Identifying and Aligning Expectations in a Mentoring Relationship

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Abstract

The mentoring relationship between a scholar and their primary mentor is a core feature of research training. Anecdotal evidence suggests this relationship is adversely affected when scholar and mentor expectations are not aligned. We examined three questions: (1) What is the value in assuring that the expectations of scholars and mentors are mutually identified and aligned? (2) What types of programmatic interventions facilitate this process? (3) What types of expectations are important to identify and align? We addressed these questions through a systematic literature review, focus group interviews of mentors and scholars, a survey of Clinical and Translational Science Award (CTSA) KL2 program directors, and review of formal programmatic mechanisms used by KL2 programs. We found broad support for the importance of identifying and aligning the expectations of scholars and mentors and evidence that mentoring contracts, agreements, and training programs facilitate this process. These tools focus on aligning expectations with respect to the scholar's research, education, professional development and career advancement as well as support, communication, and personal conduct and interpersonal relations. Research is needed to assess test the efficacy of formal alignment activities. Clin Trans Sci 2011; Volume 4: 439–447

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Introduction

Effective mentoring is widely regarded as a key factor in assisting junior clinical and translational researchers to establish productive research programs and academic careers.[1,2]

The traditional model of mentoring involves pairing an aspiring junior researcher (the scholar) with an experienced senior investigator (the primary mentor). Even within an environment of interdisciplinary team mentoring, this dyadic relationship remains a core feature of mentoring within National Institutes of Health Clinical and Translational Science Award (CTSA) KL2 training programs.[3]

This relationship has two main functions: (1) a career (or role) function (i.e., the scholar "learns the ropes" of becoming a productive clinical/translational researcher); (2) a psychosocial function (i.e., the scholar's identity, competence and effectiveness in his/her professional role is enhanced).[1,4] Within this framework, Bland et al. further emphasize the dynamic nature of the relationship over time.[1] Applying the work of Zachary[5] to the academic setting, they describe four sequential developmental phases: preparing; negotiating; enabling; and closing the relationship.

A previous publication examined the first of these phases—the "preparing" phase—in which scholars and mentors learn about each other and enter into a mentoring relationship through informal (self-selection) or formal (programmatic matchmaking) mechanisms.[6] In this paper, we focus on processes involved in the second and third phases—the "negotiating" and "enabling" phases—in which scholars and mentors work together toward shared goals. In the context of this work, both scholars and mentors typically have expectations about what will be done, how it will be done, by whom, and when. Expectations may be specific or general in nature, shared or unilateral, and articulated or assumed.

Three questions were explored in this white paper. What is the value in assuring that the expectations of scholars and mentors are mutually identified (stated explicitly) and aligned (negotiated and reconciled when differences are recognized)? Assuming there is value in this effort, what types of programmatic interventions facilitate this process? Finally, what types of expectations are important to identify and align?

As a prelude to addressing these questions, several background considerations should be addressed. First, in *Table 1*, we define and distinguish the terms "goal," "milestone," and "expectation." Although the concepts embodied in these terms are related, the terms are not synonymous. To help differentiate them, we provide relevant examples of how each applies to the mentoring relationship.

Second, as part of the "preparing phase," scholars should have formulated their long-term career and professional goals (preferably in a written career development plan) and ensured that these goals are compatible with their personal aspirations and circumstances. Scholars should discuss their long-term goals with potential mentors as part of assessing the suitability of the scholar-mentor match (i.e., Does the mentor have the interest, background, resources, and commitment to help the scholar achieve his or her long-term goals?).[6] Once this broader preparation has taken place, discussions about specific expectations for the mentoring relationship can ensue.

Third, although we focus on the expectations that scholars and mentors have for one another, it is important to recognize that the mentoring relationship operates within a broader context. Institutions, schools and research training programs may have specific programmatic expectations for scholars and mentors. Some programs have well-developed strategies to implement these policies, monitor their use, and evaluate their effectiveness.[7] Other members of the scholar's mentoring team (if co- or secondary mentors or career mentors are involved) and research team may also have expectations of each other. Finally, funding organizations, particularly those that fund institutional research training programs (e.g., CTSA KL2 and TL1 programs), have an important influence through the mechanisms they specify as a condition for funding and/or that programs develop in an effort to obtain funding.

