

TOPICAL FEATURE

Common Grantsmanship Hurdles of Early Career Clinician-Scientists and How a Medical Writer Can Help

Matthew R. Sandbulte, PhD / Child Health Research Institute at Children's Hospital & Medical Center and the University of Nebraska Medical Center, Omaha, NE

ABSTRACT

Researchers with medical training and clinical experience bring essential perspectives to academic medicine. Compared with their nonclinician, PhD-trained peers, clinician-scientists typically have less training in grant writing, and their time for this work is even more constrained. Medical writers can help clinician-scientists understand and fulfill the expectations of funding organizations and review panels, and ultimately, help them compete more successfully for funding. Based on the literature and personal experience in this role, I propose 4 grantsmanship hurdles that often confront clinician-scientists: (1) identifying funding opportunities that fit, (2) mastering the unique language and integrated narrative style of a compelling grant proposal, (3) turning ancillary documents from drudgery into assets, and (4) shedding the “bunker mentality.” This article surveys practical strategies by which medical writers can foster time efficiency, mitigate experience gaps, and help clinician-scientists develop persuasive grant proposals effectively tailored to the relevant audience.

Medically-trained faculty at academic medical centers play essential roles in the advancement of biomedical research. Clinician-scientists bring the perspective to recognize knowledge gaps that impede progress in patient care and translation of discoveries to the clinic. Although they are well-positioned to enroll patients and coordinate clinical trials, early career clinician-scientists often receive minimal training in crucial research and grant writing skills and have heavy clinical duties that dominate their time. Although junior faculty can seek didactic research training, it is often more effective and efficient for them to consult a medical writer with expertise in writing and grantsmanship. Some academic institutions employ such consultants under job titles such as grant writer, scientific editor, or medical writer.¹ An individual investigator might engage a freelance writer for similar support. This article discusses several grant writing hurdles facing clinician-scientists and details

tools and strategies by which a medical writer can help them clear the hurdles and gain professional skills.

CLINICIAN-SCIENTISTS

Clinician-scientists are biomedical researchers who have formal training and credentials in a clinical discipline. Although many clinician-scientists are physicians, the category also includes pharmacists, nurses, advanced practice providers, dentists, dietitians, and other medical professionals. Clinician-scientists are sometimes categorized by how much of their professional effort is spent in clinical practice compared with research.² The diverse backgrounds, job descriptions, and goals of clinician-scientists correspond with diverse funding objectives. Those with a primary focus on research usually pursue federal funding along a prototypical path that aims for mentored career development grants (eg, National Institutes of Health [NIH] K awards), then research project grants large enough to support a research laboratory or larger clinical trials (eg, NIH R or U awards).³ Others see themselves as clinicians first and have a complementary research portfolio that can be integrated with their clinical practice.^{2,4,5} Critical funding for these individuals may come from subcontracts on federal grants, industry sponsorship of multisite clinical studies, or small grants from foundations, professional societies, or intramural funds.

Regardless of career trajectory, early career clinician-scientists face 2 particularly difficult headwinds. First, clinicians who assume junior faculty positions often start with limited research mentorship and hands-on research experience.⁵⁻⁷ In the sphere of grant writing, they may be unfamiliar with the structures, norms, and vocabulary that more experienced researchers take for granted. A clinician developing a grant might need guidance on how the review process works so that they can write with the true audience in mind. Second, clinical duties increasingly dominate their time,⁴ so clinicians with thriving research programs often rely on a cast of trusted collaborators and team members working around them. A medical writer with expertise in grant writing who fosters effective communication and

efficiency is an invaluable addition to these teams and can help clinician-scientists capitalize on scarce research time.

GRANTSMANSHIP HURDLES FOR CLINICIAN-SCIENTISTS

Most grant writing challenges common among early career clinician-scientists are also familiar obstacles for their PhD-trained peers, so the advice offered here might help a researcher in either category. However, training gaps and patient care duties for clinician-scientists often accentuate the following hurdles. By helping them clear these hurdles, medical writers can foster both professional achievement and progress in medicine.

