Characteristics of highly successful orthopedic surgeons: a survey of orthopedic chairs and editors

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Background: Highly successful orthopedic surgeons are a small group of individuals who exert a large influence on the orthopedic field. However, the characteristics of these leaders have not been well-described or studied.

Methods: Orthopedic surgeons who are departmental chairs, journal editors, editorial board members of the *Journal of Bone and Joint Surgery* (British edition), or current or past presidents of major orthopedic associations were invited to complete a survey designed to provide insight into their motivations, academic backgrounds and accomplishments, emotional and physical health, and job satisfaction.

Results: In all, 152 surgeons completed the questionnaire. We identified several characteristics of highly successful surgeons. Many have contributed prolific numbers of publications and book chapters and obtained considerable funding for research. They were often motivated by a "desire for personal development (interesting challenge, new opportunities)," whereas "relocating to a new institution, financial gain, or lack of alternative candidates" played little to no role in their decisions to take positions of leadership. Most respondents were happy with their specialty choice despite long hours and high levels of stress. Despite challenges to their time, successful orthopedic surgeons made a strong effort to maintain their health; compared with other physicians, they exercise more, are more likely to have a primary care physician and feel better physically.

Conclusion: Departmental chairs, journal editors and presidents of orthopedic associations cope with considerable demands of clinical, administrative, educational and research duties while maintaining a high level of health, happiness and job satisfaction.

Contexte : Les chirurgiens orthopédistes qui connaissent beaucoup de succès forment un petit groupe de personnes fort influentes dans le domaine de l'orthopédie. Toutefois, les caractéristiques de ces chefs de file n'ont été ni bien décrites, ni étudiées.

Méthodes : Nous avons invité des chirurgiens orthopédistes qui sont chefs de leurs départements, rédacteurs en chef de revues scientifiques, membres du comité de rédaction du *Journal of Bone and Joint Surgery* (édition britannique) ou présidents ou présidents sortants d'associations d'orthopédie réputées à répondre à un questionnaire destiné à mettre au jour leurs motivations, leur bagage universitaire et leurs réalisations, leur état de santé émotionnel et physique et leur degré de satisfaction professionnelle.

Résultats : En tout, 152 chirurgiens ont répondu au questionnaire. Nous avons dégagé plusieurs caractéristiques propres aux chirurgiens qui réussissent très bien. Plusieurs ont abondamment publié (articles et chapitres d'ouvrages) et ont obtenu d'importantes subventions de recherche. Ils se sont dits souvent motivés par un désir de se perfectionner (défis intéressants, nouvelles possibilités), tandis que « la relocalisation vers un nouvel établissement, les gains économiques ou le manque d'autres candidats » ont joué un rôle mineur, voire nul dans leurs décisions d'accepter des postes de responsabilité. La plupart des répondants se sont déclarés heureux de leur choix de spécialisation, malgré les longues heures et le degré élevé de stress. Même s'ils consacrent beaucoup de temps à leur travail, les chirurgiens orthopédistes qui réussissent disent faire d'importants efforts pour rester en bonne santé; par rapport à d'autres médecins, ils font plus d'exercice, sont plus susceptibles d'avoir un médecin de famille et de se sentir mieux physiquement.

Conclusion : Les chefs de départements, rédacteurs en chef de revues scientifiques et présidents d'associations d'orthopédistes font face à des demandes considérables aux plans des tâches cliniques, administratives, professorales et scientifiques, tout en conservant une bonne santé et un degré élevé de satisfaction au travail.

For many of us, success is our fundamental goal. Whether it is success in our careers, our relationships or our non–career related activities, we either subconsciously or overtly strive for success. However, definitions of success are highly variable and highly personal. Sir Winston Churchill defined success as "the ability to go from one failure to another with no loss of enthusiasm." Albert Schweitzer noted that "Success is not the key to happiness. Happiness is the key to success. If you love what you are doing, you will be successful."