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		Example	
Term	**Definition[a]**	**Scholar**	**Mentor**
Goal (synonym: objective)	A result that one is attempting to achieve	To become an independent, productive investigator in a tenure track position at a major academic cancer center	To train a new investigator who can successfully conduct important research related to but distinct from my own area of research
Milestone (synonym: landmark)	An important event in a person's life or career	Submit my first R01 grant application	Submit my academic promotion materials with list of my mentees and their accomplishments
Expectation[b]	That which is expected (considered obligatory, required or reasonably due[c]) or looked for	My mentor will provide space, materials, and part-time research personnel resources to enable me to conduct my preliminary studies	My scholar is responsible for obtaining supplemental funding, as needed, for other research expenses.
		My mentor will provide helpful, expert guidance in completing and publishing my preliminary studies	My scholar will be diligent in completing and publishing his/her preliminary studies in a timely fashion
		My mentor will provide me with timely, constructive critique of the draft of my R01 grant application	My scholar will provide me with an advanced draft and sufficient time for me to provide constructive critique of his/her R01 grant application
		My mentor will practice mutual respect in our interpersonal relationship	My scholar will practice mutual respect in our interpersonal relationship

[a]Source: http://www.wiktionary.org/
[b]A person may have goals, milestones, and expectations for themselves or for another person. In the context of the mentoring relationship, we provide examples of goals and milestones that a mentee and mentor have for themselves and examples of expectations they have of each other in their collaborative effort to achieve their individual (but related) goals and milestones.
[c]From the definition of "expect."

Table 1. Definition of terms and examples.

To address the questions posed above, we used information from four sources: (1) a systematic review of the literature; (2) emergent themes from focus group interviews of scholars and mentors at four CTSA KL2 programs; (3) a survey of CTSA KL2 program directors; and (4) mentoring contracts and agreements used currently by CTSA KL2 programs. Anticipating that no single source would yield definitive answers, we sought to integrate information from all of these sources.

Methods

Systematic review of the literature

A medical librarian at the University of Wisconsin-Madison identified studies that examined mentoring using the PubMed database and the following search strategy: (mentor*) AND (faculty OR fellow* OR physician* OR CTSA). The search was restricted to the previous 15 years and to the English language: In addition, we reviewed the reference lists of published books and other systematic reviews,[1,2,8,9] and performed a similar search for recent publications from 2011. For identified publications, we performed a free text search for the word "expect" in the title, abstract and text of each publication. All publications identified as using the words "expect," "expected," or "expectation" were selected for further review, with the exception of those that used the word "expect" solely as a verb in relation to something other than a role, activity, or responsibility of the scholar or mentor. Each publication identified by these procedures was reviewed independently by two of four co-authors (WCH, KS, MB, JH), who abstracted the following data using a standardized collection form: lead author; year of publication; participants or setting; study design; results; and, additional reviewer comments. The data were compiled and reviewed by all of the study authors, and consensus was reached on studies that presented useful information regarding the questions posed by this investigation.

Focus group interviews of scholars and mentors in CTSA KL2 programs

Focus group interviews exploring factors affecting the success of mentoring relationships were conducted by a trained facilitator with scholars and mentors engaged in clinical and translational research at four CTSA sites (University of Wisconsin in Madison, Vanderbilt University, the University of Colorado Denver, and the University of North Carolina at Chapel Hill). A total of 55 scholars (33% KL2, 25% K08, 18% K12, 15% K23, 2% K01, 7% other) and 44 mentors were included. Group interviews with scholars and with mentors were conducted separately. The interviews were taped, transcribed, and entered into a qualitative database. The interview protocol was determined to meet federal criteria for exempt status by the University of Wisconsin-Madison Education Institutional Review Board.

Scripted questions were used to initiate discussion in the focus group interviews. The following questions were asked of scholars: "Thinking back to when you first entered into your current mentoring relationship, how did you come to understand/communicate the expectations your mentor had at the beginning of your relationship? How did you learn what you could expect of your mentor and what she or he expected of you? How do you know what is up to your initiative and what is up to your mentor? Who do you talk to when you are experiencing difficulties with your mentor? What recommendations do you have for raising difficult conversations with your mentor?"

