



Anesthesiology mentoring

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Purpose of review

Mentoring is fundamentally valuable and important to students considering a path into our specialty, as well as to colleagues already in it and with ambition to advance. General principles and personal experiences are collected and described to help inform future mentors and to reinforce the value of having a mentor and the satisfaction (and work) that is associated with such a role.

Recent findings

Detecting a latent talent among medical students or residents may be challenging but is worth the effort to develop personal careers and the specialty itself. Upon agreeing to jointly move a certain project, a professional plan is needed to improve chances of success and decrease the likelihood of frustration. Various challenges always have to be detected and solved, with the ultimate goal to guide a medical student to residency, subsequently into faculty status and preferably to lifelong collaboration.

Summary

Access to a mentor is an often-cited key to choosing a specialty and the success of junior colleagues and thus the entire department. Mentoring is fundamentally valuable in providing role modeling and also in protecting the mentee from the inefficiency of learning lessons the hard way.

Keywords

advance mentoring, anesthesiology, career, mentee, mentoring, science, solving problems, success, teaching, training

INTRODUCTION

The Department of Anesthesiology is often one of the largest departments in teaching hospitals [1], a fact usually not recognized by medical students. This lack of recognition is frequently aggravated by the fact that an anesthesiology rotation is not part of the typical medical school curriculum. Accordingly, the likelihood that medical students select anesthesiology as a career is lower than in other higher profile-appearing medical disciplines. This seems to be a global phenomenon ranging from Saudi Arabia [2], to Nigeria [3], India [4], Pakistan [5], and the USA [6–8]. Subsequent difficulties attracting and recruiting the best medical students to enter an anesthesiology residency are thus no great surprise [9], despite what those of us in the specialty consider to be many attractive aspects of anesthesiology as a career [10]. A further challenge is the sheer size of many anesthesiology departments, rendering random encounters with many different people the norm, a circumstance that does not build strong connections with individual medical students or confidence in junior residents.

It was the medical students who first described spermatozoa, ether, penicillin, heparin, the atrioventricular-knot, insulin, Langerhans islets,

and the gall bladder sphincter, invented the roller pump, and were visionaries of the National Library of Medicine [11]. These remarkable milestones are astonishing and remind us of what is possible from our students and junior colleagues. Current efforts to inspire research inquiry often succumb to some combination of lack of personal scientific interest, busy clinical schedules, burden of debt to be repaid, and lack of institutional interest to foster research. Young talent needs to be identified, supported, and challenged [12], all the while keeping in mind that generation Y (as do we, as well) wants to have fun and maintain a positive work–life balance [13]. Further, many budding researchers lose interest when their protected research time is canceled, when they must deal with institutional review board

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KEY POINTS

- Identifying a medical student, resident, or faculty colleague who will blossom academically or clinically is often difficult because signs of substantial interest may be very subtle.
- Advancing the scientist/academic side can best be described as a 'walk before you run' approach to allow the mentee to experience some early success.
- A professional plan between mentor and mentee needs to be set up to ensure success and solve challenging problems.
- Access to a mentor is an often-cited key to choosing a specialty and the success of junior colleagues and thus the entire department.
- Mentoring is fundamentally valuable in providing role modeling and also in protecting the mentee from the inefficiency of learning lessons the hard way.

(IRB) delays and rewrites, and they suffer the inevitable failed experiment, rejected manuscript, personal problem, and nonfunded grant application.

Mentors help to navigate these obstacles more efficiently and effectively. In our opinion, mentoring is key to sustainably nurturing both clinical and scientific success and guiding young talents from their first encounter, whether it is as an undergraduate or medical student, to residency and fellowship, and then on through the assistant to full professorship progression leading to clinical, administrative, educational, or academic positions. Similar to parents rearing their children, mentors coach junior clinicians and scientists to develop themselves in a professional world that is far too complex to navigate by oneself. In our experience, a mentored physician has a much higher likelihood to stay in academic medicine and/or become a superb clinician, be productive, and contribute to both the intramural and extramural scientific and clinical communities than one left to fend for himself. From our personal experiences and from others, mentorship does not have an expiration date. Even editors-in-chief of leading journals like *Anesthesiology* and *Anesthesia & Analgesia* rely on advice from more senior colleagues [14,15]. It is also important to remember that a mentor does not have to be chronologically or even academically senior to you in the traditional sense to serve in a mentorship capacity.