Understanding individuals who meet our personal definitions of success can be highly instructive, whether it is a highly accomplished athlete, an award-winning writer, a talented executive or a highly skilled surgeon. In business, the critical evaluation of successful leaders is the focus of hundreds of textbooks and other publications.[1–6] For example, about 280 books have been written on Jack Welch, the former CEO of General Electric (who was also named CEO of the century); more than 500 books have been written on the financial thinking and character of Warren Buffett, CEO of Berkshire Hathaway; and more than 700 books have been written about Bill Gates, chairman of Microsoft. Why so many books? There is an intellectual curiosity to understand what makes successful people so successful. What fundamental factors in their lives, their work habits and their general approach to life enabled their successes?

Surgeons, to a large extent, are societal examples of success, and within the surgical communities, those who rise to the ranks of department chairs, journal editors and specialty association presidents represent examples of "highly successful surgeons."[7] The challenges of such positions and the characteristics of such individuals have been raised in previous surveys;[7–11] however, quality of life determinants and predictors of career satisfaction are not well reported. We sought to examine the demographic characteristics, work–life balance, job satisfaction and motivation of highly successful orthopedic surgeons.

Methods

We conducted a cross-sectional, multinational survey of orthopedic surgeons who are department chairs, journal editors and presidents of major orthopedic associations to explore characteristics, such as personal history, academic output, work–life balance, quality of life and key motivators.

Defining success

Merriam-Webster defines success as "the attainment of wealth, favour, or eminence" where eminence is defined as "a position of prominence or superiority."[12] For the focus of our survey, the criteria for success related to the academic setting and accepted positions of prominence within orthopedics, including departmental chairperson, journal editor or current/past president of a major orthopedic association. Although other determinants of success include exemplary patient care, high-level hospital administration, research leadership and high levels of wealth from innovation in design and engineering in orthopedics, these aspects of success were not the focus of our survey.

Sampling frame

Our survey was designed to identify the characteristics of a cohort of successful orthopedic surgeons. Using the aforementioned definitions for success, we selected a representative group of "highly successful orthopedic surgeons" from among the current chairpersons of orthopedic and orthopedic subspecialty departments in the United States and Canada, editors of peer-reviewed orthopedic journals, the *Journal of Bone and Joint Surgery* (British edition) editorial board, and the current and past presidents of the American Academy of Orthopaedic Surgeons (AAOS) and the American Orthopaedic Association (AOA). Department chairpersons and orthopedic journal editors were chosen owing to their achievement of prominent positions within academic orthopedics, consistent with a high level of success. Similarly, the current and past presidents of the AAOS and AOA were selected because, in our opinion, they represent many of the most accomplished orthopedic surgeons in the United States.

Survey development

We developed a questionnaire using a focus group and an analysis of the existing literature. Orthopedic surgeons in Canada and the United States participated in the development of the questionnaire. We conducted a focus group consisting of orthopedic surgeons and investigators with graduate training in research methodology to generate items for the questionnaire based on 3 broad domains: motivation, work–life balance and job satisfaction, and academic background and accomplishments. The items generated from the focus group were augmented by the use of questions pertaining to job satisfaction and work–life balance that were used with permission from the *Physicians Practice* study, "The Great American Physician Survey."[13] The *Physicians Practice* survey was completed by a cross-section of more than 750 physicians across all specialties, with 60.2% representing primary care specialties. In this manner, we were able to compare the work–life balance and job satisfaction of highly successful orthopedists against that of a cross-section of other physicians. In addition, questions in the motivational section were influenced by the work of Gmelch and Miskin.[14]

The survey included 47 questions and was designed to be completed online in about 10 minutes. By including questions that had been used in a previous survey, we were able to make comparisons between our population of highly successful orthopedic surgeons and other groups of physicians.

We pretested the questionnaire among 3 orthopedic surgeons and 3 research methodologists to evaluate if the questionnaire adequately addressed questions of motivation, work–life balance, job satisfaction and academic background and accomplishments. These surgeons and research methodologists also commented on the clarity and comprehensiveness of the questionnaire. We revised the survey based on their comments and feedback.

Survey administration

We invited participants via an email that contained a link to the survey webpage. The first page of the survey asked participants to provide consent before continuing on with the questionnaire. Participants received up to 3 email reminders to complete the survey. The Ohio University Institutional Review Board approved our study protocol.

