Hypothesis: Financial incentives are the only form of compensation that will motivate surgeons at an academic health sciences center to perform the tasks outlined in the hospital's mission statement.

Design: A questionnaire divided into 5 sections: demographics, compensation, time allocation, benefits and incentives, and motivational factors.

Setting: The Department of Surgery, The Toronto Hospital, Toronto, Ontario.

Participants: All academic surgeons (N=64) practicing at The Toronto Hospital in July 1997.

Results: Of the 64 eligible mailed surveys, there were responses for 59. Of these 59 surgeons, 48 (81%) receive compensation through a fee-for-service method. However, only 32 (54%) of the surgeons prefer the fee-for-service method, while 18 (31%) prefer salary and 9 (15%) prefer an alternative system. On average, these academic surgeons spend 44% of their time teaching or performing research, for which they receive 14% of their total income. Of the motivational factors assessed, financial bonuses are a positive motivational factor for all “surgeon tasks.” In addition, task-specific motivational factors were established for research, teaching, and operating, including research facilities, mentorship and prestige, and interesting case types, respectively.

Conclusions: Surgeons are not appropriately remunerated for time spent on academic activities, and many would prefer an alternative form of compensation to the fee-for-service method. Knowledge that surgeons are receptive to tasks supporting the hospital’s mission statement leads us to conclude that appropriate motivation can shape the activity of academic surgeons. Financial rewards ranked the highest as a motivational factor for all surgeon tasks; however, task-specific motivational factors were identified. Overall, multiple factors, specifically targeted to the individual, will serve to motivate. Thus, compensation packages based on individual preferences and personal motivational factors will be the most successful.

This study identifies the motivational factors that will ensure that surgeons at an AHSC perform to their maximum capability and that allow the hospital to attain its mission statement, the proposition being that financial incentives are the only motivating form of compensation. Thus, we examined several areas: the compensation methods; surgeons’ views on which methods are the most desirable; the importance surgeons place on their tasks, with the appropriate reward level; and the factors that motivate surgeons to perform specific tasks.

### RESULTS

#### VALIDITY

Independent review of the questionnaire found that it met the requirements of content validity, construct validity, and clarity; it also had no redundant items.7

#### PARTICIPANTS AND METHODS

A pilot questionnaire was developed, evaluated, and refined by 10 randomly chosen health care professionals. To ensure clarity, we presented a final questionnaire, composed of 5 sections, to the same evaluators: demographics, compensation, time allocation, benefits and incentives, and motivational factors.

#### VALIDITY

No criterion standard exists to determine the validity of a questionnaire assessing motivational factors. We thus applied the theory of clinical sensibility by asking if the instrument addressed the purpose of the study, content validity, redundancy, and clarity.7

#### PARTICIPANTS

Of all surgeons practicing at The Toronto Hospital in July 1997, 59 completed the questionnaire. Each participant (average age, 49 years) was asked to differentiate the time allocated to the 5 “surgeon tasks” such that there would be no overlap. The average number of years in practice was 17, with an average net income of Can $189,193 (range, $100,000-$450,000; median, $225,000).

#### STATISTICAL ANALYSIS

Descriptive statistical data (mean ± SD, median, mode, and range) were tabulated on the demographic data collected. Surgeons who preferred fee-for-service (FFS) compensation were compared with those preferring salary or “other” remuneration packages using t tests. Descriptive analyses and frequency tables were completed on each of the 4 questions focusing on surgeon tasks. The 4 questions on items that would motivate surgeons to complete surgeon tasks outlined in the hospital’s mission statement were analyzed descriptively and for trends.

This study identifies the motivational factors that will ensure that surgeons at an AHSC perform to their maximum capability and that allow the hospital to attain its mission statement, the proposition being that financial incentives are the only motivating form of compensation. Thus, we examined several areas: the compensation methods; surgeons’ views on which methods are the most desirable; the importance surgeons place on their tasks, with the appropriate reward level; and the factors that motivate surgeons to perform specific tasks.

