Success in Academic Spine Surgery: The Role of Mentoring

Christina Goldstein[1]

[1] Division of Neurosurgery, Toronto Western Hospital Spine Program, University of Toronto, Toronto, Ontario, Canada

Evid Based Spine Care J 2013;4:90–95.

Address for correspondence Dr. Christina Goldstein, MD, FRCSC, Division of Neurosurgery, University of Toronto, Toronto Western Hospital, 399 Bathurst Street, 4th Floor West Wing 4-427, Toronto, Ontario, Canada M5T 2S8 (e-mail: drcgoldstein@gmail.com).

Introduction

Since the 1980s, multiple sources have suggested that the number of clinician scientists in academic medicine has declined substantially.[1–5] More recently, Corrice et al identified that 2.9 to 10% of American, full-time clinical MD faculty planned to leave academia and 13 to 27.8% were unsure of staying or leaving.[6] Although no data regarding the size or productivity of the academic spine surgeon workforce has ever been published, there is reason to believe that a similar phenomenon is occurring within our specialty. Furthermore, as the demand for spine surgery continues to grow[7–10] in the face of intensifying competition for health-care resources, the call for high-quality studies to guide spine surgeons, payers, and policy-makers is stronger than ever. With the resulting scenario, in which fewer academic spine surgeons are being asked to produce more evidence upon which decision making in spine surgery can be based, the need for recruitment and retention of academic spine surgeons has never been greater.

A career in academic medicine provides young spine surgeons with the opportunity to practice in an environment where they can educate the next generation of surgeons, contribute meaningfully to the spine literature and provide outstanding clinical care. Unfortunately, multiple barriers to the pursuit of an academic surgical career exist.[11] In particular, a lack of motivated and experienced mentors has been consistently identified as a barrier to successful completion of research and a reason for not choosing a career in academic medicine.[5,12–14] Because early and sustained mentorship significantly predicts future dedication of time to research efforts,[15] it is imperative that practicing spine surgeons understand the role of mentoring in the development of future spine clinician scientists.

The purpose of this article is to review the definition of a mentor as well as to outline the specific functions of a mentor in the context of establishment of career in academic medicine. The essential characteristics of outstanding mentors will then be discussed, as will the qualities and actions of successful mentees. Finally, the proposed benefits of participating in a mentoring relationship for both the senior and junior academic spine surgeon will be outlined.

What is a Mentor?

In Greek mythology, Mentor was the trusted servant in whose care Odysseus left his son Telemachus when he set off for Troy to battle the Trojans, and in whose guise the goddess Athena tutored and raised Telemachus to be a brave, honest, and respectable young man.[16] Today, the term "mentor" applies to one involved in a dynamic, reciprocal relationship that is aimed at promoting the development of both the experienced individual and the beginner.[17] In the context of research, mentoring is a complex process through which emerging scientists acquire the norms and standards, values and attitudes, knowledge, skills, and behaviors necessary to become successful, independent researchers.

Functions of a Mentor

In order for the successful transition from junior spine researcher to independent, academic, spine surgeon to occur, mentors must perform a variety of functions. Unlike the passive position of a role model—an individual who demonstrates a standard of excellence to be imitated and transfers knowledge regarding expected behaviors to the trainee through observation alone—[18]mentoring requires constant, active participation on the part of the senior spine surgeon. Although it is customary for mentors to act as role models for their mentees, mentors also perform the functions of teacher, counselor, guide, and sponsor, with these tasks having the purpose of providing either career support or psychosocial support[19] (►**Table 1**).

received
June 13, 2013
accepted
July 19, 2013

DOI http://dx.doi.org/10.1055/s-0033-1357367.
ISSN 1663-7976.

Table 1 Functions of a mentor

Dimension	Function
Career support	Exposure Visibility Sponsorship Protection
Psychosocial support	Friendship Counseling Acceptance Confirmation Role modeling

Career Support

Early in the mentee's career as a fledgling academic spine surgeon, a primary function required of the mentor is to expose the mentee to key players in the academic spine world and increase the mentee's visibility to this important group of individuals. This may be done through recommendation of tasks such as meeting attendance, research involvement, or committee membership that is designed to introduce the mentee to important members of the local and distant spine community. Mentors can also provide sources of grant funding, and they can introduce mentees to individuals capable of providing skills such as data management and statistical analysis, which are required by the mentee for successful research completion. The mentor also acts as a sponsor, providing behind-the-scenes endorsements of the mentee to identify them as an individual with a desirable knowledge and skill-set that may be of value to others.