Statistical analysis

Data collection, recording and storage were performed on a password-protected web-based service: surveymonkey.com. We used the χ^2 test to compare our survey results with those of previous surveys of physicians. In addition, we performed a regression analysis to identify factors that predicted happiness in life, happiness with orthopedics as a career choice, and the likelihood of surgeons reporting that they were currently the happiest they had ever been in their lives. All analyses were 2-tailed, and we considered results to be significant at $p < 0.05$.

Results

Survey response rate

Out of 388 surgeons who were emailed invitations to participate in the survey, 163 began the survey and 152 completed it, representing a 39.2% completion rate. For incomplete surveys, we included completed questions in our analysis but excluded incomplete responses.

Characteristics of respondents

Most respondents (99%) were men with a mean age of 55 (range 36–77) years. Most (94.9%) were married and self-reported subspecialists in orthopedic surgery (82.4%). Surgeons reported the following areas as their primary or specialty areas: trauma (29.9%), adult knee (20.1%), adult hip (18.2%), total joint (18.2%), arthroscopy (17.5%), shoulder (17.5%), pediatric orthopedics (17.5%), hand (15.6%), sports (14.3%), pediatric spine (12.3%), orthopedic oncology (11.7%), adult spine (11.0%) and foot and ankle (10.4%).

One hundred surgeons reported serving as department chairs at some point in their careers. Forty-six surgeons reported serving as the editor of an orthopedic journal, and 79 reported having been president of an orthopedic association. Those who reported serving as the presidents or high-ranking officers of associations came from a wide range of prestigious associations, including the AAOS, AOA, Orthopaedic Trauma Association and the Scoliosis Research Society. Those who reported serving as journal editors worked on many of the most prestigious orthopedic journals, including the *Journal of Bone and Joint Surgery* (American and British editions) and Clinical Orthopaedics and Related Research.

Time to leadership position

Twenty-six (26.5%) department chairs indicated that they served in their position for less than 5 years, 36 (36.7%) served for 6–10 years, 29 (29.6%) served for 11–20 years and 7 (7.1%) served for more than 20 years. More than half (55.4%) of the department chairs reported having had only 1 orthopedic position before accepting the role of chair. In 45.0% of cases, 10–15 years elapsed between the respondent completing residency and becoming department chair, and 24.0% attained the chair position in less than 10 years. Forty-three (42.1%) of the department chairs completed their residency training in the same department they now lead. Completing residency training at the same institution was associated with a shorter time to achieve the department chair position ($p = 0.009$). In contrast, academic productivity (number of publications and book chapters) and the performance of a highly prestigious fellowship (e.g., AOA American British Canadian travelling fellowship, AOA North American travelling fellowship) were not associated with a shorter time to achieving the chair position.

Academic activities, including publications and grants

Many (30.1%) respondents reported having more than 100 publications, and 28.8% reported having 51–100 publications. More than half (55.8%) of the surgeons contributed to more than 10 book chapters. Forty-six respondents reported received more than US$1 million in research grants over the course of their careers, and 57 reported receiving between US$100 000 and US$1 million in research grants.

Motivation for leadership position

Respondents' decisions to take leadership positions were strongly motivated by a desire for new challenges, whereas the "opportunity to relocate at a new institution, financial gain, or necessity (lack of alternative candidates)" played little role in decision-making for most surgeons. Almost all (94.5%) department chairs reported a willingness to serve another term in their positions.

Job satisfaction

Most (94.9%) orthopedic surgeons were happy with their chosen subspecialty. Moreover, if given the chance to go back and choose another career path, 92.4% of surgeons would not change career paths. When asked how they would respond if their son or daughter expressed an interest in medicine, very few (4.5%) responded that they would discourage them from becoming a physician. When asked to pick a reason not to become a physician the most common answers were "the hours are too long" (41.7%) and "the stress is too high" (40.7%).

We found several factors associated with happiness with orthopedics as a career choice. Sports medicine as a career choice ($p = 0.039$) and motivation to take a position of leadership for personal development ($p = 0.026$) predicted happiness with orthopedics as a career. Age, sex and number of hours worked were not predictive of happiness with career choice. The regression model accounted for 43% of the variability in the dependent variable ($r^2 = 0.428$).