Hurdle 1: Identifying Funding Opportunities That Fit

Funding agencies post funding opportunity announcements (FOAs) using a variety of channels, and the window of time between the FOA and submission deadline can be as short as several weeks. Investigators who passively wait for relevant opportunities to present are prone to discovering them too late or not at all. Medical writers can assist by designing a robust search strategy, of the sources below and others, and perhaps even take responsibility for maintaining the search and alerting their clinician-scientist colleague(s) to possible matches.

Federal Funding Agencies

FOAs for federal grants are relatively easy to track because sponsors disseminate them through well-maintained Web resources. The comprehensive database at [Grants.gov](https://www.grants.gov) is populated with links to FOAs from NIH, the Centers for Disease Control and Prevention, other arms of the Department of Health and Human Services (HHS), the Department of Defense, and other agencies with missions extending widely across medicine and beyond. Search filters allow users to focus on chosen agencies, funding categories, dates, and other variables. NIH- and HHS-sponsored opportunities also appear in the dedicated NIH database at [NIH.gov](https://www.nih.gov), which features more agency-specific search and filter functionality; for example, you can filter results by activity code (eg, K08, R01) or by institute. In either of these databases, the *Save Search* function allows the user to set up automated email alerts about relevant FOAs in the future.

Private Funding Agencies

Societies and foundations represent the spectrum of clinical disciplines, medical conditions, and patient advocacy themes, and they issue a vast range of FOAs. Although many of these FOAs are relevant to clinician-scientists, their configuration and dissemination vary widely. Some private grant programs are offered on a regular annual or semian-

nual cycle, but in many cases the timing is unpredictable or a specific FOA happens only once. Because these FOAs are invariably posted on the respective organization's website, clinician-scientists or a medical writer could proactively monitor the websites of relevant organizations for new FOAs. A few such organizations simplify this task by offering an electronic mailing list. However, neither method is very efficient if an investigator needs to monitor multiple organizations, or if a medical writer is assisting multiple investigators at once.

One-Stop Solutions

Clinician-scientists and their grant writing consultants who are interested in diverse funding sources should consider accessing a subscription-based, comprehensive grants database (Table 1). These continually capture new opportunities from thousands of private funding organizations, federal and state government agencies, and international entities. Search filters and periodic email alerts make it possible to track opportunities in any sector that match an investigator's research interests and project parameters (eg, submission deadline, budget size, geographic focus). Investigators or consultants can begin by checking what access they may already have through institutional subscriptions. Individual subscriptions to some of these services are also available.

Table 1. Subscription-Based Grants Databases

Database Name	Web URL	Individual Subscriptions
Funding Institutional	fundinginstitutional.com	
GrantForward	grantforward.com	
GrantScape	thegrantscape.com	✓
GrantSelect	grantselect.com	✓
Pivot-RP	pivot.proquest.com	
SPIN	spin.infoedglobal.com	

Hurdle 2: Mastering the Unique Language and Integrated Narrative Style of a Compelling Grant Proposal

Clinician-scientists tend to be goal driven and action oriented. In the process of developing a research proposal they are generally most comfortable explaining their plan to attain new knowledge and drive clinical innovation. Less intuitive for the grant writing novice are how to craft the multiple application sections in a way that inspires urgency about a stated knowledge gap, curiosity about the scientific hypothesis, and confidence in the applicant's capacity to achieve the objectives. In most successful grants, these pieces all begin to crystallize in the specific aims page and are emphasized in each subsequent section. A medi-

cal writer can help the clinician-scientist ensure that these facets are consistently, concisely, and effectively conveyed throughout the full proposal.

Medical journals have recently published several excellent articles that speak specifically to clinicians about writing effective grant proposals.⁸⁻¹⁶ These are easy resources to share with investigators, and medical writers can mine the articles for new ideas and language that might resonate with investigators who are getting used to this genre. In one article that focuses on how to write an effective specific aims page, Monte et al¹⁰ argue that a grant proposal is equivalent to a business pitch:

We define the goal of grant writing as gaining financial sponsorship for planned work; like sales, a proposal requires marketing, tailoring, and a value proposition... The aims page is the point of sale for planned science and is written with the goal of research sponsorship.