Of equal importance, the mentor functions to provide a certain level of protection for the mentee, especially during the early phases of his or her career when unfamiliarity with the workplace landscape may lead to career missteps. The mentor assumes the role of "tour guide," instructing the mentee on the "lay of the land" at their institution as well as the safest way to navigate it. The mentor helps identify potential pitfalls and instructs the mentee on how to avoid nonproductive collaborations, time-consuming commitments to tasks that will not directly enhance his/her career, and harmful encounters with or exploitation by unsupportive or adversarial colleagues. If the mentee does become involved in a negative interaction with colleagues, the mentor may directly intervene on the mentee's behalf, working to quickly and safely extract him or her from the situation.

Psychosocial Support

In addition to assisting with career development, excellent mentors also function to provide psychosocial support to their mentees. Because of the intimate nature of mentoring relationships, over time they may evolve into friendships, with a strong, personal connection between mentor and mentee characterizing most successful mentorship pairings.[20]

In periods of hardship or challenge, mentors may also be called upon to function as counselors, helping their mentees identify issues that may be acting as stressors and assisting in the identification of ways in which the distressing or negative situations can be resolved. Understanding mentors can reassure their mentees by offering acceptance of shortcomings and failures and acknowledgment of a job well done, regardless of the outcome. The open sharing of personal anecdotes, relating early successes and failures by a mentor can help reaffirm the mentee's belief that resilience and persistence will lead to ultimate success despite temporary setbacks.

Finally, outstanding mentors function as positive role models of work–life balance, professionalism and ethical behavior. By consistently working to maintain balance between their personal and professional lives, mentors demonstrate ways in which the mentee can achieve success and happiness both at work and at home.[21]

Characteristics of Successful Mentors

Completion of the functions of a mentor is mandatory for a successful mentoring relationship. However, the manner in which the mentor carries out these roles is crucial and can make or break even the strongest mentoring relationships.[20] As a result, the most common theme examined in articles related to mentoring in surgery is the characteristics of a successful mentor[14] and multiple systematic reviews have addressed this topic.[12,18,22] Though the terminology used to describe the characteristics of successful mentors varies significantly throughout the literature, the qualities of outstanding mentors can be broadly categorized as personal attributes, behaviors toward mentees, and professional attributes[22] (►**Table 2**).

Personal Attributes

Personal attributes are those characteristics of a mentor that allow for the creation of a safe environment in which interactions with the mentee can occur. This gives the mentee freedom to identify and explore their attitudes, goals, hopes, and fears without fear of embarrassment or criticism. Above

Table 2 Characteristics of a successful mentor

Category	Characteristic
Personal attributes	Altruistic Active listener Nonjudgmental Reliable and responsive Trustworthy Patient Honest Self-appraising
Behaviors	Accessible Works hard at relationship Consistent source of assistance Identifies mentee's strengths and weaknesses Helps mentee set goals and reach them
Professional attributes	Successful Well-respected Well-connected

all, mentors are altruistic individuals who put the needs of their mentees ahead of their own, operating without ulterior motives or hidden agendas. Outstanding mentors are also active listeners, devoting their complete attention to their mentees during interactions. They work hard to understand the perspective of their mentees by encouraging open discussion and requesting clarification as needed. By doing so, successful mentors work with their mentees to help them identify their own strengths and weaknesses and develop plans for overcoming obstacles and attaining goals. In this way, mentors avoid spoon-feeding their mentees a roadmap to personal and academic success.

Mentors must also be nonjudgmental, accepting the mentees' priorities, opinions, and personality traits, to avoid creating an exact clone of themselves, but rather a unique and independent academic spine surgeon. Furthermore, successful mentors must be patient with their mentees' shortcomings. When setbacks or failures occur, they should work with their mentees to help them identify behaviors that may be acting as barriers to success rather than blaming the mentee personally. Successful mentors are also reliable, responsive, and trustworthy. They fulfill their promises to their mentees and can be counted on to respond promptly to requests for assistance or advice, always keeping details of interactions and conversations confidential.