Work–life balance among leaders

On average, respondents worked 70.3 (range 50–110) hours per week, with an average of 40.9 hours dedicated to clinical duties, 12.6 hours to administrative duties, 10.5 hours to education and 8.3 hours to research (Table 1). No surgeon wished they worked more hours in the week. Three of every 4 (75%) surgeons reported that they did not have as much time for their personal lives as they should have. Many (59.9%) respondents reported spending less than 10 waking hours with their loved ones during a typical work week (Monday–Friday). About 20.0% of respondents reported that they seldom eat dinner with their spouses and children in a typical week (Monday–Sunday), whereas 19.2% reported doing so almost every night.

Physical and emotional health

More than half (58.3%) of surgeons reported exercising at least 3 times a week, 26.9% of those same surgeons reported that exercising 5 or more times per week (Table 2). Most (53.5%) respondents reported that their body mass index (BMI) was a little higher than it should be. Most had a primary care physician (74.0%), received routine check-ups (57.4%) and ate right most of the time (70.6%). Half of the respondents reported feeling physically "not bad; better than most people their age," whereas 23.1% reported feeling "terrific, with lots of energy and rarely rundown."

Most respondents reported either feeling terrific most of the time (14.6%) or happier and better-adjusted than most people (63.7%). When asked to rate how happy they are on a scale of 1–10, with 1 representing "very depressed" and 10 representing "extremely happy," the most common responses were 8 (42.7%) or 9 (25.5%). When asked to cite the happiest time in their life, the most common responses were "right now" (32.9%) and "I've always been pretty happy" (32.9%).

We found that being happy with specialty choice was significantly associated with being happy in life ($p = 0.034$). On the other hand, the number of hours worked, physical well-being and personal time were not predictive of overall happiness. The regression model accounted for 60% of the variability in the dependent variable ($r^2 = 0.598$).

Factors associated with the present being happiest the time in life

Fifty-one orthopedic surgeon leaders (32.9%) believed they were in the happiest time of their lives. We found that surgeons who were generally happy ($p = 0.008$), those who ranked high in their medical school classes ($p = 0.049$), those who were motivated to take a position of leadership in orthopedics out of a desire for personal development ($p = 0.045$) and those who had relocated to take on a new leadership position ($p = 0.017$) were most likely to be in the happiest time of their lives. Age, sex, marital status, academic productivity and years in a leadership position

Table 1. Survey responses related to work–life balance among highly successful orthopedic surgeons

Characteristic	No. (%)*
Mean (range) no. of hours worked per wk	70.3 (50–110)
Mean no. of hours/wk typically spent in each of the following areas	
Clinical, *n* = 157	40.9
Administrative, *n* = 156	12.6
Educational, *n* = 153	10.5
Research, *n* = 151	8.3
"I wish I worked..." *n* = 157	
More hours per wk	0 (0)
Fewer hours per wk	84 (53.5)
I'm happy with my current schedule most of the time	73 (46.5)
"I don't have as much time for my personal life as I should have," *n* = 156	
Yes	117 (75.0)
No	39 (25.0)
"In a typical work week (Monday–Friday), I spend..." *n* = 157	
Fewer than 6 waking hours with my family/loved ones per wk	33 (21.0)
7 –10 waking hours with my family/loved ones per wk	61 (38.9)
More than 10 waking hours with my family/loved ones per wk	63 (40.1)
"In a typical work week (Monday–Sunday), I eat dinner with my spouse and most or all of my minor children," *n* = 156	
Almost every night	30 (19.2)
At least 5 nights	32 (20.5)
3– 4 nights	60 (38.5)
1– 2 nights	23 (14.7)
Hardly ever	11 (7.1)

*Unless otherwise indicated.

were not predictive of surgeons feeling they were in the happiest time of their lives. The regression model accounted for 25% of the variability in the dependent variable ($r^2 = 0.246$).