### SURGEON CURRENT AND PREFERRED COMPENSATION

Of the 3 primary models for compensating surgeons (FFS, capitation, and salary), most of the surgeons (48 [81%]) received at least 80% of their remuneration via an FFS system.

Most surgeons (32 [54%]) prefer to be compensated through an FFS system compared with 27 (46%) who would prefer salary or another form of compensation (Figure 1).

### SURGEON TIME ALLOCATION

The average workweek for a surgeon at The Toronto Hospital is 64 hours, with time relatively well distributed among the surgeon’s major tasks, teaching, research, operating, clinical duties, and administration, which are outlined in Table 1. The range of hours for each surgeon task is variable, depending on research or clinical orientation.

On average, 86% of a surgeon’s income is derived from operating and clinical patient care, with 44% of a surgeon’s time spent in research, teaching, and administration, which generate only 14% of the surgeon’s income (Figure 2).

The surgeons were subdivided into 3 groups based on their preferred compensation methods (FFS, salary, or other). Of the 9 surgeons preferring other, 3 described this as a combination of salary and FFS, 3 favored a departmental practice plan, and 3 preferred a salary-with-incentive package.

Tests between each compensation method and each surgeon task were performed, testing the hypothesis that

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**Table 1. Surgeon Time Allocation**

<table>
<thead>
<tr>
<th>Surgeon Task</th>
<th>Mean ± SD</th>
<th>Median</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research</td>
<td>12 ± 12.0</td>
<td>12</td>
<td>0-40</td>
</tr>
<tr>
<td>Administration</td>
<td>6 ± 6.0</td>
<td>4</td>
<td>2-30</td>
</tr>
<tr>
<td>Operating</td>
<td>17 ± 6.5</td>
<td>15</td>
<td>10-40</td>
</tr>
<tr>
<td>Clinical duties</td>
<td>19 ± 9.5</td>
<td>16</td>
<td>6-40</td>
</tr>
<tr>
<td>Teaching</td>
<td>10 ± 8.0</td>
<td>8</td>
<td>1-25</td>
</tr>
</tbody>
</table>

**Figure 1. Preferred vs second-choice compensation method.**

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no significant difference existed between the time allocated for each surgeon \((P<.05)\). No significant difference in the total number of workweek hours was identified between each of the 3 preferences \((P=.40, \text{salary vs FFS}; P=.60, \text{FFS vs other}; \text{and } P=.77, \text{salary vs other})\).

Using the \(t\) test, we found that there was a significant difference between the time allocated for research by surgeons preferring salary vs FFS \((P=.02)\) and other vs FFS \((P=.007)\). No significant difference existed between the salary and other groups \((P=.87)\). From these data, we determined that surgeons who allot a significant portion of their time to research at The Toronto Hospital prefer salary or another form of remuneration vs the current FFS compensation method.

A significant difference existed between the time allocated for clinical duties by surgeons preferring FFS vs salary \((P=.03)\) and FFS vs other remuneration \((P<.001)\). No significant difference existed between the salary and other groups \((P=.77)\). Thus, we determined that surgeons at The Toronto Hospital who allotted more time to clinical duties prefer FFS compensation.

Each surgeon was asked to rate the importance of level of gratification derived from and level of reward for each surgeon task on a 5-point Likert scale (Table 2). These 3 ratings were closely correlated \((r=0.85)\). Operating is considered the most important task \((53 \text{ of 59 surgeons})\), while administration is considered the least important \((27 \text{ of 59 surgeons})\). Operating is the most gratifying task \((53 \text{ of 59 surgeons})\), while administration is the least gratifying \((28 \text{ of 59 surgeons})\). Finally, most believed operating should receive the greatest rewards \((50 \text{ of 59 surgeons})\), while most believed that administration should receive only moderate or low rewards \((37 \text{ of 59 surgeons})\). Evaluating the average ranking for each of these surgeon tasks, we obtained the same results: operating was the most important, gratifying, and deserving of reward.