The following question was asked of mentors: "Thinking back to when you first entered into your current mentoring relationship, how did you come to understand/communicate the expectations

your scholar had at the beginning of your relationship? The following questions were asked of both scholars and mentors: "Regarding mentoring contracts or agreements, what is your sense of their purpose? Are they accomplishing their purpose? In what ways were these instruments helpful in facilitating a conversation about expectations? In what ways could these instruments be improved?"

Survey of CTSA KL2 program directors

A survey of KL2 program directors at the 46 CTSA institutions that received CSTAs from 2006 to 2009 was conducted through a 30-minute semi-structured telephone interview, as previously described.[3] The survey assessed the use of formal programmatic mechanisms that support the following: communication of expectations for the mentor and scholar (e.g., policies and procedures, contracts, agreements, formalized meetings); evaluation of the mentoring relationship; and, efforts to train and support mentors.[3] Aside from the percent of programs using a mentoring contract (14/46, 30%) described previously,[3] the survey data presented in this paper has not been reported previously.

Review of mentoring contracts and agreements used by CTSA KL2 programs

Written policies and/or mentoring contracts and agreements used by KL2 programs were solicited from KL2 program directors who participated in the survey described above and from participants in online and phone survey of KL2 program directors at the 55 institutions that received CTSAs from 2006 to 2010 conducted by researchers at Columbia University during 2010–2011. We reviewed the documents from all of the eight CTSA institutions that submitted their documents voluntarily and gave permission for use, and the Association of American Medical Colleges' (AAMC) "Compact Between Postdoctoral Appointees and Their Mentors,"[10] to identify the types of expectations addressed in these documents.

Results

The value of identifying and aligning expectations

A total of 79 publications were identified that addressed mentoring in academic medicine. Of these, the free text word search identified 32 (41%) publications that addressed the topic of expectations in the mentoring relationship in some way.[2,7,9,11–39] Among the 32 publications, 17 were reviews or commentaries,[7,11–26] 5 were surveys or other analyses of mentoring,[2,9,27–29] and 10 evaluated mentoring improvement interventions.[30–39] The fact that nearly half of the publications addressed the topic of expectations in some way is evidence that this issue is regarded as important by a wide group of authors; however, no data were presented to quantify the extent to which programs or institutions require alignment of expectations or the degree to which doing so is helpful to scholars and mentors.

The importance and value of expectations was clearly evident from the focus group interviews with both scholars and mentors. Overall, scholars regarded a mentor's expression of his/her expectations of the scholar to be an essential element of effective mentoring, as succinctly stated by one scholar:

"Good mentors articulate what their expectations are of you."

The comment of another scholar, who was being co-mentored, provides additional insight because of the contrast he describes in the approaches of his two mentors:

"It's important to have them [expectations] written or spoken…I have two mentors. I have one…I don't know what that person wants from me. I try to tell him what I want from him, but…we don't communicate. Then my other mentor says flat out: 'These are my expectations of you. What do you expect of me? Let's work together so that we can both reach our goals.' That is a very productive, great relationship."

Scholars expressed multiple reasons why it is important to align their expectations with those of their mentor early in the course of the relationship. Specifically, scholars noted that this process helps to ensure that scholars receive what they need to be successful and provides them with clear guidance in their work. The following comments are illustrative of this viewpoint:

"So if you don't have expectations explicit up front, it makes it difficult to then go back and say, 'Are you getting what you need?'"

"I had a very directive mentor…, which was great for me… because I had no research experience, and [my mentor said] 'We're meeting once a week, and you're going have this done in two days, have this done in five days'…. Not having any experience, it was the kind of thing that was very helpful early on…."

Scholars also stated that early alignment of expectations can help to avoid a scholar-mentor mismatch and prevent misunderstandings about the relationship of the scholars' work to that of their mentor or others in the same research group.

"I went through a change of mentor and I think for me it was really helpful to upfront see the mismatch…I think communication directly with that mentor as well as with peers and other people, it was really clear…this is not a match, let's find something that works so that we avoid a long-term frustration."

"I'm…seeing one [a mentoring relationship] that went sour. And these are both very bright people, very talented people…. But obviously it had to do with the establishment of goals together. Somehow there were some different expectations…. They were open and honest and critical and they realized they can't work together."