Most importantly, outstanding mentors are honest and self-appraising. They routinely solicit feedback from their mentees and evaluate their own performance as mentors to identify ways of improving the relationship to ensure continued mentee success. They may also actively seek out resources such as books, faculty development programs, or their own personal mentors for developing their mentoring skills. By doing so, outstanding mentors demonstrate their understanding that a one-size-fits-all approach to mentoring will likely not be successful and arm themselves with the tools necessary to effectively mentor many different junior colleagues throughout their careers.

Behaviors toward Mentees

The behavior of mentors toward mentees is also crucial to ensuring the success of the mentoring relationship, and it must be performed in a manner compatible with the mentee's practice style, vision, and personality. Given that lack of commitment is a key characteristic of failed mentoring relationships in academic medicine,[20] it is imperative that successful mentors remain accessible to their mentees. Although face-to-face contact is not always possible, effective use of alternate methods of communication, including e-mail and phone contact will ensure that the mentee feels constantly supported, never neglected and left to flounder independently in challenging or stressful situations.

Successful mentors also keep their mentoring duties high on their list of priorities. They continuously work hard to cultivate the relationship and send the message to their mentee that his or her success is important and worth the effort. Mentors help their mentees define their short- and long-term personal and career goals, ensuring that they are not so lofty as to guarantee failure but are challenging enough to stimulate continued mentee growth and development. The mentor assists the mentee in reaching these goals by identifying the mentee's skills and strengths as well as areas for self-improvement. When these goals are reached, the mentor holds the mentee's achievements in high regard.

Professional Attributes

Finally, with regards to professional attributes, successful mentors are far enough along their own career path to have acquired the professional attributes necessary to allow them to meet the demands of the mentor–mentee relationship. Having been involved in their field for several years, successful research mentors will have achieved a sufficient level of academic success to allow them to comfortably promote their mentee's career without concerns for competition related to matters of authorship, research funding, or recognition. Seasoned mentors will also have developed a wide network of academic associates to whom their mentee can be exposed and with whom future collaborative opportunities may be explored. Furthermore, as a well-respected member of the academic community, the mentor's promotion of his or her mentee is more likely to be received by others as an honest and trustworthy assessment of the junior colleague's skills and qualifications, with the desired outcome of the creation of positive opportunities for mentee career advancement.

Characteristics of Successful Mentees

While much of the focus related to successful mentoring has been on qualities of outstanding mentors, the successful mentor–mentee relationship is far from a one-sided affair. Comparatively, little data exist regarding the characteristics of successful mentees, and consensus regarding what responsibilities lie with the mentee is nonexistent.[14] However, active mentee participation is critical to all phases of mentoring, particularly during the initiation of the relationship.[23] The ability of the mentee to view the mentoring relationship as a reciprocal one will help avoid mentor burnout and loss of interest in the mentee as well as potential failure of the mentoring relationship.[20]

During the early phases of mentorship, young spine surgeons must drive the process by identifying and approaching potential mentors with whom they share clinical and research interests and who may be willing and available to take them on. Demonstration of instrumentality, the possession of traits such as decisiveness, independence, and persistence, has been shown to correlate positively with having a mentor.[24] In addition, mentor self-selection may help avoid personality differences or absence of shared values that can contribute to the failure of the mentoring relationship.[20] While formal mentorship programs with assigned mentor–mentee pairings can be successful,[13] mentee identification of a mentor has been associated with more comfortable and effective relationship development.[22]

Once the mentoring relationship has been established, mentees should schedule regular face-to-face meetings with their mentors. The ideal frequency of mentor–mentee interactions is unclear and may be flexible, depending on the

of-the-moment needs of the mentee. However, mentees must always come prepared to meetings rather than expecting to be handed a to-do list by their mentor.[20] Preparation should include, but is not limited to, creating a list of prioritized topics of discussion and developing potential timelines for project completion. The mentee should also be prepared to discuss future dates for meetings such that forward momentum of the relationship is maintained.