Table 2. Survey responses related to physical health among highly successful orthopedic surgeons

Characteristic	No. (%)
"I exercise..." *n* = 156	
At least 5 times a wk	42 (26.9)
At least 3 times a wk	49 (31.4)
At least once a wk	42 (26.9)
I don't get much exercise	23 (14.7)
"I have a primary care physician," *n* = 154	
Yes	114 (74.0)
No	40 (26.0)
"I get regular check-ups and follow my doctor's advice," *n* = 155	
Yes	89 (57.4)
No	66 (42.6)
"I eat right most of the time," *n* = 153	
Yes	108 (70.6)
No	45 (29.4)
"I smoke cigarettes," *n* = 154	
Yes	2 (1.3)
No	152 (98.7)
"Physically, here's how I feel most of the time," *n* = 156	
Terrific; I have lots of energy and rarely feel run-down	36 (23.1)
Not bad; I'd say I feel better than most people my age	78 (50.0)
Fair; I'm a bit tired and stressed, but that's to be expected	36 (23.1)
Poor; I'm exhausted must of the time, and I have other symptoms that concern me	4 (2.6)
Very poor; let's just say I wish you hadn't asked	0 (0)
I have a diagnosed chronic illness, but I'm getting treated and feel about the way I should under the circumstances	2 (1.3)
I have a diagnosed chronic illness, and the treatment is not going well, or I'm not getting any better	0 (0)
"My BMI/body fat percentage is..." *n* = 157	
Just right	51 (32.5)
A little higher than it should be	84 (53.5)
Much higher than it should be	15 (9.6)
A little lower than it should be	1 (0.6)
Much lower than it should be	0 (0)
I don't know what my BMI/body-fat percentage is	6 (3.8)

BMI = body mass index.

Successful orthopedists compared with other physicians

We noted a number of differences between the orthopedic surgeons we surveyed and other physicians (Table 3). Whereas 94.9% of orthopedists were very happy with their choice of specialty, 49.7% of other physicians had the same level of job satisfaction ($p < 0.001$). Given the opportunity to go back in time and pick another career or subspecialty, other physicians were more likely than successful orthopedists to do so (42% v. 7.6%, respectively; $p < 0.001$). Orthopedic surgeons were more likely than other physicians to report exercising more than once per week (85% v. 69%, respectively; $p < 0.001$). Orthopedic surgeons were less likely than other physicians to report feeling tired and stressed (23% v. 31%, respectively; $p = 0.05$). When asked to rate their happiness on a scale of 1 to 10, with 10 representing "extremely happy," orthopedic surgeons were significantly more likely than other physicians to respond 7 or greater (89% v. 78%, respectively; $p = 0.003$).

Discussion

In our survey of 152 orthopedic surgeons (comprising department chairs, journal editors, *Journal of Bone and Joint Surgery* British edition editorial board members, and past and current presidents of orthopedic associations), we identified the following characteristics of highly successful surgeons.

- First, many contributed prolific numbers of publications and book chapters and obtained considerable funding for research activities.
- Second, many were motivated by a "desire for a personal development (interesting challenge, new opportunities)," whereas "relocating to a new institution, financial gain, or lack of alternative candidates" played little to no role in their decisions to take positions of leadership.
- Third, most were happy with their specialty choice and would not change anything in their career paths despite long work hours and high levels of stress.
- Fourth, despite time challenges, successful orthopedic surgeons made a strong effort to maintain their health;

Table 3. Highly successful orthopedic surgeons compared with other physicians

Category	Group; %		*p* value
	Highly successful orthopedic surgeons	Physicians in general	
Percent reporting that they are very happy with their choice of specialty	95	50	< 0.001
Percent reporting that they would choose another career or specialty if given the opportunity	8	42	< 0.001
Percent reporting that they exercise more than once per wk	85	69	< 0.001
Percent reporting that they feel physically tired and stressed	23	31	0.05
Percent selecting "7" or greater, when asked to rate how happy they are on a scale of 1–10, with "10" representing "extremely happy"	89	78	0.003

almost none of the respondents smoke and most have a healthy diet. Compared with other physicians, orthopedic surgeons exercise more, are more likely to have a primary care physician and feel better physically.