"We're working on this project that has five people on it…. We need to have clear rules about what part of the project I'm going to do…But we honestly have not been clear about it…. So I actually brought it up to our mentor today…"

Another way in which scholars articulated the value of aligning expectations was by pointing out the potential adverse impact of not doing so. As noted by one scholar,

"There ends up being frustration on both sides where you're trying to achieve one goal and somebody else is trying to achieve a different goal…. You're just not on the same page. You're not talking the same language…. You see it in very tangible ways."

Several scholars commented that the process of aligning their expectations with those of their mentor had additional, positive effects on the interpersonal aspects of their relationship (e.g., facilitated mutual trust, professionalism, respect):

"You need to have really, really wide open lines of communication, which also means you need to have a lot of trust in your mentor…."

"If you've got enough communication to be able to tell each other what you expect, then you've got enough trust and… ability to deal with each other in a professional way."

"Being direct and honest and forthright… I think that breeds mutual respect and understanding."

This sentiment was echoed by a former scholar, who had established his own independent research program. He described his own mentoring approach in this way:

"I always ask…: 'Hey, is there anything that you see that I'm doing that I should be doing differently…?' There's been some suggestions, which I've taken and applied…. It empowers the people that you're working with to feel like they can make a change…."

Lastly, scholars indicated that it was important to review and revise the expectations on an ongoing basis, at least once a year and perhaps more frequently.

"I don't think it was in writing, but I think it was on the table from the get go, as well as the fact that we were going to have written, yearly objectives."

"My goals are well in-line for what I think my mentor's goals for me are. It's more the day-to-day or month to month kind of adjustments…."

Mentors also regarded alignment of expectations as important, but for somewhat different reasons than those expressed by scholars. Specifically, mentors saw value in the alignment process as a mechanism for developing the scholars' negotiation skills.

"It's the first place that helps them negotiate…it teaches them. Can you imagine agreeing to do something for four years and not putting anything in writing?

Mentors frequently noted that the alignment process helps to ensure that scholars remain "on track" with respect to their milestones.

"It provides…a starting point, and a place to go back to if things aren't going well, or as a milestone for assessment of how things are going."

"[It] sets up the general expectations. It really outlines what their projects are. Plus, it puts a timeline on it."

"If I don't tell them how we need to move along…it's harder to say that they have to do it."

Aligning expectations can also be useful for keeping mentors themselves "on track." That is, early alignment of expectations

helps keep mentors accountable to the scholars, both in terms of the original commitments they made and their continued contribution to the scholar's ultimate career success. As one mentor noted,

"…My reputation as a mentor is on the line. They're going to be judging my track record…those mechanisms serve as an external reminder for me to be successful."

The alignment process was seen as particularly important by mentors in two scenarios: confirming the responsibilities and commitments of individual mentors on a mentoring team; and ensuring the agreement of division or department chairs with the mentoring plan, especially when the primary mentor is not in the scholar's department.

"If I were to enter into more co-mentoring situations…there would be something written down between me and the other mentor about who is going to be doing what and how things are going to work."

"The chair…has sat on mentorship committee…so that we can make sure that we're actually on the same page and not in conflict. Most of the time, it's over responsibilities or time or expectations."

Programmatic interventions to facilitate identification and alignment of expectations

In the systematic review, we identified 10 publications that evaluated the effects of interventions to improve mentoring.[30–39] Three of these publications examined the effect of training programs for mentors that included explicit efforts to address the expectations of scholars and mentors in the mentoring relationship (*Table 2*).[36–38] In the only controlled study, Pfund et al. examined the effect of a training program in 11 research universities for basic scientists who were responsible for mentoring undergraduate scholars.[36] Compared with a control group of mentors, mentors who volunteered to participate in the training program reported an increase in their skills in establishing expectations for their undergraduate scholars and were more likely to discuss expectations with their scholars. The program did not, however, result in a significant increase in the self-reported skill levels of the scholars, although scholars of trained mentors were more likely to agree with the statement that their mentor "regularly assessed the skills and knowledge that they had gained in the laboratory."