DETECTING LATENT TALENT

Identifying a medical student, resident, or faculty colleague who will blossom academically or clinically is often difficult because signs of substantial

interest may be very subtle. For example, it may be a student who walks up to the lecturer after an oral presentation and strikes up a discussion, a specific question in a seminar, an e-mail request for information, a special comment in a clinical rotation, or a recommendation by a colleague. Some medical students may be intrigued by mentors from their teenage years [16], listen to their stories carefully, as that usually indicates a very powerful motivation. These signs for potentially extraordinary individuals may be easily overlooked in a busy personal schedule, but they are worth keeping an eye out for – amazing developments may follow. Individuals who simply want to show off, schmooze themselves into better grades, or make themselves important among their peers will contaminate the early pool of potential mentees but are soon identified. In our experience, the aforementioned subtle signs combined with a certain ambition for seizing a special opportunity and the willingness to do the hard work are the basis for a productive scientific and/or clinical career. For the most reliably effective path, the mentee needs to be matched with a mentor who is not only willing and able, but also interested in coaching a mentee over years or even decades. A mentor should view his/her role as both a responsibility and a privilege. As a mentor, do not underestimate the time, energy, and patience needed to guide a mentee. Ideally, the mentor should have substantial experience in the shared field of interest, as myriad questions will be raised by a hardworking mentee. Research-related meetings need to determine if observations or questions are novel and important or simply time-consuming and energy-consuming laboratory phenomenon. It is not uncommon for the mentor to be nudged deeper into a question by his/her mentee – this is part of the challenge and the reward. Further, mentor and mentee should have a good understanding about each other's personal lives, as mutual interests will cool off rapidly if conflicts develop such as different approaches in working speed or sabbaticals for personal issues need to be taken. A mentor–mentee relationship has many parallels to dating and thus also may not last despite great early promise. This does not imply failure *per se*, but often simply a lack of a best fit. The repair may be to simply work with another person or even at another place where there is a better personal, laboratory, or clinical fit. We find that overlapping leisure interests are helpful as well, as discussion and thinking outside the box usually develop best when minds are relaxed.

One approach to becoming comfortable with a potential mentee occurs before starting a project: ask her/him to define the terms respect, responsibility, and sustainability in three sentences or less. If

you are of a similar mind on these, this is a good predictor of joint success and sustained interpersonal compatibility. Talking about these issues demonstrates to a young individual that justification for time, resources, and even laboratory animal's lives need to be taken very seriously, especially when project development is slower and/or more difficult than anticipated. For example, one of my (V.W.) most important projects when I was a medical student was measuring lower esophageal sphincter pressure in patients undergoing withdrawal of life support in the ICU. Because of the requirement for informed consent from the patient's relatives and difficult technical and context-sensitive time limitations, it was a very delicate project and took several years, but its outcome was very valuable in contributing to updates of cardiopulmonary resuscitation guidelines [17]. If a mentor has a productive working group and puts substantial efforts into mentoring, colleagues with average performance may achieve remarkable careers; in contrast, we have observed numerous times that high-potential colleagues trying to set up a working group without a mentor exhausted themselves and achieved little before finally leaving a given institution disillusioned and completely disappointed.

