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## Lessons in mentoring

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### Abstract

Mentoring is an essential catalyst for a successful medical career in science or clinical practice. In recent years, tools have been developed to measure the impact of mentoring on career achievements, and numerous models have been developed to improve mentor training. Sid Gilman, M.D., F.R.C.P., Chair of Neurology for 26 years at the University of Michigan, is well-recognized as a role model for mentors in neurology across the country. We report the result of a survey of his former trainees on the valuable aspects of his mentoring style. A review of the current mentoring literature, including suggested training programs for mentors, is also provided.

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### Introduction

#### *Definition of mentoring*

The modern definition of a mentor in the Oxford English Dictionary 2000 is “an experienced and trusted counselor.” Education about the road to professional advancement is only one of the mentor’s roles. Mentoring is a long-term relationship with a responsibility to provide the support, knowledge, and impetus that can facilitate professional success. Another helpful definition of medical mentoring is “a personal process that combines role modeling, apprenticeship and nurturing” (Ricer, 1998). A mentor is “a person to trust and respect with whom trainees can discuss all aspects of their professional life” (Bulstrode and Hunt, 2000). The relationship often provides some benefit to both participants in terms of opportunities for reflection and collaboration and can be viewed as a partnership (Bhagia and Tinsley, 2000), with the shared primary goal of supporting the mentored person. A good mentor first spends time exploring the desires and needs of the protégé. The best relationships begin with a frank discussion of the variety of available practice

settings and academic paths, and from there the mentoring partnership can begin to focus on more precise objectives.

Most definitions of mentoring stress the importance of a personal connection that goes beyond the usual student–teacher relationship—“for wisdom to be imparted, there has to be a special bond between the wise person and the one who would choose to become wise” (Hollingsworth, 2002). The word mentor originally derives from the fictional character Mentor in Homer’s *Odyssey* who educated and shaped the ethical character of Telemachus during his transition to manhood. A mentor is an advisor that serves to facilitate both personal and professional development. A thoracic surgeon recently described the ideal mentoring process as “setting an example in demonstrating the characteristics of a good doctor, and a good human being, and teaching absolute honesty” (Loop, 2000).

A true mentor fulfills a variety of roles in the professional development of the medical apprentice. The Council of Graduate Schools has defined a mentor by alluding to each of the functions they are expected to perform: “Advisors, people with career experience willing to share their knowledge; supporters, people who give emotional and moral encouragement; tutors, people who give specific feedback on one’s performance; masters, in the sense of employers to whom one is apprenticed; sponsors, sources of information about and aid in obtaining opportunities; models of identity,

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of the kind of person one should be” (Zelditch, 1990). Clearly most mentors will not be able to excel at each role. Temperament as well as circumstance will dictate that individuals are inclined to provide and accept more of one type of assistance rather than another. However, a good mentor must give consideration to all of the functions that could be performed as part of this role to determine what will be most helpful to his individual protégé.

### *Purpose of mentoring*

Mentoring is often perceived as the natural outcome of interactions between senior and junior faculty in the same profession. For many years, mentors have been expected to (a) define possible career paths and provide insight about the general processes that would lead to professional advancement, (b) provide direction by validating specific goals directed toward achieving the trainees long-term plans, and sometimes (c) pass on the knowledge and techniques needed to allow the mentee to extend the work started by the mentor. The recent interest in measuring has arisen from a discussion of how mentoring could help achieve several other important outcomes for medical training programs.

Mentoring has been seen as a necessary tool to encourage the development of clinical and basic scientists in medicine. The NIH recognized a decline in the number of physicians applying for clinical research grants from 40% in 1970 to 25% in 1998 (Nathan, 1998). As a result, new clinical grant awards including partial salary support for mentors were established. In a survey of 1302 junior medical school faculty in 1998, those with an active mentor rated their research preparation and research skills significantly higher than those without a mentor (Palepu et al., 1998). A survey of 2879 emergency medicine residents indicated that interest in an academic career was correlated with more available role models and mentors (Neacy et al., 2000). Mentoring is also seen as critical for the advancement of science in internal medicine, pediatrics, primary care, and gynecology (Frohlich, 2000; Committee on Pediatric Research, 2001; DeWitt et al., 1998; Rock, 1999). Even government agencies have begun to recognize the powerful role of mentoring in research by providing yearly Presidential Awards to mentors in mathematics, science, and engineering (anonymous editorial, 2003). It has become widely accepted that improving the quantity and quality of mentors will enhance recruitment, retention, and success of medical scientists.