The two other reports describe mentor training programs in single institutions and provide only limited assessments of their impact.[37,38] Blixen et al. instituted a half-day workshop for mentors and assessed the grant productivity among their scholars at two time points, five years apart.[37] They found an institution-wide sixfold increase in the number of mentored career development (K) awards to scholars during this time period. Similarly, Feldman et al. established a program comprising 10 case-based seminars and panel discussion.[38] Their evaluation looked only at the participants' self-assessment of their mentoring skills and ability to assist scholars with understanding the expectations for academic career advancement. Nearly all participating mentors reported improvement in these outcomes.

The survey of 46 CTSA KL2 programs directors indicated that, as of 2009, a majority had formal mechanisms to communicate

Author (Reference)	Year	Setting	Study design	Intervention	Key findings
Pfund (36)	2006	11 research universities	Program evaluation (with control, not randomized)	8 case-based seminars for basic science faculty mentoring undergraduate scholars	Mentor participants self-reported that the program enhanced their skills in establishing expectations
				Group discussion of communicating effectively, establishing expectations, considering diversity, discussing mentoring approaches, and applying a "scientific teaching" approach to mentoring	Mentor participants self-reported they were more likely to discuss expectations with their scholars vs. controls (74% vs. 35%, $p < 0.05$)
					Scholars of trained vs. untrained mentors self-reported no difference in their skills, but scholars of trained mentors were more likely to agree with the statement that their mentor "regularly assessed the skills and knowledge that they had gained in the laboratory"
Blixen (37)	2007	Single academic medical center	Program evaluation (no control)	Half-day workshop for clinical research mentors	Across the institution, the number of K grants obtained by mentors' scholars increased from 4 in 2001 (before the program) to 24 in 2006 (after the program)
				Group discussion of experience and accomplishments in clinical research, availability of time to interact with the scholar, reconciling mentor and scholar needs, expectations of the mentoring relationship, and ability to communicate openly	
				"Code of Mentorship" for mentors and mentees to clarify expectations in the mentoring relationships	
Feldman (38)	2009	Single academic medical center	Program evaluation (no control)	10 case-based seminars for mid- and early senior-clinical and translational research faculty	96% of participants agreed that the program helped them to become a better mentor
				Panel discussion of the mentoring team concept, specifically defining roles and expectations for the lead mentor, co-mentors and career mentors, and the scholar	100% of participants self-reported enhanced skills in helping their scholars understand the expectation for academic advancement and promotion

Table 2. Summary of evidence of the value of identifying and aligning expectations in the mentoring relationship from a systematic review of the literature.

the programmatic expectations for the mentoring relationship to mentors (24/46, 52%) and scholars (25/46, 54%). The types of formal mechanisms included the following (multiple responses allowed): contracts, agreements, or signed letters 14 (30%), orientation meetings 11 (24%); a handbook 5 (11%); a mentoring oversight committee 5 (11%); and, an initial meeting with the program director 1 (2%).

The focus group interviews explored the value of these formal mechanisms, particularly the use of mentoring contracts, agreements, or signed letters. Scholars expressed general support for these tools, indicating that they helped start the conversation about expectations; were useful for suggesting specific topics that should be discussed; enabled them to communicate explicitly about the obligations of their mentor, including the financial support they could expect; and provided a timeline and a guidepost for their periodic evaluations conducted by the program.

"It just makes the goals realistic…. The contract is helpful to…put some tangible small step goals in between my big goals."

"Tools facilitate that conversation, where because of the power dynamics, maybe that conversation is more difficult to bring out…."

However, they also expressed reservations with respect to the potential inflexibility of formal alignment mechanisms (*"A universal, one size fits all, would not fit all"*) and their limited use in holding mentors accountable for meeting expectations, particularly given the substantial influence a mentor can have on a scholar's career.

"It's not necessarily helpful…as far as accountability."

"I think it's so difficult to give somebody feedback when the power differential is so great."

"I can think of multiple occasions when I would have probably liked to have made a minor comment about something that my mentor could improve, and didn't."

"If you say something poorly about them [mentors], they can kill your career—point blank."

For reasons such as these, scholars cautioned against over reliance on these documents as a primary strategy, and suggested that scholars themselves must be responsible and empowered to look after their own interests.