The best mentees are also reliable and responsible, efficiently completing projects before agreed upon deadlines. They are respectful of their mentor's time and other commitments, providing mentors with adequate turn-around time for completion of involved tasks such as proofreading manuscripts and writing letters of reference. Finally, as it is not imperative that mentees always follow their mentor's advice or pursue every opportunity that is presented to them, they should acknowledge the effort required of the mentor to create opportunities for the mentee and must be open to mentor feedback. Bolstered by the knowledge that one's mentor is acting in their best interest and is dedicated to their personal and career development, the mentee will be able to view constructive criticism as just that and hurt feelings and bruised egos will be avoided.

Benefits of Mentoring Relationships

Although some surgeons are born with the skills required to be successful mentors, mentoring in academic spine surgery is not for everyone. Mentoring is a complex relationship requiring significant time commitments and emotional investment on the part of both the mentor and mentee. Furthermore, failure of the mentoring relationship may occur because of a variety of factors, with cynicism and disillusionment being felt by both parties if this occurs.[20] However, no study has ever identified mentoring to be unnecessary or to impact negatively on surgical trainees.[14] Failed mentoring relationships have even occasionally been described as "good life lessons."[20] Thus, in the majority of cases, the expected benefits for mentors and mentees far outweigh the risks (►**Table 3**).

Benefits for the Mentee

The benefits of mentoring for the mentee can be grouped into personal as well as professional benefits. With regards to personal benefits, early and sustained mentorship results in mentee reports of greater self-efficacy and increased confidence in one's clinical and academic skills.[25–31] As a result, fellows and young clinician scientists with mentors score higher on subjective measures of career success[24] and enjoy elevated levels of career satisfaction compared with their counterparts without mentors.[26,32]

Improved objective measures of career success also reveal the professional benefits of mentoring. Early on in their careers, mentored physicians are more productive in their academic pursuits,[30,33–35] publish more often,[12,13,15,30,32,36] and obtain more grant support[15,26,29,36] than physicians without mentors. As a result of this initial productivity, mentored academic clinicians and surgeons are more likely to be promoted[37–40] and are more likely to remain in an academic career.[28,29,39]

Benefits for the Mentor

Though the benefits of mentoring are easier to quantify for the mentee, outstanding academic mentors also have a great deal to gain from the mentor–mentee relationship. From a professional perspective, members of the academic spine community will identify successful mentors as having an aptitude for spotting and developing young talent. In addition, because a mentor will often also function as a research supervisor, he or she will frequently receive partial recognition for successful publications and grants awarded. Finally, outstanding academic mentors will have developed a cohort of trustworthy and reliable lifelong colleagues with whom they can collaborate for years to come.

More importantly, the personal benefits of mentorship for the mentor are immense. By acting as positive role model for other faculty members, mentors have a unique opportunity to create a culture of mentoring within their division and are rewarded with the satisfaction of having left a "legacy of mentoring" that will affect future generations of academic spine surgeons.[21] Outstanding mentors will also have had the

Table 3 Benefits of a successful mentoring relationship

Individual	Domain	Benefit
Mentee	Personal	Increased self-efficacy Increased career satisfaction Greater subjective career success
	Professional	Increased research productivity Increased grant funding Higher likelihood of promotion Higher likelihood of academic retention
Mentor	Personal	Subjective feeling of repayment of debt owed to one's own mentors Feelings of pride and excitement
	Professional	Identification as a cultivator of young talent Development of trusted, reliable collaborator Creation of a "legacy of mentoring"

chance to repay the debt they may feel they owe their own mentors for the guidance, support, and assistance they received during the early phases of their own careers. Finally, successful mentors can experience unparalleled feelings of pride and joy knowing they had a hand in helping their mentee reach their personal and professional goals and achieve successes neither individual may have initially thought possible.

Conclusions

Since the earliest example of the essential role mentors play in the development of young surgeons, when Harvey Cushing, mentored by William Halstead, founded the specialty of neurosurgery,[41] the positive effect of mentoring in academic medicine continues to be demonstrated. Today, there is substantial evidence to support the vital role of mentoring in academic medicine. Thus, questions regarding mentoring no longer relate to whether or not mentoring is necessary, but rather, how best to successfully integrate mentoring into the complex world of academic medicine.

