Supplemental Materials for Hindman BJ, Dexter F, Todd MM: Research, education, and nonclinical service productivity of new junior anesthesia faculty during a two-year faculty development program. Anesth Analg 2013

Supplement I. New Faculty Program Advisor Characteristics

During the first year, one Advisor left the department and one withdrew from the program. Replacement Advisors were assigned from the existing group of Advisors. At the start of the second year, 3 of 40 (8%) new faculty-Advisor pairs were reassigned. During the second year, two other Advisors left the department. Replacement Advisors were assigned from the existing group of Advisors. As a result, by the end of the second year, 7 of 20 (35%) new faculty had one of their original Advisors reassigned, and 2 of 20 (10%) both of their original Advisors reassigned. Thus, of the 40 originally assigned new faculty-Advisor pairs, 29 (73%) were maintained throughout the entire two years of the program.

During the two years of the program, senior faculty served as Advisors for one new faculty (8 Advisors), two new faculty (7 Advisors), three new faculty (3 Advisors), four new faculty (4 Advisors), or five new faculty (2 Advisors). During the two years of the program, four of 24 (17%) Advisors had external funding at the R01 level and four (17%) had major editorial responsibilities for anesthesia journals. Advisors were not provided with additional resources (non-clinical time, salary, *etc*.) to meet their program responsibilities.

As shown in Table 1 of the primary manuscript, compared with the new faculty, Advisors were more commonly male and had more commonly graduated from North American medical schools and/or residencies. Approximately 20 years separated new faculty and their Advisors, both in term of chronological age and in years since completion of training.

Supplement II. New Faculty Program Seminar Interest, Attendance, and Evaluations

	Seminar Topic Interest[a]	Seminar Attendance[b]	Seminar Evaluation Score
First Year Topics			
Working in chaos: Organizing your work and time	[c]	55%	4.1±0.5
Designing effective visual aids	4.3±0.8	75%	4.8±0.1
Writing for publication, part 1	4.3±1.1	95%	4.9±0.1
Writing for publication, part 2		75%	
How to read and assess a clinical research paper	[c]	80%	4.9±0.2
Speaking skills, didactic	4.2±1.2	58%	4.9±0.1
Speaking skills, workshop	4.0±1.2	58%	
CVs, cover letters, personal statements	4.0±1.1	42%	4.7±0.3
Clinical teaching, part 1	4.0±1.4	45%	4.9±0.1
Clinical teaching, part 2		55%	
Second Year Topics			
Writing letters of recommendation	4.3±1.0	70%	4.9±0.1
Introduction to conflict and emotional intelligence	3.9±1.0	95%	4.8±0.2
Serving as a coach to a junior colleague	4.2±1.0	90%	4.4±0.3

Conflict management styles	3.8±1.1	75%	4.9±0.2
Communication skills	4.2±0.7	70%	4.5±0.2
Difficult conversations	[d]	75%	4.7±0.1
Getting things done®	3.9±1.2	50%	4.7±0.2
Communicating with patients regarding adverse events	3.9±1.0	60%	4.8±0.2
Reviewing an article submitted to a journal	4.0±0.9	55%	4.7±0.2

Seminar topic interest and seminar evaluation scores are presented as mean ± SD; maximum value =5.0. Seminar attendance is presented as percentage of new faculty who attended. Seminars are shown in the order in which they were presented.

a Mean interest score of all new faculty. At the start of the first year, topic interest scores were provided by 22 faculty, including two faculty who left the program during that year. At the start of the second year, topic interest scores were provided by 22 faculty, including two other new faculty who joined the program in its second year.

b Attendance data are for the 20 faculty who remained in program for whole two years. Attendance of two faculty who left the program in the first year and two other new faculty who joined the program in the second year is not included. Over the two years of the program, omnibus seminar attendance (20 faculty, all presented seminars [n=16]) was 69%. Median individual faculty attendance was 70% (25^{th} to 75^{th} interquartile range = 57% to 78%).

c Additional topic selected by the Vice-Chair.

d Seminar topic added by the speaker to integrate prior presentations.

e Optional weekend course in which attendance was counted but not expected.