"I think it's necessary but not sufficient…. Papers like this notoriously get filed away. So what about mentee empowerment? So that they [mentees] understand…the essential items within successful relationships, and apply some of those concepts to their own relationship…. Or to see when things aren't working. What are some strategies that the mentee can use…to help their mentor become a better mentor? That would be even more important than any document."

"The mentee has to take personal responsibility…. I don't know that a paper document would be as helpful as empowerment."

Mentors also expressed general support for formal mechanisms to align expectations, noting that they were useful for identifying topics that should be discussed, which otherwise might be overlooked; helped scholars who were reticent to ask for support from their mentor; kept scholars "on track;" reminded mentors of their obligations; and helped mentors negotiate for protected time and support for their scholars, particularly those in other departments.

"It helps to set the framework and pick up on the things you might not specifically think of…. It provides a starting point, and a place to go back to if things aren't going well, or as a milestone for assessment of how things are going."

"It sets up expectations and gets people to buy in. It's not because people have ill intentions, but people forget that they agreed with how they protect this person."

One program director described her formal approach:

"We do the written down thing every year…. I really want to make sure that the people who are on board are doing the work that they need to be doing as mentors. We come up with a yearly plan…present the plan…get feedback…and then meet again the next year…. Each year we revisit with the goals for that year."

However, mentors also expressed the need to balance formal and informal mechanisms according to the needs of individual relationships, and some expressed skepticism of the value of formal tools.

"So to me, it's figuring out the balance between the formal and the informal and then adapting what I do and what I don't do…because things that may work for me and my style…may not work for certain people."

"These kinds of contracts, they're nice ways of bookkeeping, but…let's be honest…people formulate things because they're told…I don't think it improves them."

Types of expectations that are important to identify and align
In *Table 3*, we outline the types of expectations addressed in mentoring contracts and agreements used by 8 CTSA KL2 programs and in the AAMC "Compact Between Postdoctoral Appointees and Their Mentors."[10] The domains addressed include expectations regarding the scholar's research, education, and professional development and career advancement as well as shared expectations of both the scholar and the mentor regarding support, communication, and personal conduct and interpersonal relations.

Many of these domains were also touched on in the focus group interviews. For example, mentors described the importance of identifying milestones, confirming expectations about the scholar's protected time for research, and clarifying the support to be provided by other mentors on the team. Scholars described the importance of defining the frequency and scheduling of meetings to discuss their progress, the amount of protected time they had for research, and the financial support for their research that would be provided by their mentor. However, many scholars also expressed difficulty in knowing what they could realistically expect and ask for from their mentors. As one scholar noted,

"As a junior faculty, you're not quite sure what you're entitled to. You're not exactly sure what the mentor is supposed to provide. So making sure that's defined (actually I think it would have to be tailored to an individual pair), it might be helpful up front."

Both scholars and mentors commented that longer-term expectations regarding the scholar's career development and academic promotion should be articulated. A prominent theme in both the mentor and scholar focus group interviews was the critical importance of identifying and aligning expectations about the scholar's independence, such as: how the ideas and data generated by the scholar would be used; how scholars would receive credit for their work; and, how the scholar's work would be distinguished from that of their mentor and eventually lead to their research independence. For example, scholars shared these comments:

"It is always disturbing when you see your data that you thought had become your own project end up as a major thrust of your mentor's grant."

"My content mentor and I have very similar interests. The problem for me is carving out my niche. What am I going to be doing that she does not do? What am I going take on as my passion in all of this?... How do I differentiate?"

"Sometimes the mentor doesn't recognize when to let go. Some consistency in terms of expectations for independence… would be really helpful."

Mentors shared similar concerns and described the importance of setting expectations with scholars regarding independence:

"Young folks [are] trying to develop [their] career, and they're in your lab, right? So…they're using your data doing things, and yet they want to be independent and publish separately… so you have to come to those sort of arrangements."

"They work in your environment and then they come up with all these bright ideas. Well, is it their ideas or the environment you provided for them? Do you actually own some of that intellectual property? It's one of those things… that probably would be best discussed up front…. It would be nice if it were on a checklist someplace too."