Mentoring is also perhaps the best means to achieve the level of professional ethical conduct modern medical training seeks to instill in young trainees. Medical schools have made a sincere effort to teach communication, humanism, and ethics in didactic courses. Mentoring, unlike formal education, includes exposure to a personal model of the application of a professional code of ethics in immediately relevant situations. It has been suggested that the “tacit

knowledge” required for functioning as a team member, providing patient centered care, and applying personal values to professional actions cannot be explicitly taught and are best learned through a mentor (Epstein, 1999). Education can impart awareness of the standards of conduct, but only a mentoring relationship can explore the sacrifices and rewards of the most altruistic behavior.

Finally, mentoring has been recognized as a way to improve the success of those perceived as disadvantaged minorities in the medical system, perhaps by improving access to academic careers. Women remain a minority among successful medical school faculty. In 2001, 45% of medical students were women and 28% of medical school faculty members were female. Only 14% of tenured faculty, 12% of full professors, and 8% of department chairs were women (Bickel et al., 2002). A survey of 36 department chairs indicated that the majority of chairs felt that inadequate mentoring was a substantial reason for gender disparity; the majority also felt that developing mentoring programs for women would be among the most effective strategies for change (Yedidia and Bickel, 2001). In 1998 the Office on Women’s Health (in the Department of Health and Human Services) created seven Centers of Leadership specifically to address the issue of improving mentorship and support for women (Mark et al., 2001; Morahan et al., 2001). In the neurosciences, a group founded to mentor women to leadership positions within the society for Neuroscience (Women in Neuroscience) has doubled in membership in the past 2 years (Haak, 2002). In many survey studies, the quality of mentorship for women is felt to represent more of a barrier than the absolute availability of mentors (Foster et al., 2000; Sonnad and Coletti, 2002; Lewis, 2003). For cultural minorities, there is perhaps an even stronger perception of bias: in one study of 4814 obstetrics and gynecology residents, 60% of the non-white group perceived a bias in mentoring favoring whites (Cain et al., 2001). Another group found that 78% of the minority students who graduated without delay had physician mentors, but only 23% of minority students who delayed or withdrew from medical school had physician advisors (Tekian et al., 2001). Improving the quality of mentoring seems to have the potential to improve the likelihood of success in these underrepresented groups.

### *Assessment of mentors and role models*

Most measurements of successful mentoring are made with carefully constructed survey instruments that try to capture the most important aspects of the faculty’s contribution. One controlled study comparing those named excellent role models with other members of the medical school faculty concluded that the factors that distinguished the best role models for medical students were (a) the comparative time spent teaching, (b) the degree to which the role model stressed the physician–patient relationship, and (c) how much they taught the psychosocial aspects of medicine

(Wright et al., 1998). In another study, students and faculty identified as role models were both surveyed without controls and agreed that the most important aspect of mentoring were developing clinical reasoning, as well as showing enthusiasm for their discipline and teaching in general (Ambrozy et al., 1997).

Using another survey instrument, administered to both medical students and residents, a Texas group found that trainees at different stages valued different abilities—medical students categorized their role models as outstanding didactic teachers, whereas the residents valued direct feedback and the ability to provide professional opportunities as much or more than education (Paukert and Richards, 2000). Training in professional behavior is also more valued at higher levels. The Objective Structured Clinical Examinations have undertaken to provide an assessment tool for professionalism and communication at the resident level, but faculty assessment tools for the ability to model professional behavior are still rudimentary, and recommendations are being made for enhancing these tools (Rubenstein, 2002; Murray et al., 2000). The support of a specific mentoring relationship is often not available at the resident level. One survey instrument sent to all U.S. physical medicine and rehabilitation residents identified a serious need for mentors: although 97% of the residents desired mentoring, only 28% had a mentor at the time of the survey (Gallicia et al., 1997).