Supplement III. New Faculty Program Goals

Our faculty development program required new faculty and their Advisors to identify specific goals for the new faculty to achieve within a defined time frame. Faculty and their Advisors were aware that periodic reports and formal presentations were required which focused on progress toward these goals. Therefore, practically speaking, our new faculty development program was "project" oriented.(Thorndyke 2006) The mentorship provided likely often centered on new faculty goals and the timelines to accomplish them. Gusic *et al.* have suggested that project oriented faculty development and "functional mentoring" is a particularly effective approach because junior faculty: 1) develop specific knowledge and skills, 2) identify a career focus, 3) generate scholarship, 4) learn to allocate time to academic activities, and 5) develop collaborative relationships.(Gusic 2010)

New faculty who had appointments predating the start of the program (n=15) had the same program goals as faculty whose appointments started with the onset of the program. To avoid "penalizing" the former group, all accomplishments consistent with program goals that had been attained prior to the start of the program (July 1, 2009) were considered to count toward meeting program expectations. This decision was made with the understanding that it was possible for some faculty to have accomplished minimum expected program goals prior to the formal onset of the program. Strictly speaking, such faculty would not need to accomplish any program goals in the next two years to meet program expectations. However, this did not happen.

Specialized Training/Skills

The aim of the specialized training/skills goal was to establish the expectation that faculty would continue to increase their professional capacity. Of the 15 new faculty who had been in the department prior to the start of the program, 7 (47%) met the training/skills expectation prior to the start of the program (1.0-2.5 goals), and 7 others (47%) met the training/skills expectation during the subsequent two years of the program (1.0-2.5 goals).

Primary and Secondary Goals

Primary and secondary program goals were consistent with activities considered by the University of Iowa as contributing toward promotion. At the University of Iowa, there are two academic tracks—tenure and clinical. In the tenure track, promotion is earned by traditional scholarly activities—independent research resulting first authored publications in peer reviewed journals, most often supported by external funding. In the clinical track, promotion is earned by professional activities that demonstrate innovation and leadership in either educational or clinical activities. Although peer reviewed publications can contribute toward promotion in the clinical track, they are not required. The two tracks overlap in that, for both, promotion requires accomplishments in teaching and non-clinical (academic or professional) service.

While neither grant applications nor institutional approvals to conduct laboratory- or clinical- research are promotable activities *per se* at the University of Iowa, they are often prerequisites to accomplish investigation. Accordingly, these activities were included as program primary goals. Of the 15 faculty who had been in the department prior to the start of the program, 5 (33%) accomplished at least one primary program goal prior to the start of the program (1.0-3.0 goals), and 8 others (53%) accomplished at least one primary goal during the subsequent two years of the program (1.0-6.0 goals).

Because it can take years of professional effort to develop the infrastructure needed to attain a primary program goal, a series of secondary program goals were also defined which, if attained in sufficient numbers, could substitute for the primary goal expectation. Because teaching success is a required element for promotion in both the tenure and clinical tracks, a program aim was to encourage and reward faculty for teaching excellence. For this reason, teaching activities and success were included as secondary goals. To encourage non-clinical service activities, and to promote engagement in the department and college, secondary goals included clinical or educational administration, committee participation, and trainee mentorship. Of the 15 faculty who had been in the department

prior to the start of the program, 10 (67%) accomplished at least five secondary goals prior to the start of the program (5-24 secondary goals), and the other 5 faculty (33%) met secondary goal expectations during the subsequent two-years of the program (5.5-26.5 secondary goals). All ten (100%) faculty who met the secondary goal expectation prior to the start of the program accomplished additional secondary goals during the program (8.5-37.0 secondary goals).

Supplement III. References

1. Gusic ME, Milner RJ, Tisdell EJ, Taylor EW, Quillen DA, Thorndyke LE. The essential value of projects in faculty development. Acad Med 2010;85:1484-91.

2. Thorndyke LE, Gusic ME, George JH, Quillen DA, Milner RJ. Empowering junior faculty: Penn State's faculty development and mentoring program. Acad Med 2006;81:668-73.

Supplement IV. Assessment Instruments and Mentorship Assessment

Assessment Instruments

Unless otherwise specified, for all assessment instruments each question was answered using a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). Responses with values of 4 (agree) and 5 (strongly agree) were considered to be affirmative. All other values, including no response, were considered to be non-affirmative.