Domain	Description
Research	Knowledge of scholar about current developments in research area
	Technical skills of scholar in research methods and procedures
	Research productivity of scholar (e.g., conference abstracts, publications, grant applications)
	Progress of scholar toward research independence
	Responsible conduct of research by scholar and mentor
Education	Didactic activities (e.g., coursework, seminars, workshops) of scholar to fill gaps in research training
	Other educational activities to facilitate the scholar's professional growth and career advancement
Professional development/ career advancement	Skills development of scholar (critical thinking, creativity, writing, speaking, reviewing, setting priorities, managing time and projects, teaching, mentoring, leading teams, working with others)
	Academic promotion of scholar (understanding and meeting promotion requirements)
	Networking by mentor on scholar's behalf
	Skills development of scholar in the conduct of team science
	Maintaining appropriate work-life balance of scholar
	Supporting of scholar's exploration of different career pathways
	Socializing the scholar to institutional culture (e.g., structures, processes, interpersonal climate)
	Identifying a process for ending the research mentoring relationship while continuing to support the scholar professionally as needed
Support	Allocation of scholar's effort to research vs. nonresearch activities
	Support provided by mentor for scholar's research (e.g., space, equipment, supplies, technician)
	Facilitated access of scholar to experts, training opportunities, key committees
	Opportunities to develop and work on multidisciplinary team projects
	Attendance of mentor at scholar's presentations
	Advocacy on behalf of scholar
	Emotional support of scholar
Communication	Frequency of meetings with mentor, mentorship team, and program leadership
	Topics to be addressed at meetings, information to be prepared in advance of meetings
	Completion of progress reports by scholar and mentor for program director and departmental chair
	Coordinating input from multiple mentors and research team members
	Constructive critique and feedback (offered by mentor; asked for, reflected on, and applied by scholar; followed up on by both mentor and scholar)
	"Ground rules" for communication (e.g., openness, truthfulness, confidentiality)
Personal conduct/ interpersonal relations	Ethical/professional conduct by both scholar and mentor
	Understanding and respect for diversity by both scholar and mentor
	Strategies for managing conflicts in the mentoring relationship
	Appropriate acknowledgement of one another's contributions to shared projects

CTSA, Clinical and Translational Science Award; KL2, mentored clinical/translational research career development program.

[a]Drawn from review of the AAMC' "Compact Between Postdoctoral Appointees and Their Mentors"[10] and mentoring contracts or agreements used by following CTSA KL2 programs (with permission): Columbia University; Mayo Clinic; University of Alabama at Birmingham; University of California at Davis; University of Pittsburgh; University of North Carolina; University of Rochester; Vanderbilt University.

Table 3. Types of expectations included in mentoring contracts and agreements.[a]

Discussion

Examining information from a variety of sources, we found evidence that identifying and aligning expectations in the mentoring relationship is viewed as important by scholars, mentors, KL2 program directors, and experts in the field. The comments of scholars and mentors in the focus group interviews were compelling, both in the positive sense (i.e., aligning expectations enhances the mentoring relationship) and in the negative (i.e., failure to do so may result in a mismatched or dysfunctional relationship).

A majority of KL2 programs explicitly communicate programmatic expectations to scholars and mentors. A minority use mentoring agreements or contracts to facilitate the process of alignment of expectations between scholars and mentors. Viewed collectively, they address a broad range of domains, including the scholar's research and education, professional development and

Measures	Comments
Process measures	
Frequency and results of discussion	Report both from the scholar's and mentor's perspectives
	Identify expectations that were discussed and how issues were resolved
Mentor's skill in facilitating discussion	Report from the scholar's and/or an independent observer's perspective
Scholar's report what is expected of them and what they expect of the mentor	Assess alignment between scholar and mentor
	Distinguish understanding due to direct communication vs. implicit interpretation
Mentor's report what is expected of them and what they expect of the scholar	Assess alignment between scholar and mentor
	Distinguish understanding due to direct communication vs. implicit interpretation
Satisfaction with the relationship	Report both from the scholar's and mentor's perspectives
	Identify the drivers of satisfaction between scholars and mentors
Outcome measures	
Achievement of milestones[a]	Assess scholar's achievements in relation to expectations of scholar and mentor
Achievement of goals[b]	Assess scholar's achievements in relation to expectations of scholar and mentor and achievement of scholar's milestones

[a]Publication of research articles, receipt of research grants, academic promotion, etc. as defined in *Table 1*.
[b]As articulated in a career development plan as defined in *Table 1*.