These authors describe their formula for writing a persuasive specific aims proposition in 4 paragraphs from defining a critical need to demonstrating the potential return on investment. Two other articles also dissect the specific aims page, offering similar instruction and borrowing colorful idioms from humanities and mathematics.^{8,14} Certain articles contain rubrics for objective evaluation of a specific aims page that may be valuable tools for a consulting medical writer.^{8,10}

This “make the sale” mindset is beneficial throughout the grant writing process. Reviewers are drawn to a grant proposal if it convinces them that (1) the investigator has delineated an urgent problem, (2) they have an innovative and scientifically credible idea to address the problem, (3) the proposed plans are well designed to test the great idea, and (4) the investigative team and research environment display the capacity to execute the plan. Each of these parts is fulfilled through multiple sections of the application (Figure). A clinician-scientist may feel most engaged and confident in describing the core idea or innovative elements of their plan, whereas certain sections (eg, budget, biographical sketches) may seem like mere boxes to check. However, a medical writer who helps them integrate all 4 major elements improves the probability of an outstanding impact score from the review panel.

For an inexperienced applicant who lacks fluency in the jargon and expectations of grants, the instructions and review criteria found in an FOA are often opaque. A medical writer can help not only by decoding the requirements but by checking the application against the FOA for completeness and fulfillment of the specified review criteria (“responsiveness”). A simple way to help the clinician-scientist stay on track is to create a checklist early in the writing

process and keep it updated as a dashboard while completing the application. The AMWA Member Resource Library features a template for a detailed grant checklist and schedule of milestones.¹⁷

Hurdle 3: Turning Ancillary Documents From Drudgery Into Assets

For some clinician-scientists, the list of required supporting documents is a daunting barrier. Often, an investigator either spends many precious hours producing these from scratch or hurriedly produces subpar documents that likely dampen reviewers’ confidence. A medical writer can help elevate the application by introducing resources that lighten the investigator’s learning curve and boost document quality. Sometimes useful tools are readily available, and we may just need to point the investigator in the right direction. For example, the National Center for Biotechnology Information provides a free online app called SciENCv, which helps investigators build a complete and compliant NIH-style biosketch.¹⁸

Another way to help address this barrier is by encouraging smart use of institutional boilerplate text. Many universities seek to help their investigators with grant applications by maintaining boilerplate that describes facilities, resources, expertise, and administrative structures. Although these resources can be a good building block, beware of 2 possible flaws.

First, watch for text that has grown stale after a couple of years on the shelf, both to eliminate outdated information and to ensure inclusion of newer resources. If the clinician-scientist is unsure about key details, reach out to the relevant core facility or office to ask for a fresh review of the information. A medical writer employed at an academic institution can benefit all affiliated investigators by maintaining a current boilerplate library.

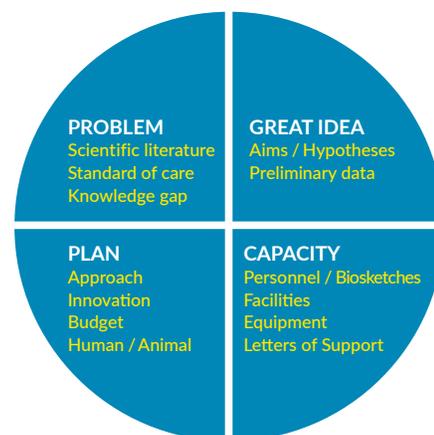


Figure. Four main elements of a grant proposal that the investigator must illustrate for reviewers. Multiple sections of the proposal combine to build confidence in each element.

Second, no matter how complete and current the information is, applicants should not simply copy unmodified generic boilerplate text into an application. Coherence among the many pieces of an application signals to reviewers that the investigator has given careful thought to everything that needs to work together to achieve the research aims. Therefore, resources that have no relevance should be deleted, and the generic text should be enriched with tailored sentences or phrases that emphasize relevance to the project (Table 2).