**THE IMPORTANCE SURGEONS PLACE ON THEIR TASKS**

No significant difference existed between any of the 3 compensation groups for time allocation for operating, teaching, or administration.

**MOTIVATIONAL FACTORS TO FULFILL THE HOSPITAL’S MISSION STATEMENT**

Of the 59 surgeons surveyed, 54 (92\%) were aware of The Toronto Hospital’s mission statement.

From each surgeon’s questionnaire, trends and descriptive statistics were calculated on the 9 motivational items that focused on the hospital’s goals. We obtained a wide variation of responses, which we believe is the result of individual surgeon preferences.

Overall, financial bonuses are the primary motivational factor for the 3 surgeon tasks we evaluated (research, teaching, and operating) (Figure 3). Thus, financial incentives should be considered as key components to a compensation plan for academic surgeons at The Toronto Hospital.

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**Table 2. Importance of the Task to the 59 Surgeons**

<table>
<thead>
<tr>
<th>Surgeon Task</th>
<th>Teaching</th>
<th>Operating</th>
<th>Clinical Duties</th>
<th>Administration</th>
<th>Research</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Descriptive Statistics</strong></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Mean Question 1</td>
<td>3.7</td>
<td>4.5</td>
<td>4.3</td>
<td>2.6</td>
<td>3.6</td>
</tr>
<tr>
<td>SD Question 1</td>
<td>1.1</td>
<td>0.9</td>
<td>0.9</td>
<td>1.4</td>
<td>1.3</td>
</tr>
<tr>
<td>Mean Question 2</td>
<td>3.9</td>
<td>4.5</td>
<td>3.9</td>
<td>2.5</td>
<td>3.6</td>
</tr>
<tr>
<td>SD Question 2</td>
<td>1.0</td>
<td>0.9</td>
<td>1.2</td>
<td>1.3</td>
<td>1.3</td>
</tr>
<tr>
<td>Mean Question 3</td>
<td>3.4</td>
<td>4.6</td>
<td>4.2</td>
<td>3.1</td>
<td>3.8</td>
</tr>
<tr>
<td>SD Question 3</td>
<td>1.3</td>
<td>0.7</td>
<td>0.9</td>
<td>1.3</td>
<td>1.1</td>
</tr>
</tbody>
</table>

\* Question 1 was as follows, “How important are each of these tasks to you?”; question 2, “Which task is the most gratifying to you?”; and question 3, “What level of reward should the following tasks receive?”

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**Figure 2. Time allocation vs income.**

**Figure 3. Factors that motivate a surgeon to teach more hours.**
In addition, for individual surgeon tasks, specific motivational factors received high rankings due to their direct association with the task. To motivate surgeons to perform more research, facilities, technology, and information ranked high compared with the other factors. To motivate surgeons to operate more, case type and new technology and information access rated among the highest factors (Figure 4). To encourage surgeons to teach more, mentorship opportunities, prestige, and access to new technology would motivate (Figure 5). Thus, task-specific motivational factors for surgical staff do exist and are available to achieve the hospital’s specific goals.

COMMENT

MATCHING COMPENSATION METHODS AND HOSPITAL GOALS

Most surgeons at Canadian AHSCs are compensated through an FFS mechanism. However, this method is preferred by only 32 (54%) of the 59 surgeons at The Toronto Hospital. A significant minority of academic surgeons favor salary or other forms of remuneration.

This finding raises the issue of whether the FFS method is appropriate for an academic health center. Many of the activities essential for achieving The Toronto Hospital’s mission statement objectives are not facilitated by the FFS structure.

This study also collected data on academic surgeons’ weekly time allocation. This reveals that most surgeons are conscious of the mission statement, and are allocating time each week toward achieving the hospital’s goals. However, large discrepancies emerged when we compared time allocation with surgeon compensation. Several researchers have noted the long-term underfunding of academic activities, for teaching and research, and the disparity in compensation.