Program Effectiveness

The program assessment consisted of 14 questions. New faculty assessed the value of the program in the domains of clinical care, teaching, scholarship/research, service/administrative activities, and professional development (5 questions). With the exception of clinical care, these domains were those identified by Bland *et al*. as necessary for success in academic practice.(Bland 1990) New faculty also were asked: 1) to rate the value of the program in terms of defining and attaining their goals (3 questions), 2) whether the program provided expected resources (3 questions), and overall impression including whether the program was worth their effort (3 questions). Advisors were asked the same nine questions except that, for Advisors, questions were rephrased to be from the Advisor perspective.

New faculty were asked, "Over this last year, the New Faculty Program and Seminar Series, my Advisors, and other departmental programs and support have been of value to me: in defining my professional goals; in developing plans and strategies to meet my professional goals; in actually attaining my professional goals." Advisors were asked, "Over this last year, Dr. [*Advisee*] has done a good job in: defining their professional goals; in developing plans and strategies to meet their professional goals; in actually attaining their professional goals."

New faculty were asked, "Over this last year the department has provided me with: the non-clinical time I expected; the professional development resources I expected; the advice, counseling, mentorship and progress assessments I expected." Advisors were

asked, "Over this last year the department has provided Dr. [*Advisee*] with: an appropriate level of non-clinical time; an appropriate level of professional development resources; an appropriate level of advice counseling, mentorship, and progress assessments."

New faculty were asked, "The department has created an environment that aids, fosters, and supports my development; I understand what was expected of me as a participant in the New Faculty Program; the New Faculty Program and other departmental programs are worth the extra time that they require of me." Advisors were asked, "The department has created an environment that aids, fosters, and supports Dr. [*Advisee's]* development; I understand what was expected of me as an Advisor for Dr. [*Advisee*]; serving as an Advisor to Dr. [*Advisee*] was worth the extra time and effort it required of me."

Mentorship Effectiveness

The mentorship assessment consisted of 17 questions. The effectiveness of the mentorship relationship between new faculty and their Advisors was assessed using previously validated measures of mentorship quality (5 questions [Allen 2003]), and three specific mentoring functions: career mentoring (3 questions), psychosocial mentoring (3 questions) and role modeling (3 questions).(Pellegrini 2005) A final three questions were with regard to communication, availability, continuation of the relationship. New faculty and their Advisors were asked the same questions except that, for Advisors, questions were rephrased to be from the Advisor perspective.

New faculty were asked, "The relationship I have with my Advisor is very effective; I am very satisfied with the relationship I have with my Advisor; I effectively utilized my Advisor. Advisors were asked, "The relationship I have with Dr. [*Advisee*] is very effective; I am very satisfied with the relationship I have with Dr. [*Advisee*]; I was effectively utilized by Dr. [*Advisee*]."

New faculty were asked, "My Advisor takes a personal interest in my career; My Advisor helps me coordinate my professional goals, My Advisor devotes special time and

consideration to my career." Advisors were asked, "I take a personal interest in Dr. [*Advisee's]* career; I help coordinate Dr. [*Advisee's]* professional goals; I devote special time and consideration to Dr. [*Advisee]'s* career."

New faculty were asked, "I share personal problems with my Advisor; I exchange confidences with my Advisor; I consider my Advisor to be my friend." Advisors were asked, "I share personal problems with Dr. [*Advisee*]; I exchange confidences with Dr. [*Advisee*]; I consider Dr. [*Advisee*] to be my friend."

New faculty were asked, "I try to model myself after my Advisor; I admire my Advisor's ability to motivate me and others; I respect my Advisor's ability to teach and guide me and others. Advisors were asked, "I try to be a role model for Dr. [*Advisee*]; I try to motive Dr. [Advisee]; I try to teach and guide Dr. [Advisee].

New faculty were asked, "I communicate with my Advisor frequently enough to meet my needs; My Advisor is readily available for meetings and consultation; I want to continue to work with my Advisor for the next year. Advisors were asked, "I communicate with Dr. [*Advisee*] frequently enough to meet *their* needs; Dr. [*Advisee*] is readily available for meetings and consultation; I want to continue to work with Dr. [*Advisee*] for the next year.