Table 2. Examples of Tailoring Verbiage to a Specific Proposal

Grant Section	Points of Emphasis	Tailored Sentence Example
Facilities/ Resources	Access, relevance	Dr Smith has an agreement with the Gait Analysis Lab to support monitoring participants' fluidity of motion post-surgery (see letter of support).
Equipment	Location, features, purpose	The PI's division houses a PET/CT scanner (make/model) with respiratory and cardiac gating to reconstruct phase-matched images. It will be used to screen study enrollees for lung cancer recurrence.
Biosketch–personal statement	Commitment, role	As a co-investigator, I will coordinate the key informant interviews in Aim 2, to include securing IRB approval and ensuring protocol-adherent interviews, transcription, and coding.

PI, principal investigator; PET/CT, positron emission tomography/computed tomography

An excellent way to demystify the components of a complete application is to provide examples of proposals that were funded in the past. Ideally, an investigator has mentors who will share recent grants as models. A staff medical writer can facilitate the sharing process by gathering and managing a small library of model proposals from willing faculty. Furthermore, multiple NIH institutes provide online access to lightly redacted copies of grant proposals they have funded.¹⁹ Examples of applications to other funders can be more difficult to find; however, one online resource, Open Grants,²⁰ maintains an open repository of proposals submitted to a variety of public and private sector organizations.

Hurdle 4: Shedding the “Bunker Mentality”

Clinician-scientists are often forced to fit their grant writing into odd pockets of time around their more rigid clinical schedule. Those who have received minimal research mentorship may not fully appreciate the benefits of robust initial review by a colleague before a proposal goes to an anonymous review panel. Consequently, grant writing tends to be a solitary endeavor; this “bunker mentality” can deprive proposals of objective external feedback and editing. Medical writers can help investigators resist this bunker

mentality by encouraging them to seek the following kinds of feedback.

Program officers working in the NIH institutes are known for the constructive advice they offer investigators. They are often helpful in identifying programs and study panels in which a research idea would find its best fit, sharing the upcoming release of new FOAs, explaining the grant review processes, and decoding reviewers' critiques.²¹ In most cases, an NIH FOA lists contact information for the appropriate program officer(s). Alternatively, a great resource for identifying program officers (as well as institutes and review panels) relevant to the clinician-scientist's project idea is the Matchmaker search tool at the Research Portfolio Online Reporting Tools website.²² Although program staff in other agencies or organizations may be less visible, it is worth trying to identify them for similar assistance. An investigator should initiate the conversation about their proposal concept by email, share a draft of the specific aims, and propose setting up a call or virtual meeting for feedback. Many clinician-scientists seem reticent to reach out for this help; a writing consultant can provide critical assistance in facilitating this process and eliciting valuable feedback.

Peers and colleagues are an invaluable source of grant feedback for investigators at any career stage. Fellow researchers can provide insight from various angles, such as: Has the investigator made a persuasive argument for an important knowledge gap that must be filled? Does the proposed approach stand up to technical scrutiny? How well does the proposal address review criteria found in the FOA? Medical writers bring legitimate insight into these questions as well, but peers can take it to an important next level. Sometimes part of our role is to encourage seeking that help from a couple of trusted individuals and plan it into the writing timeline.

Many institutions seek to elevate the presubmission grant review process by organizing internal mock review panels often targeted toward their junior faculty and trainees.^{23,24} Not only does this facilitate feedback from 4 or 5 reviewers at once, but it also introduces the dynamic of a live panel discussion. Data collected at one institution demonstrated the effectiveness of internal review for increasing success of submissions to NIH.²⁴ The greatest challenge in leveraging this resource is proactive planning. An investigator must request review by a mock panel and supply a draft of at least the specific aims page, several weeks before the funding agency's deadline. When such an opportunity exists, medical writers should encourage working far enough ahead to secure this assistance.