As the landscape of modern spine surgery changes, with increased focus on work–life balance combined with increasing clinical, administrative, and managerial demands of academic spine surgeons, the need for outstanding mentors in the field of spine surgery continues to rise. Although this article provides insight into the ways in which individual mentors and mentees may ensure the success of their own mentoring relationships, further research into the impact of mentoring on academic spine surgery at an institutional, national, and international level is required to ensure the ongoing survival and success of our specialty.

Disclosures

No funding was received for preparation of this manuscript. The author has no disclosures.

References

1 Brunette MG, Monast MA. The vanishing clinician—scientist. Can Med Assoc J 1982;127(8):675–676
2 Hurwitz SR, Buckwalter JA. The orthopaedic surgeon scientist: an endangered species? J Orthop Res 1999;17(2):155–156
3 Rosenberg L. Physician-scientists—endangered and essential. Science 1999;283(5400):331–332
4 Badaró R, Jones TC. Preventive health care for an endangered species—the physician scientist. Braz J Infect Dis 2001;5(2): 101–103
5 Brand RA, Hannafin JA. The environment of the successful clinician-scientist. Clin Orthop Relat Res 2006;449:67–71
6 Corrice AM, Fox S, Bunton SA. Retention of full-time clinical MD faculty at US medical schools. Analysis in Brief 2011;11(2):1–2
7 Deyo RA, Mirza SK. Trends and variations in the use of spine surgery. Clin Orthop Relat Res 2006;443:139–146
8 Gray DT, Deyo RA, Kreuter W, et al. Population-based trends in volumes and rates of ambulatory lumbar spine surgery. Spine (Phila Pa 1976) 2006;31(17):1957–1963, discussion 1964
9 Wang MC, Kreuter W, Wolfla CE, Maiman DJ, Deyo RA. Trends and variations in cervical spine surgery in the United States: Medicare beneficiaries, 1992 to 2005. Spine (Phila Pa 1976) 2009;34(9): 955–961, discussion 962–963
10 Oglesby M, Fineberg SJ, Patel AA, Pelton MA, Singh K. Epidemiological trends in cervical spine surgery for degenerative diseases between 2002 and 2009. Spine (Phila Pa 1976) 2013;38(14): 1226–1232
11 Kubiak NT, Guidot DM, Trimm RF, Kamen DL, Roman J. Recruitment and retention in academic medicine—what junior faculty and trainees want department chairs to know. Am J Med Sci 2012; 344(1):24–27
12 Sambunjak D, Straus SE, Marusić A. Mentoring in academic medicine: a systematic review. JAMA 2006;296(9):1103–1115
13 Cohen JG, Sherman AE, Kiet TK, et al. Characteristics of success in mentoring and research productivity - a case-control study of academic centers. Gynecol Oncol 2012;125(1):8–13
14 Entezami P, Franzblau LE, Chung KC. Mentorship in surgical training: a systematic review. Hand (NY) 2012;7(1):30–36
15 Steiner JF, Curtis P, Lanphear BP, Vu KO, Main DS. Assessing the role of influential mentors in the research development of primary care fellows. Acad Med 2004;79(9):865–872
16 Gough I. Mentoring: historical origins and contemporary value. ANZ J Surg 2008;78(10):831
17 Healy CC, Welchert AJ. Mentoring relations: a definition to advance research and practice. Educ Res 1990;19(9):17–21
18 Jochemsen-van der Leeuw HG, van Dijk N, van Etten-Jamaludin FS, Wieringa-de Waard M. The attributes of the clinical trainer as a role model: a systematic review. Acad Med 2013;88(1):26–34
19 Kram KE. Mentoring at Work: Developmental Relationships in Organizational Life. Glenview, IL: Pearson Scott Foresman; 1985: 1–268
20 Straus SE, Johnson MO, Marquez C, Feldman MD. Characteristics of successful and failed mentoring relationships: a qualitative study across two academic health centers. Acad Med 2013;88(1):82–89
21 Cho CS, Ramanan RA, Feldman MD. Defining the ideal qualities of mentorship: a qualitative analysis of the characteristics of outstanding mentors. Am J Med 2011;124(5):453–458
22 Sambunjak D, Straus SE, Marusic A. A systematic review of qualitative research on the meaning and characteristics of mentoring in academic medicine. J Gen Intern Med 2010;25(1):72–78
23 Zerzan JT, Hess R, Schur E, Phillips RS, Rigotti N. Making the most of mentors: a guide for mentees. Acad Med 2009;84(1):140–144
24 Stamm M, Buddeberg-Fischer B. The impact of mentoring during postgraduate training on doctors' career success. Med Educ 2011; 45(5):488–496
25 Morzinski JA, Diehr S, Bower DJ, Simpson DE. A descriptive, cross-sectional study of formal mentoring for faculty. Fam Med 1996; 28(6):434–438
26 Palepu A, Friedman RH, Barnett RC, et al. Junior faculty members' mentoring relationships and their professional development in U. S. medical schools. Acad Med 1998;73(3):318–323
27 Tracy EE, Jagsi R, Starr R, Tarbell NJ. Outcomes of a pilot faculty mentoring program. Am J Obstet Gynecol 2004;191(6):1846–1850
28 Wingard DL, Garman KA, Reznik V. Facilitating faculty success: outcomes and cost benefit of the UCSD National Center of Leadership in Academic Medicine. Acad Med 2004;79(10, Suppl):S9–S11
29 Zeind CS, Zdanowicz M, MacDonald K, Parkhurst C, King C, Wizwer P. Developing a sustainable faculty mentoring program. Am J Pharm Educ 2005;69(5):1–13
30 Thorndyke LE, Gusic ME, George JH, Quillen DA, Milner RJ. Empowering junior faculty: Penn State's faculty development and mentoring program. Acad Med 2006;81(7):668–673
31 Feldman MD, Arean PA, Marshall SJ, Lovett M, O'Sullivan PO. Does mentoring matter: results from a survey of faculty mentees at a large health sciences university. Med Educ Online 2010; doi: 10.3402/meo.v15i0.5063
32 Ramanan RA, Taylor WC, Davis RB, Phillips RS. Mentoring matters. Mentoring and career preparation in internal medicine residency training. J Gen Intern Med 2006;21(4):340–345