Table 4. Proposed process and outcome measures for evaluating the alignment of expectations in the mentoring relationship.

career advancement and interactions between with the scholar and mentor with respect to support, communication, and personal conduct and interpersonal relations.

However, evidence of the efficacy of these tools—used either individually or as a part of a general intervention, such as seminars or workshops to build mentoring skills—was sparse and inconclusive. Three studies provided data regarding the effectiveness of their interventions,[36–38] but only one had a control group.[36] In addition, aside from the institution-wide increase in K awards reported by Blixen et al.[37] (a finding that is difficult to attribute to a one-half day workshop), the data were largely composed of self-reports of short term outcomes.

Given the substantial investment of time, effort and resources in training new researchers, our findings suggest it is imperative that we develop and use better process and outcome measures to evaluate the current status of mentoring. To this end, we have proposed several process and outcome measures relevant to the alignment of expectations between scholars and mentors, as outlined in *Table 4*.

Process measures—that is, measures to document the frequency and content of the discussion of expectations between scholars and mentors, what they identify as being expected of themselves and each other, and their satisfaction with the mentoring relationship—are relatively easy to measure and likely to be quite sensitive to change. However, these measures do not evaluate mentoring effectiveness, especially with respect to critical endpoints such as the professional development and career advancement of the scholar.

Outcome measures include the achievement of scholars' near-term professional and career milestones. This measure is likely to be very useful because of its relevance, feasibility and direct linkage with the effectiveness of the mentoring relationship. Traditional long-term outcomes such as publications, grants, and promotion are standardized and highly meaningful, but require a longer measurement timeframe and are likely to be confounded by other variables. Better methods are needed to track the achievement of scholars' milestones electronically.

There is also a pressing need for systematic efforts to study the effectiveness of mentoring interventions, especially interventions to facilitate alignment of expectations between scholars and mentors. These efforts should be performed using robust study designs, such as randomized, controlled trials or high-quality program evaluations using quantitative and qualitative assessment strategies. The CTSA Consortium provides an outstanding forum to conduct these types of studies and a clinical trial of the effectiveness of a mentor training program, which includes a module on aligning expectations, is currently underway (ClinicalTrials.gov number, NCT00100386).

Based on comments of scholars reported in this paper, a scholar training program that enhances their ability to understand their needs as junior investigators, effectively negotiate with power-brokers, and to efficiently manage their mentorship teams is also needed.

In this report, we focused on mentoring relationships intended to train investigators engaged in clinical and translational research, specifically K-type or other career development award recipients, postdoctoral fellows, and PhD candidates. These relationships typically extend over several years and involve scholars and mentors at the same institution. The findings in this report, particularly those that relate to formal mechanisms for aligning expectations, may have less relevance to shorter term training relationships, such those involving residents, medical students and prebaccalaureate scholars, or scholars in international or distance training relationships.[40,41] Nonetheless, the importance of aligning expectations, particularly early in the course of the relationship, and the general types of expectations that should be aligned are likely to apply to these relationships.

In addition, we have focused primarily on events and processes that occur early in the course of the mentoring relationship. While this an especially critical period, it is important to acknowledge that

the expectations that the scholar and mentor have of each other must be revised as their work progresses and should evolve over time as the scholar's skills develop. Indeed, the primary goal of research training programs is to generate independent researchers. Future work should explore how the expectations that scholars and mentors have of each other should evolve to address this challenge.

Finally, while we identified a need for flexibility, we did not explore in detail how the process of aligning expectations should take into account the prior research training and experience of the scholar, the prior mentoring experience of the mentor, the type of training program, the organizational culture, and the age, generation, sex, race/ethnicity/culture, work styles and personalities of the scholar and mentor. Factors such as these can have a significant impact on the overall quality of a mentoring relationship, the mentoring strategies used, and the effectiveness of those strategies.[1,2,15,42] Future work should explore how the alignment process can be designed to allow for sufficient flexibility in individual mentoring relationships, so as to optimize the effectiveness of mentoring in specific contexts.

Conflicts of Interest

The authors have no relevant financial disclosures or other potential conflicts of interest to report.

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