PROFESSIONAL PLAN

When residents start their professional careers, they are usually eager to prove themselves both clinically and scientifically so that they may have a productive career. In many European residency systems, this is fueled by university contracts that require, in part, substantial scientific activity during residency to get a contract extended beyond board certification. However, this approach often results in severe disappointments or even substantial fatigue if time and energy between clinical and scientific components are not carefully balanced by a mentor in close cooperation with his mentee. In our experience, if a mentee is on the clinical scientist path, the first 6 months of residency should be strictly reserved for clinical education so that the mentee can work on call and weekend nights and be somewhat secure with the most basic anesthesiology procedures. Advancing the scientist/academic side can best be described as a 'walk before you run' approach to allow the mentee to experience some early success. Early success is validation that the mentee does indeed have something to offer as assessed by those in the broader scientific community. In our experience, a step-by-step approach that has worked is to start off simple, for example, with a few case reports, and then carry on with several smaller research projects (ideally not requiring IRB paperwork), all

with the goal of achieving publication in any journal. This is to establish experience in literature review, writing protocols, grant applications, and manuscripts, but most importantly for the joy of experiencing success. If, in contrast, receiving IRB approval or completing data collection for a resident project takes an entire year, disappointment is very likely as the subsequent time for data analysis, writing, and manuscript submission and revision may place any publication date several years after initiation of the project. Such a schedule would dishearten most. As an example of the former approach, we had a junior resident measure head angle during mask ventilation in volunteers to develop a ventilation mask that signals to a rescuer the best angle for ventilation in an unprotected airway. This was an ideal resident project as there was no requirement for IRB approval or a budget, and the resident collected the data in a single day during a county fair in his hometown by putting 102 volunteers on a stretcher and taking digital photos from a defined angle to measure the head angles. The project was not only the first original contribution from this resident, but it was also published in a highly respected journal [18]. From this experience, this resident recognized that he could convert his personal scientific interest into valuable research and published another 100 peer-reviewed articles over the next 10 years before becoming chair in a regional hospital. Similarly, two other junior colleagues joined our group when our animal research laboratory was highly active, which enabled the rapid conduction of experiments within 2–3 weeks, followed by publication. Thus, one resident was able to collect data on an animal experiment early during residency, publish it in an international peer-reviewed journal [19], and carry on with another 50 articles over the next 10 years. Another resident published the results of an animal experiment within months of entering residency in one of the highest ranking journals in our field [20] and published another 45 articles over the next 13 years. They also went on with administrative and mentoring roles and are just a few of many examples to show how early, guided success can help jump-start young colleagues. One recurring theme is learning how to start a mentee's science by asking simple questions with guaranteed answers and having a mentor make sure you in fact asked a decent question.

The key in all these careers is not complicated – a productive working group led by a mentor who guides everyone's efforts with substantial cross-fertilization of ideas and interests among group members to maximize success. As investigators from the USA pointed out [21], 'a senior investigator with a high h-index who does not involve and mentor

the next generation of investigators will not provide as great a legacy to the specialty as will an investigator with a low h-index who has actively passed on both the tools and the passion to counteract the sacrifices required for an investigative career.'

CHALLENGES

The degree, sources, and variability of challenges can be confounding. To begin with, the lack of mentors willing and able to devote substantial time and energy to mentees is limiting in many institutions [22]. In one study [23], the ideal mentor was described as 'admirable personal qualities, including enthusiasm, compassion, and selflessness; act as a career guide, offering a vision but purposefully tailoring support to each mentee; make strong time commitments with regular, frequent, and high-quality meetings; support personal/professional balance; and leave a legacy of being a good mentor through role modeling and instituting policies that set global expectations and standards for mentorship.' An individual with these skills will most likely have many responsibilities in any given department; it is therefore given that strong departmental support and commitment is needed to provide high-functioning, quality mentors. A common problem between mentor and mentee is differing expectations about the speed with which a particular project is being conducted. This can usually be solved by mutually agreeing on milestones and updating or recalibrating them as needed – what a business plan would call deliverables and a timeline. Another challenge occurs when unexpected changes in career plans or personal/health problems develop that preclude continuing a project. In our experience, preset rules and mutual agreements are a most valuable strategy to solve these issues if they occur. As an example, in only very rare cases will an ongoing project be completed by a young investigator from a new job elsewhere. In such cases, it is best to agree that the first author position and the master database remain in-house to ensure success and data integrity, while the leaving colleague remains on the author list but shifts from first to second. The mentor is key in smoothing these discussions, especially when no immediate agreement can be achieved. There are other delicate potential problems about research money and debates about authorship order when circumstances can be blurred. These are situations that need to be solved by the mentor of the research group if rules were not set up in advance.