At the faculty level, most studies show that at least 70% of faculty members feel that they have mentors. The overall features of an effective mentor at the faculty level have been defined in previous surveys to include (a) a teacher who enhances skills and intellectual development and provides useful feedback, (b) a sponsor or patron who facilitates entry into a field of study, (c) a guide to ethics and values in approaching different aspects of the career and professional conduct, (d) a personal supporter who understands the trainee's individual needs, and (e) someone who can evaluate the merits of new programs or ideas in the context of the field as a whole (Rock, 1999; Dunnington, 1996; Jackson et al., 2003). Distinguishing which features of mentoring are most important in creating scientists, retaining academic faculty, or enhancing scholarly productivity is still difficult. It is possible that studying case exemplars of excellent mentors might contribute to knowledge about the relative importance of various mentoring skills.

## Materials and methods

### *Hypotheses*

A postal survey was undertaken to try to discern the most important features of the mentoring provided by Sid Gilman, M.D., F.R.C.P. Respondents were informed that the results would be presented at the Gilman Symposium. In undertaking the survey, we intended to study the relation-

ship between Dr. Gilman's effectiveness as a mentor (as assessed by the protégé) and (a) the degree to which a personal relationship was established and the duration of the relationship, (b) the support for either clinical or academic interests, (c) the support for new endeavors not suggested by the mentor, (d) the teaching provided, and (e) the influence of Dr. Gilman on career choices or opportunities.

### *Gilman mentoring survey*

The survey instrument was mailed to all resident and faculty trainees of the University of Michigan during Dr. Gilman's tenure for whom addresses were available. Former faculty and residents were asked to anonymously answer the following 10 questions and respond on a scale of 1–5 where 1 = strongly disagree, 2 = agree, 3 = neutral, 4 = agree, and 5 = strongly agree. (1) I consider Dr. Gilman to be one of my mentors in Neurology (trainees who answered 1 or 2 to this question did not consider Dr. Gilman to be a mentor and were deleted from the survey). (2) Dr. Gilman took a personal interest in my growth and development. (3) Dr. Gilman supported my clinical interests. (4) Dr. Gilman supported my academic interests. (5) Dr. Gilman supported my efforts to begin new endeavors with as yet undetermined value (financial or academic) to the department. (6) Dr. Gilman's direction of the teaching program enhanced my training. (7) Dr. Gilman's personal teaching enhanced my training. (8) Dr. Gilman positively influenced my long-term career choices. (9) I consider Dr. Gilman to be a very effective mentor. (10) How many years did you spend at Michigan? Faculty were also asked to complete an open-ended question about other mentors and were given an opportunity to provide additional comments on Dr. Gilman's mentoring.

The data were analyzed with two-tailed paired *t* tests for selected hypothesized correlations.

## Results

### *Demographics*

A total of 151 surveys were mailed or placed in departmental mailboxes. Seventy-seven surveys were returned and completed (51%). Thirty-eight of the responses also included open-ended comments about the value of Dr. Gilman's mentoring. Two of the respondents were excluded as they strongly disagreed that Dr. Gilman served as a mentor during their training. The remaining answers were entered into a database and analyzed as described above.

### *Survey*

The mean ratings for each of the mentoring skills were consistently very high across all questions (Table 1). There were respondents who felt comfortable expressing negative

Table 1

Question	Mean (1–5 scale)	Standard deviation
Personal interest	4.54	0.73
Support clinical interests	4.48	0.73
Support academic interests	4.65	0.63
Support new endeavors	4.36	0.81
Direction of teaching program	4.63	0.61
Personal teaching	4.71	0.59
Influence career choices	4.26	1.02
Effective mentor	4.67	0.73
Years at Michigan	6.23	4.69

opinions—each category except the categories for teaching and supporting academic interests included two to six individuals who responded negatively. The highest positive rating was 4.71 (SD 0.59) for Dr. Gilman's personal teaching within the program. The next highest score was for overall effectiveness as a mentor (question 9) at 4.67 (SD 0.73). The lowest mean score was in the ability to positively influence career choices with a value of 4.26, and this question also had the largest standard deviation at 1.02.