To deal with the inappropriate allocation of physician compensation to academic activities, several hospitals have implemented alternative funding plans. The alternative funding plan evaluation for the Hospital for Sick Children, Toronto, was encouraging for productivity in the areas of research, teaching, and patient care. The Hospital for Sick Children has experienced improvements in all areas relevant to the accomplishment of its goals. These results, along with the results of the present survey, indicate that an alternative mechanism for compensating academic surgeons is possible. Hospitals not compensating surgeons based on activities risk inefficiency.

INCENTIVES

Compensation is multifaceted: it includes base wages, benefits, and employee incentives. In general, surgeons receiving compensation through FFS must provide their own benefits and do not receive additional incentives. In comparison, many businesses have incorporated incentive programs into their compensation plans to achieve the highest levels of productivity from their employees.

Our study examined the importance surgeons place on their tasks, the related reward level they consider appropriate, and the motivational importance of these, considering that they do not receive incentives and benefits. Our results show that all tasks except administration are important to the staff, and that they are most gratified by these same tasks. Finally, we know that surgeons want to be rewarded primarily for patient care activities, highly for academic pursuits, and comparatively less for administrative tasks.

From these findings, the data suggest that academic surgeons can be motivated to achieve the goals
of the hospital's mission statement. Creation of a compensation program that rewards surgeons' clinical and academic tasks, with appropriate rewards for time allocation, would receive the strongest endorsement. For example, The Toronto Hospital could develop a point allocation system managed by an internal committee that distributes credits and demerits for achieving goals in each task. In addition, the allocation of income or alternative remuneration would be based on specified standards, a recommendation similarly proposed by other researchers.10, 14-17 who emphasize that flexibility and rewards must be included in compensation mechanisms for physicians.

The creation of an incentives program for academic surgeons would create external equity with other professions. Surgeons would receive compensation in a similar fashion to their professional counterparts in the business world. However, this enthusiasm must be tempered with a degree of pessimism. Unlike the business world, where capital can be increased in a free market economy, hospitals in Canada operate with a set pool of funds provided by provincial governments that are economically constrained and have shrinking hospital budgets.

MOTIVATIONAL FACTORS

The results reveal wide variations in surgeon preferences, which we believe are due to individual surgeon preferences. This is consistent with motivational theory, as stated by McCormick,13(p407) “what may be satisfying and motivating to one person may be stressful and demotivating to another.” Therefore, to construct a compensation plan that focuses surgeons on hospital objectives and keeps them working at the AHSC, individualized programs need to be created based on surgeons' preferences (teaching, research, or clinical and operating duties) and specific motivational factors. A program of this depth could only be achieved with an in-depth job analysis evaluation and the continual assessment of employee needs and motivational factors.18,19

STUDY LIMITATIONS

There are some limitations to this study. We surveyed only surgeons affiliated with 1 AHSC in Toronto. This study would have been more informative if it had contrasted surgeons with faculty at another institution. Second, all of the respondents were men, thus creating a significant sex bias. Therefore, it may not be possible to generalize our findings such that they could be applied to other institutions in other parts of the country. Third, the ability of a self-reporting survey to accurately depict complex compensation and behavioral factors is uncertain and somewhat limited.

CONCLUSIONS

The present study indicates that surgeons at The Toronto Hospital are not appropriately remunerated for their academic activities and that the perceived importance of, gratification derived from, and level of reward for each surgeon task are closely correlated. For the motivational factors that drive surgeons to perform specific tasks, financial bonuses are a key consistent motivational factor for all surgeon tasks. In addition, each surgeon task can be motivated by task-specific motivational factors.

This information, coupled with the knowledge that surgeons are receptive to tasks supporting the hospital's mission statement, leads us to conclude that appropriate motivational factors can be generated to influence academic surgeons. The conclusion that many of these factors are specific to the individual is not surprising. In the future, AHSCs should strive to create tailored surgeon compensation packages after eliciting these individual preferences.

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