33 Chew LD, Watanabe JM, Buchwald D, Lessler DS. Junior faculty's perspectives on mentoring. Acad Med 2003;78(6):652
34 Rabatin JS, Lipkin M Jr, Rubin AS, Schachter A, Nathan M, Kalet A. A year of mentoring in academic medicine: case report and qualitative analysis of fifteen hours of meetings between a junior and senior faculty member. J Gen Intern Med 2004;19(5, Pt 2): 569–573
35 Barker ER. Mentoring—a complex relationship. J Am Acad Nurse Pract 2006;18(2):56–61
36 Steiner JF, Lanphear BP, Curtis P, Vu KO. Indicators of early research productivity among primary care fellows. J Gen Intern Med 2002; 17(11):845–851
37 Wise MR, Shapiro H, Bodley J, et al. Factors affecting academic promotion in obstetrics and gynaecology in Canada. J Obstet Gynaecol Can 2004;26(2):127–136
38 Beasley BW, Simon SD, Wright SM; The Prospective Study of Promotion in Academia (Prospective Study of Promotion in Academia). A time to be promoted. J Gen Intern Med 2006;21(2): 123–129
39 Kosoko-Lasaki O, Sonnino RE, Voytko ML. Mentoring for women and underrepresented minority faculty and students: experience at two institutions of higher education. J Natl Med Assoc 2006; 98(9):1449–1459
40 Emans SJ, Goldberg CT, Milstein ME, Dobriner J. Creating a faculty development office in an academic pediatric hospital: challenges and successes. Pediatrics 2008;121(2):390–401
41 Assael LA. Every surgeon needs mentors: a Halsteadian/Socratic model in the modern age. J Oral Maxillofac Surg 2010;68(6): 1217–1218

Editorial Perspective

The *EBSJ* Editors accepted this submission as a standout article despite being completely absent of hard numbers and statistical tests. The value of this paper lies in the emphasis placed on developing clinician scientist spine surgeons of the future and it calls for and defines the tremendous role a mentor can play in the development of such individuals. By providing such a well thought-out foundational analysis and creating an inspiring read for present and future spine investigators, the *EBSJ* Editors felt that Dr. Goldstein richly deserves peer-reviewed publication.