identified work hours and workload as dissatisfiers as well. The "does not pull call" group (of which only 22% worked in hospital-based general nuclear medicine) actually identi-

TABLE 9
Satisfaction Correlation Matrix

	Job	Employer	Salary	Workload	Supervisor	Tech/Physician	Tech/Tech	Actual Salary
Job	1.00	0.79	0.47	0.55	0.50	0.38	0.36	0.05
Employer		1.00	0.47	0.52	0.52	0.39	0.35	0.05
Salary			1.00	0.41	0.31	0.24	0.18	0.15
Workload				1.00	0.37	0.32	0.27	-0.02
Supervisor					1.00	0.34	0.33	0.02
Tech/Physician						1.00	0.37	0.01
Tech/Tech							1.00	0.00

TABLE 10
Job Satisfaction Factors

Factor	Pull Call	Do Not Pull Call	Difference
Salary	3.01	3.33	0.33
Benefits	3.87	3.81	-0.06
Call	2.87	4.24	1.38
Work Hours	3.97	4.72	0.75
Workload	3.54	4.17	0.62
Job Responsibilities	4.09	4.47	0.38
Patient Demographics	4.27	4.68	0.42
Specialty Practice	4.00	4.75	0.25
Educational Opportunities	3.75	4.03	0.28
Relationship with Supervisor	4.20	4.50	0.31
Relationship with Co-workers	4.70	4.89	0.19
Closeness to Family/Others	4.71	4.66	-0.04
Non-job-related-lifestyle	4.26	4.35	0.10
Climate	4.18	4.32	0.14
Locale	4.41	4.45	0.04

Note: Factors with below average scores are shown in bold type.

fied the work hours (average score = 4.72) and workload (average score = 4.17) as satisfiers (reasons to stay in their current position). When the 22% of hospital-based techs were factored out, these averages increased to 4.77 and 4.24, respectively.

The technologists who take call (again, primarily hospital-based employees) also see greater educational opportunities elsewhere as a reason to leave their current position. Those who do not, have a balanced average score (near 4) for educational opportunities.

Another interesting finding is that both groups see the relationships with their coworkers and their supervisors as primary reasons to stay with their current job. For CNMTs anyway, these factors appear to be satisfiers. The Herzberg model discussed earlier in this article had these external factors identified as dissatisfiers (because both supervisor and coworkers are considered institutional variables outside the control of the employee). These results suggest that institutional policy, for CNMTs at least, should emphasize the importance of nurturing these key relationships.

CONCLUSIONS

The findings of this job satisfaction analysis will probably not be all that surprising to anyone who has been involved in the practice of nuclear medicine technology over the last few years. It's a good bet that nearly every CNMT has at one time or another been part of conversations where the focus of discussion was on why someone was thinking of leaving their job. The professional trade publications are full of articles about the current manpower shortage, how it is effecting the ability of workers to do their jobs effectively and efficiently, and, in turn, what it is doing to individual and group morale. Speakers presenting on turnover, burn-out, and job retention have been prevalent at many of the professional conventions lately. Even though the results of

this study may not be exactly eye opening, hopefully, it can serve the nuclear medicine community by providing strong statistical support for change.

In order to improve retention rates, an institution has basically 2 options; 1) decrease the influence of dissatisfiers by trying to eliminate them or 2) sway the balance towards satisfaction by increasing the quantity or quality of the satisfiers. It appears that the market as done a fairly good job dealing with the salary dissatisfier. Salaries have increased significantly in the last few years. Hopefully, the next salary survey will show that CNMTs are a bit more comfortable with what they're making. With comfortable salaries, current employees may be less inclined to leave their jobs. However, the migration of hospital-based techs to the private clinics, or into the specialties that do not require call, is still likely to be an issue. Until the market becomes flooded with new graduates (unlikely to happen anytime soon) or hospitals address nonsalary-related reasons for leaving and staying, turnover will still be a problem for them and the staff who remain.

This study identifies at least 3 points at which to attack turnover in nuclear medicine. First, if hospitals want to increase their retention rate, they should consider doing something about callback. Anecdotal evidence suggests that call is really just an autonomy issue. It messes with people's ability to schedule their own personal lives outside of the work setting. Totally eliminating call in the hospital setting would be difficult to do with current staffing and budget constraints and, in many cases, detrimental to quality patient care. Any efforts made to minimize this encroachment on technologists' personal time might be a step towards improving job satisfaction in that arena. Creative scheduling may be an answer to relieving some of the dissatisfaction associated with being on call (for example, daily, rather than week long, call periods). Having staff take turns running a 2nd (and maybe even a 3rd) shift would free up 1st shift employees' evenings and may minimize the need for people working more than 40 hours a week.

A second area in which one might choose to address employee dissatisfaction and turnover is finding ways to increase the staff technologist's autonomy while on the job. Supervisors might consider allowing the staff to make many of the decisions and choices traditionally handled by management. Things like allowing the staff to make their own call and clinical rotation schedules may help provide some sense of ownership. Having technologist representation on any institution-based committees may be another way. Micromanaging the day-to-day operation of the department or clinic is probably something a supervisor should try to keep away from. Allowing staff time away from their routine duties to work on other self-directed projects (like research or professional writing) might add to their feeling of autonomy and self-worth, and, at the same time, benefit the department and or the profession.

The strong positive ties this analysis found between job satisfaction and positive supervisor and coworker relation-

ships suggest that these areas might also be a point of focus for improving retention rates. According to the ample research on job retention and turnover, a poor relationship with one's boss is often the main reason one leaves a job. This NMTCB study shows that the employee/supervisor relationship can also be a major reason for staying on the job. Loyalty to a supervisor may help combat any lack of loyalty to the institution itself. Institutions must provide an environment where effective managers can develop and flourish. Too often, and especially in health care, managers reach their position of authority because of their technical experience and expertise while having little previous education or experience in managing people. Educational programs in management (especially human resources and conflict management), organizational and social psychology, as well as interpersonal communications should be one of the mainstays at national and local meetings. The professional credentialing or licensing organizations should allow attendee's of these sessions to receive continuing education credit. Managerial education in the form of inservice programs may be even more valuable at the institutional level where supervisors and staff technologists can meet together to apply the principles learned to specific issues relevant to their situation. Higher-level management would need to buy into such a plan of action by seeing to it that there are resources available (e.g., time, money, and expertise) for such programs. Cultivating a positive and accepting social environment is essential for promoting job satisfaction. Policies allowing supervisors and their staff to invest some of the available resources towards nonwork-related social activities would help promote a sense of belonging and relatedness that could eventually translate into a sense of commitment to the organization. It has long been suggested that the group that plays together, stays together.

The theory is that satisfied employees will stay put. Employees who are merely "not dissatisfied" may stay . . . for a while. Dissatisfied employees need little incentive to move on. Hopefully, the results of this survey can facilitate

movement towards placing more CNMTs in the first group and fewer in the latter 2.

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