Mentorship

The differences in age, gender, and societal and professional backgrounds between new faculty and their Advisors may have contributed to the relatively low level of psychosocial mentoring reported by both new faculty and their Advisors. On the other hand, these differences may also have contributed to the very high level of role modeling, particularly for the Advisors.(Allen 2006) Career mentoring and role modeling are not marked by emotional closeness, and that these mentorship functions can be well served without psychosocial mentoring.(Allen 2006) Other studies have shown that, although new faculty consider personal issues to be of importance, they often do not communicate them with their mentors.(Feldman 2010)

Allen *et al*. also reported that most measures of mentorship effectiveness are increased when: 1) mentees have input into the selection of their mentors, and 2) mentors have input into the selection of their mentees.(Allen 2006) In our program, new faculty-Advisor pairs were determined by program leadership rather than by the participating faculty. This may have decreased the initial effectiveness of some new faculty-Advisor pairs. Nevertheless, over time, it appears that, from the perspective of the new faculty, mentorship effectiveness increased. This is consistent with prior studies that observed, with formal mentorship programs, mentorship quality increases over time.(Allen 2003)

Wong and Stock reported that, in 2006, 28% of anesthesiology faculty in the United States were women.(Wong 2008) This value matches the overall percentage of women participating in our program when both the new faculty and Advisors are grouped together (13/44, 30%). Nevertheless, in our department, a much greater percentage of new faculty were women as compared to senior Advisors, 45% *vs*. 17%, respectively. Consistent with that difference, Wong and Stock reported that, in academic anesthesiology, women were less likely than men to hold the rank of full professor (6.5% *vs*. 17.7%, respectively; $P<0.001$).(Wong 2008) Therefore, in many departments, including ours, it may not be feasible for new women faculty to be mentored by senior women faculty, simply because of the relatively small numbers of the latter. An important question is the extent to which gender congruence affects mentorship quality. Wise *et al*. reported women faculty more often reported barriers to academic advancement than men (42% *vs*. 28%, respectively; $P<0.001$) and that the nature of the barriers differed markedly between the genders.(Wise, 2004) Because of these differences, women more often than men perceived that having a mentor of the same gender was helpful to academic advancement (27% *vs*. 3%, respectively, $P<0.001$).(Wise 2004) Nevertheless, in recent systematic reviews of mentoring in academic medicine, Sambunjak *et al.* concluded that there was not sufficient evidence to determine whether gender congruence affects mentoring efficacy.(Sumbunjack 2006; Sumbunjak 2009) Assessments of the program and mentorship did not differ

between our male and female new faculty, although our statistical power to detect a difference was low (data available upon specific request).

Supplement IV. References

1. Allen TD, Eby LT. Relationship effectiveness for mentors: Factors associated with learning and quality. J Manage 2003;29:469-86.
2. Allen TD, Eby LT, Lentz E. Mentorship behaviors and mentorship quality associated with formal mentoring programs: Closing the gap between research and practice. J Appl Psychol 2006;91:567-78.
3. Bland CJ, Schmitz CC, Stritter FT, Henry RC, Aluise JJ. Successful Faculty in Academic Medicine—Essential Skills and How to Acquire Them. New York, Springer Publishing Company, Inc., 1990.
4. Feldman MD, Arean PA, Marshall SJ, Lovett M, O'Sullivan P. Does mentoring matter: results from a survey of faculty mentees at a large health sciences university. Med Educ Online 2010;15: 5063 –DOI: 10.3402/meo.v15i0.5063.
5. Pellegrini EK, Scandura TA. Construct equivalence across groups: An unexplored issue in mentoring research. Educ Psychol Meas 2005;65:323-5.
6. Sambunjak D, Straus SE, Marušić A. Mentoring in academic medicine. A systematic review. JAMA 2006;296:1103-15
7. Sambunjak D, Straus SE, Marušić A. A systematic review of qualitative research on the meaning and characteristics of mentoring in academic medicine. J Gen Intern Med 2009;25:72-8.
8. Wong CA, Stock MC. The status of women in academic anesthesiology: A progress report. Anesth Analg 2008;107:178-84.
9. Wise MR, Shapiro H, Bodley J, Pittini R, McKay D, Willan A, Hannah ME. Factors affecting academic promotion in obstetrics and gynaecology in Canada. J Obstet Gynaecol Can 2004;26:127-36.