The number of years in neurology at the University of Michigan averaged 6.23 with a standard deviation of 4.69.

### Correlations

The data were analyzed for possible correlations between several of the aspects of mentoring and being rated an effective mentor overall (Table 2). The highest correlation was between the likelihood of positively influencing career choice and the effectiveness of mentoring. Very similar levels of correlation were seen for teaching ratings and mentoring. Significant correlations were also detected between mentoring and personal interest in protégé and between mentoring and support of clinical or academic interests. There was no correlation between the number of years at Michigan and the strength of mentoring, nor was there a correlation between effective mentoring and support of unproven endeavors.

### Comments

The open-ended comments also yielded important clues to the most influential aspects of Dr. Gilman's mentoring style. The 38 comments can be divided into several broad categories. The most commonly cited valuable mentoring attribute was the ability to serve as a role model, indicating that they would like to emulate both his skill as a neurologist and his personal qualities of integrity, honesty, and fairness (16 comments). Thirteen respondents commented on his ability to provide access to knowledge about the field or about professional advancement. Nine individuals specifically mentioned Chairman's rounds, during which the Chair is both teaching and accessible. Finally, several comments expressed gratitude for directing the path of their

future career and a few commented specifically on the value of their personal relationship with Dr. Gilman. One representative and informative example of the comments follows: "Dr. Gilman reliably encouraged his residents to think critically, comprehensively, and compassionately. Chairman's report, although excruciatingly painful as a first year resident, did more to develop my ability to 'think like a neurologist' than did any other aspect of my training. He expected excellence and somehow made us succeed in ways I don't believe any of us expected of ourselves when we started the program."

### Discussion

Dr. Gilman has served as a mentor for four neurology department chairs, two of whom are women. He has mentored many faculty now teaching at other institutions around the country, including 17 professors, 9 associate professors, and 17 assistant professors. He has also mentored many superb clinicians, medical students; young neuroscientists, and interdisciplinary colleagues. His education and mentoring skills have been recognized in many venues; he has most recently been named as the recipient of the AB Baker Award for education in neurology, to be presented by the American Academy of Neurology in 2004. Our survey was undertaken to try to measure the features of his success. The results may, of course, be biased by association with the symposium honoring his achievements, and the large minority who did not reply may certainly have had more negative opinions than those who answered. Nevertheless, in an anonymous survey, the ratings for his mentoring skills were exceptionally high across all measures. Respondents seemed most impressed by his knowledge and educational skills. Although Dr. Gilman is clearly a consummate academic, his support for clinical and academic goals was nearly equal, implying that he individualized his support to each trainee's needs. The comments particularly emphasized his success as a role model for professional and personal integrity. Given the high and nearly equal ratings for various aspects of mentorship, it is difficult to say which of these attributes contributed most to his success. Another

Table 2

Correlation between effectiveness as a mentor and aspect of mentoring	Pearson correlation	Significance (two-tailed), $p <$
Years at Michigan	-0.075	NS
Personal interest	0.482	0.001
Direction of teaching	0.605	0.001
Personal teaching	0.571	0.001
Support my clinical interests	0.442	0.001
Support my academic interests	0.453	0.001
Support new endeavors	0.251	NS
Influence career choice	0.675	0.001

unanswered question is whether these qualities can be taught to aspiring educators and mentors or whether they are simply part of the innate skills and temperaments of a few gifted individuals.