It is notable and unfortunate that among the 388 surgeons invited to take the survey (based on our selection criteria), only 5 were women. The shortage of women in orthopedics has been well documented; the 2008 AAOS Census Report found that only 4.4% of orthopedists in the United States are women.[15] However, there are suggestions that more women are entering orthopedics; 7.7% of orthopedists under the age of 40 are women, and 11.0% of AAOS candidate members (residency graduates within 5 years of completing their postgraduate training) are women.[15] Similarly, a recent survey found that 13% of orthopedic residents in postgraduate year 3 or higher in the United States are women.[16] Hopefully, the increasing prevalence of female orthopedists will lead to a greater female representation among the field's leaders. The long hours and lack of family time in orthopedic leadership positions may play a role in the small number of women who serve in these positions. Further investigation may help clarify the factors that have led to this situation.

Our survey achieved a response rate consistent with other surveys of surgeons.[9,17] The survey design and implementation ensured appropriate pretesting and piloting with a web-based administration. Our respondents represented a wide mix of orthopedic subspecialties, geographic locations and experiences, thereby improving the generalizability of the results. Our comparison group from the *Physicians Practice* study[13] provided useful and interesting insight about the relative characteristics of our sample compared with those of physicians in general. Finally, our definition of success and the choice of success surrogates as department chairs, journal editors and past/current presidents of major orthopedic associations may not reflect the breadth of positions indicating "highly successful surgeons." Our findings are not generalizable beyond this group of surgeons.

Limitations

There are several shortcomings to note in our study. Our survey response rate (39.2%) cannot exclude a nonresponder bias. It remains plausible that nonresponders were sufficiently pressed for time that our questions about hours worked and time constraints may represent a more conservative estimate of the reality of hours worked by this sample of surgeons. Our questionnaire was not fully validated and was designed to achieve a balance between efficiency in completion for respondents and a wide breadth of topics that were pertinent to our study's goals.

In general, there is a lack of literature providing insight into the characteristics of highly successful surgeons. There are, however, a number of studies that have explored the prevalence and severity of burnout among surgeons. In a survey of nearly 25 000 surgeons across multiple specialties, Shanafelt and colleagues[9] found that 40% of surgeons were burned out and 30% had symptoms of depression. Only 71% of the surgeons they surveyed reported that they would choose the same career path if given the opportunity. Among the factors associated with career satisfaction were high academic rank and specialization (orthopedic surgeons were among a number of surgical subspecialists who reported greater career satisfaction).[9]

Saleh and colleagues,[8] investigated burnout in a survey of 195 academic orthopedic leaders. Most respondents (70%) reported that the stressors of their jobs (e.g., excessive workload) had a moderate to severe impact on their lives. Many (72%) reported that the long hours hurt their family lives or other relationships. Three of 4 active leaders experienced moderate to high emotional exhaustion. All of the respondents reported being a "workaholic," and 1 in 3 department chairs believed that they would likely step down from their positions within the next 2 years.[10] While the respondents to our survey mirrored the long hours, most reported being happy with an acceptable work–life balance. In fact, 1 in 3 surgeons who responded to our survey described themselves as being in the happiest time of their lives, and 9 of 10 respondents were willing to repeat a term as a department chair.

In a survey of 386 orthopedic residents and 264 orthopedic faculty members by Sargent and colleagues[17] respondents reported higher rates of burnout (32% of residents and 28.4% of faculty) and depersonalization (56% of residents and 24.8% of faculty), but less emotional exhaustion than the orthopedic leaders surveyed by Saleh and colleagues.[8] Twenty-three percent of residents and 15% of faculty responding to the survey by Sargent and colleagues[17] reported that they would not choose medicine as a career again; this rate is much higher than that of 4.5% in our study. Sargent and colleagues[17] found that meaningful contact with mentors was associated with less emotional exhaustion and depersonalization, and increased levels of personal achievement.

Overall, these studies and our data emphasize that the challenge of a surgical career, especially one in a leadership role, should not be underestimated. The sacrifices associated with these positions (e.g., long hours and lack of family time) should be considered when job descriptions are created by administrators or boards of directors. In addition, aspiring orthopedic leaders should note the strong work ethic and attention to personal health that has likely contributed to the success of the field's current leaders.