A luxury problem that occasionally surfaces is that when a mentee does not appreciate or acknowledge his/her good fortune in being professionally mentored. Being mentored should

foreshadow that the mentee mentors others junior to him or her; this plan is not only the way to continue mentoring, but it is also invaluable to ensure the ongoing success of the working group and the department [24]. If a mentee insists on 'cherry picking', it should be addressed and rules should be enforced to avoid the development of completely self-oriented colleagues who will leave nothing behind when they move elsewhere.

One unexpected drawback to mentoring is that it emphasizes performance, which may not correlate with obtaining the best subsequent positions in an environment in which patronage is most important, as described in one German study [25].

KEEPING THE MENTEE AS A COLLEAGUE

A clinical scientist's career and academic progression are determined in no small part by scholarly publications in addition to fulfilling local department requirements for progression through the academic ranks. It remains a challenge for many who are academically highly accomplished to pair that with a similar level in clinical service. An individual spending a significant portion of time in a basic science laboratory is often unable to build up clinical experience at the same rate as a more clinical counterpart, thus scientific and clinical expertise may be unbalanced. It is thus one of the mentor's other important tasks to ensure that the mentee does not fall behind his/her peers in clinical experience when conducting research. It is in fact the mentor's obligation to ensure adequate clinical rotations and performance for his mentee [26]. Further, any mentee should be expected to ask, 'What am I going to get for all this?' In our experience, if the answer and subsequent rotation are not properly explained and conducted, the most important motivator for working beyond schedules vanishes quickly [27]. If a certain performance is not rewarded (protected time and favored clinical rotation seem most important, money is probably the least important), it will disappear over time. It is important to remember that junior colleagues presenting their work at scientific conferences benchmark their situation with other institutions and may quickly move elsewhere if they are not happy at home or get more substantial promises from another department. If mentor and mentee enjoy a professional interaction and jointly achieve success, they will describe their environment during scientific conferences or in social networks. This will in turn attract others with high potential to their institution. In addition, the mentee will feel a loyalty to his/her mentor and will be less likely to move to a different institution.

With social networks being present on virtually every mobile phone, success or problems travel almost instantaneously through chat groups. Of the medical students we have mentored, many of them schlepped their friends into our laboratories where we put them to work; two-thirds later became anesthesiologists, thus reflecting how important it is to foster young academics in our specialty. Later 'marketing efforts' toward our discipline become much more expensive and difficult because the high-potential talents will have largely made up their minds to go elsewhere. Similar to the adolescents at home moving to college, the day will come when the mentee will move elsewhere, preferably due to a challenging job offer. In an ideal case, the relationship between mentor and mentee will continue, and a cross-institution network develops that again fosters new ideas, projects, collaborations, and manuscripts [28**].

CONCLUSION

Access to a mentor is an often-cited key to choosing a specialty and the success of junior colleagues and thus the entire department. Mentoring is fundamentally valuable in providing role modeling and also in protecting the mentee from the inefficiency of learning lessons the hard way.

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Conflicts of interest

There are no conflicts of interest.

REFERENCES AND RECOMMENDED READING

Papers of particular interest, published within the annual period of review, have been highlighted as:

- of special interest
- of outstanding interest

1. Smith RH, Cullen SC. One method of teaching anesthesia to medical students. *Anesthesiology* 1963; 24:68–71.

2. Abdulghani HM, Al-Shaikh G, Alhujayri AK, *et al.* What determines the selection of undergraduate medical students to the specialty of their future careers? *Med Teach* 2013; 35 (Suppl 1):S25–S30.
 3. Nwasor EO. Perception of final-year medical students about choice of anaesthesia as a specialty. *Niger J Med* 2010; 19:208–213.
 4. Kumar R, Dhaliwal U. Career choices of undergraduate medical students. *Natl Med J India* 2011; 24:166–169.
 5. Minai F, Ul Haq MI, Afshan G. A survey of undergraduate anesthesia rotation in medical colleges of Pakistan. *J Anaesthesiol Clin Pharmacol* 2014; 30: 82–85.
 6. Rosenberg H. Anesthesia orientation for the medical student. *Anesth Analg* 1975; 54:328–331.
 7. Bruhn JG, Epstein BS, Burnap TK. Senior medical students' knowledge of and attitudes toward anesthesiology in ten medical schools. *Anesthesiology* 1973; 39:94–103.
 8. Gravenstein JS, Rhoton MF. Teaching anesthesia to undergraduate college students. *Anesthesiology* 1972; 37:641–646.
 9. Hutton P, Cooper GM. Careers in anaesthesia. *Br J Anaesth* 2005; 95: 284–286.
 10. Landauer B. Anästhesie – was denn sonst?! 10 gute Gründe Anästhesistin, Anästhesist zu werden. *Anästh Intensivmed* 2009; 50:4–6.
 11. Stringer MD, Ahmadi O. Famous discoveries by medical students. *ANZ J Surg* 2009; 79:901–908.
 12. Liu EH, Lee TL. The teaching of anaesthesia in Singapore. *Ann Acad Med Singapore* 2005; 34:140C–142C.
 13. Schmidt CE, Moller J, Schmidt K, *et al.* [Generation Y: recruitment, retention and development]. *Anaesthesist* 2011; 60:517–524.
 14. Todd MM. Thank you Larry! *Anesth Analg* 2014; 119:1230–1231.
 15. Shafer SL. Thank you, Larry Saidman! *Anesth Analg* 2014; 119:1227–1229.
 16. Saupé RL. The good doctor: ode to a mentor and a friend. *Anesthesiology* 2013; 118:743–746.
 17. Gabrielli A, Wenzel V, Layon AJ, *et al.* Lower esophageal sphincter pressure measurement during cardiac arrest in humans: potential implications for ventilation of the unprotected airway. *Anesthesiology* 2005; 103:897–899.
 18. Paal P, von Goedecke A, Brugger H, *et al.* Head position for opening the upper airway. *Anaesthesia* 2007; 62:227–230.
 19. Krismer AC, Lindner KH, Kornberger R, *et al.* Cardiopulmonary resuscitation during severe hypothermia in pigs: does epinephrine or vasopressin increase coronary perfusion pressure? *Anesth Analg* 2000; 90:69–73.
 20. Stadlbauer KH, Wagner-Berger HG, Raedler C, *et al.* Vasopressin, but not fluid resuscitation, enhances survival in a liver trauma model with uncontrolled and otherwise lethal hemorrhagic shock in pigs. *Anesthesiology* 2003; 98:699–704.
 21. Wenzel V, Idris AH, Banner MJ, *et al.* The composition of gas given by mouth-to-mouth ventilation during CPR. *Chest* 1994; 106:1806–1810.
 22. Gravenstein N, Rollman JE, Berryessa RG, Slogoff S. The oxygenator arterial sampling port: a potential source of error. *Anesthesiology* 1985; 62:825–826.
 23. Voelckel W, Wenzel V, Rieger M, *et al.* Temporary extracorporeal membrane oxygenation in the treatment of acute traumatic lung injury. *Can J Anaesth* 1998; 45:1097–1102.
 24. Ward DS, Wu CL. Don't forget mentoring. *Anaesthesia* 2012; 67:186–187.
 25. Kovacs AF. Patronage und Geld. Entschliessungsmechanismen bei der Besetzung von Lehrstühlen am Beispiel einer wissenschaftlichen Teildisziplin in Deutschland. *Berlin J Soziol* 2010; 20:499–526.
 26. Flexman AM, Gelb AW. Mentorship in anesthesia: how little we know. *Can J Anaesth* 2012; 59:241–245.
 27. 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; 124:453–458.
 28. Miller DR, McCartney CJ. Mentoring during anesthesia residency training: ■ challenges and opportunities. *Can J Anaesth* 2015; 62:950–955.
- The only recent reference to this very important topic; very nicely written.