### *Teaching mentoring*

As it becomes increasingly clear that effective mentoring is correlated with success, many attempts have been made to extend the quantity and quality of mentoring. Raising awareness of the importance of good mentoring among graduate students has made them better informed partners. The journal *Science* has attempted to disseminate data on the importance of mentoring from sources including the Institute of Medicine, the National Academy of Sciences, and the National Science Foundation through a website called “Next Wave” (Gonzalez, 2001). Medical schools and departments have developed a number of innovative programs that focus on meeting mentoring responsibilities in innovative ways. Attempts have been made to provide formal education to faculty through collaborations with affiliated schools of education (Hitchcock, 2002) or humanities (Gilkinson, 2003). In the United Kingdom, requirements have been set up for clinical tutors and mentors to participate in formal focus groups and network with one another (Connor et al., 2000). Major institutional efforts are being developed in many sites to codify the expectations for junior faculty mentoring (Cupples, 1999) and provide helpful role playing and faculty instruction (Marks, 1999; Maudsley, 2001). At the University of California in San Diego, Hahnemann and Meharry, new programs were established to help women and minorities gain access to mentoring and to reward the mentors (Mark et al., 2001). Institutional efforts have also been made to clarify promotion requirements and early professional expectations to remove part of the individual mentor’s burden (Neiman et al., 1997; Rubenstein, 2002). Papers and courses on manuscript and grant writing are also more widely available to help supplement the support of mentors (Lemkau, 1999).

Advocates of improved mentoring have suggested that an increase in the amount of bedside teaching would improve role modeling in medical school and residency (Wright et al., 1998; LaCombe, 1997) and allow students to understand issues of professionalism through spontaneous discussion of real issues (Swenson, 1996). Others advocate stressing medical ethics early in training evaluations, making evaluations of professionalism as pervasive as evaluations of knowledge or clinical skill (Rubenstein, 2002); residency education guidelines have reinforced the importance of evaluation by stressing ethics and communication. Efforts have been made to allow mentors to receive feedback from mentees at every level, perhaps anonymously, and including this as an integral part of the mentor’s record (Djerassi, 1999; Maudsley, 2001; Schindler et al., 2002). Finally, some departments are encouraging peer-group

mentoring—junior faculty provide professional information to each other and share experiences with the added benefits of enhanced collaboration and support among the group (Pololi, 2002).

### *Mentoring everyone*

Despite a substantial focus on the importance of mentoring, challenges remain in providing professional support to all trainees. In the neurosciences, only 20% of academicians have obtained federal funding and can provide advanced academic mentoring to junior faculty (Griggs, 1994). Even in terms of post-residency fellowships in neurology, it has been estimated that 10% of all neurology programs offer 80% of the fellowship experiences (Griggs et al., 1987). Current faculty time and rewards for mentoring activities remain limited (Connor et al., 2000). Ethnic minorities and women still often feel isolated and are less likely to be satisfied by mentoring relationships (Bickel et al., 2002). Furthermore, for one reason or another, the best role models in academic medicine often do not remain in one institution long enough to provide the most effective longitudinal mentoring. In one study, 50% of those receiving teaching awards between 1977 and 1999 at Case Western University left within 3 years of receiving the award (Aron et al., 1999). Finally, although the principles of professional conduct and academic investigation do not change, the information age has brought new scientific advances and new funding opportunities at a pace that none but the most astute mentors can keep pace with. One institution has undertaken the exercise of using computer simulations of medical science as it was 20 years ago to illustrate the importance of lifelong learning to its trainees (Wallach et al., 2002).

Mentors who have proven themselves capable of hurdling all these barriers are indeed rare. There is some hope that renewed focus on the importance of mentoring will generate training and evaluation programs to allow mentors to achieve their full potential. The ideal mentor and role model was described many years ago by Aura Severinghaus in the *Archives of Neurology*, but that 1967 description still seems comprehensive today. His ideal mentor possesses “a generous measure of intellectual ability, integrity, both personal and social, honesty so obvious and crystal that someone has called it ‘transparent integrity,’ a passion for truth, a motivation that makes social sense, emotional stability, the habit of working under his own drive, a capacity for growth, curiosity, the ability to respond with imagination and creativity to new or challenging situations, tolerance of the differences among people and reverence for life, personality and the dignity of man.” In my opinion, this is an excellent description of the mentoring provided by Dr. Sid Gilman during his 26 years as Chair at the University of Michigan.

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