Our survey provides some fundamental insight into the characteristics of successful orthopedic surgeons. At the forefront, a key success indicator is the desire for leadership and an intrinsic motivation to achieve success. Most (72.5%) surgeons in our survey were strongly motivated for new challenges. This intrinsic motivation for challenges likely reflects the high productivity of these individuals in research (publications, editorships), education (textbooks, speaking

engagements), innovation (implant design, consulting) and administration (local and national organizations).

Conclusion

Our survey represents a unique initiative to identify the characteristics of highly successful orthopedic surgeons. Regardless of whether readers accept our definitions of success or our decision to use departmental chairs, journal editors and presidents of major orthopedic organizations as surrogates for success, our findings may be generalized to a fundamental truth: the criteria for success is largely a personal one. In a broad cohort of orthopedic surgeons, our work suggests that most orthopedic surgeons are typically busy, yet they make strong efforts to maintain their health by eating well, exercising regularly, seeing a primary care physician and abstaining from smoking. In addition, while they spend most of their time on clinical duties, this group of orthopedic surgeons contributes prolific numbers of publications and book chapters while participating in the editing of orthopedic journals and leadership of specialty organizations. Highly successful orthopedic surgeons appear to be intrinsically motivated and satisfied despite the challenges of long hours and high levels of stress.

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References

1. Griffin R. *Management*. 10th ed. Mason (OH): Cengage Learning; 2010.
2. Kreitner R. *Management*. Boston (MA): Houghton Mifflin Co; 2009.
3. Lane P. *Management*. Eagan (MN): CL-South-Western; 2010.
4. Martin R. How successful leaders think. *Harv Bus Rev* 2007;85:60-7, 139.
5. Murray AS. *The Wall Street journal essential guide to management: lasting lessons from the best leadership minds of our time*. New York: Harper Business; 2010.
6. Schermerhorn JR Jr. *Management*. 10th ed. Hoboken (NJ): John Wiley & Sons; 2009.
7. Zetrenne E, Wirth GA, Kosins AM, et al. Profiling the Association of Academic Chairmen of Plastic Surgery. *Plast Reconstr Surg* 2008;121:328e-32e.
8. Saleh KJ, Quick JC, Conaway M, et al. The prevalence and severity of burnout among academic orthopaedic departmental leaders. *J Bone Joint Surg Am* 2007;89:896-903.
9. Shanafelt TD, Balch CM, Bechamps GJ, et al. Burnout and career satisfaction among American surgeons. *Ann Surg* 2009;250:463-71.
10. Johns MM III, Ossoff RH. Burnout in academic chairs of otolaryngology: head and neck surgery. *Laryngoscope* 2005;115:2056-61.
11. Moore EE. Swimming with the sharks–without the family being eaten alive. *Surgery* 1990;108:125-38.
12. Merriam-Webster. *Success*. Available: www.merriam-webster.com/dictionary/success (accessed 2011 Apr. 17).
13. Michael S. The Great American Physician Survey. *Physicians Practice* 2009. Available: www.physicianspractice.com/great-american-physician-survey-0 (accessed 2012 Oct. 22).
14. Gmelch WH, Miskin VD. Understanding the challenges of department chairs. In: *Leadership skills for department chairs*. Boston (MA): Anker; 1993. p. 3-18.
15. American Academy of Orthopaedic Surgeons (AAOS). *Orthopaedic Practice and Medical Income in the U.S. 2008*. Rosemont (IL): AAOS Department of Research and Scientific Affairs; 2009.
16. Hariri S, York SC, O'Connor MI, et al. Career plans of current orthopaedic residents with a focus on sex-based and generational differences. *J Bone Joint Surg Am* 2011;93:e16.
17. Sargent MC, Sotile W, Sotile MO, et al. Quality of life during orthopaedic training and academic practice. Part 1: orthopaedic surgery residents and faculty. *J Bone Joint Surg Am* 2009;91:2395-405.

Correction

In the Bethune Round Table 2011 abstracts published in the December 2011 issue of *CJS*, the name of Alexandre Gosselin Tardif was spelled incorrectly. We apologize for this error.