Finally, medical writers can play the role of document editor to help maximize a proposal's clarity, completeness, conformity to instructions, and professionalism. This service may range from early partnership in the conceptual stages to copy editing at the final stage. It is important to remember that many early career clinician-scientists are looking for more than a batch of corrections. We can create a true professional development experience if we partner with our clinician-scientist colleagues and help them think through the communication strategy. A 2020 post to the AMWA Blogs cogently described the editing technique of providing "informational support,"²⁵ that is, you "focus on an author's development by explaining why changes are being suggested and offering to answer questions about editing recommendations/comments." A sense of partnership and a supportive tone help ensure investigators will return for assistance with resubmissions and future proposals.

CONCLUSION

Grant seeking is an integral part of the landscape in academic medicine. Clinician-scientists who aim to advance their research programs and find backing for their ideas will continue to need skilled grant writing assistance. Medical writers can add value across the full scope of documents needed in any given proposal. We can also help our clinician-scientist colleagues see the finished product from the vantage point of funding organizations and peer reviewers. This will not only increase the likelihood of a funded proposal, but also cultivate a clinician-scientist's grantsmanship expertise for future applications.

Acknowledgment

I thank Heather C. McNeill, MA, ELS, and Jennifer K. Peterson, PhD, for their constructive reviews of the article.

Author declaration and disclosures: *The author notes no commercial associations that may pose a conflict of interest in relation to this article. The author received partial salary support from NIH funding for the Nebraska Pediatric Clinical Trials Unit (UG1 OD024953). Contents of the article are solely the responsibility of the author and do not necessarily represent the official views of NIH.*

Author contact: matthew.sandbulte@unmc.edu

References

1. What is an academic grant writer/editor? AMWA Blogs. Published 2022. Accessed June 16, 2022. <https://blog.amwa.org/what-is-an-academic-grant-writer-editor>
2. McKinney RE, Jr. The daunting career of the physician-investigator. *Acad Med.* 2017;92(10):1368-1370.
3. Gosain A, Chu DI, Smith JJ, Neuman HB, Goldstein AM, Zuckerbraun BS. Climbing the grants ladder: funding opportunities for surgeons. *Surgery.* 2021;170(3):707-712.

4. Bensken WP, Nath A, Heiss JD, Khan OI. Future directions of training physician-scientists: reimagining and remeasuring the workforce. *Acad Med.* 2019;94(5):659-663.
5. Mistry MS, Williams AE. Read one, write one, get funded: two junior pediatric hospitalists delve into clinical research and grant writing. *Hosp Pediatr.* 2021;11(1):e6-e8.
6. Hall AK, Mills SL, Lund PK. Clinician-investigator training and the need to pilot new approaches to recruiting and retaining this workforce. *Acad Med.* 2017;92(10):1382-1389.
7. Simpson RL, Cornfield DN, Burris JE. Novel prescriptions from medical schools for physician-scientist training and engagement in the twenty-first century. *Acad Med.* 2021;96(4):512-515.
8. Santen RJ, Barrett EJ, Siragy HM, Farhi LS, Fishbein L, Carey RM. The jewel in the crown: specific aims section of investigator-initiated grant proposals. *J Endocr Soc.* 2017;1(9):1194-1202.
9. Sauer RM, Gabbi C. Grantsmanship: What? Who? How? *Eur J Intern Med.* 2018;57:22-24.
10. Monte AA, Libby AM. Introduction to the specific aims page of a grant proposal. *Acad Emerg Med.* 2018;25(9):1042-1047.
11. Gabbi C, Sauer RM. Grantsmanship writing tips: background, hypothesis and aims. *Eur J Intern Med.* 2019;61:25-28.
12. Sauer RM, Gabbi C. Grantsmanship writing tips: significance, innovation and impact. *Eur J Intern Med.* Jul 2019;65:26-28.
13. Gabbi C, Sauer RM. Grantsmanship writing tips: the experimental design. *Eur J Intern Med.* 2019;64:21-23.
14. Goldstein AM, Balaji S, Ghaferi AA, et al. An algorithmic approach to an impactful specific aims page. *Surgery.* 2021;169(4):816-820.
15. Guyer RA, Schwarze ML, Gosain A, Maggard-Gibbons M, Keswani SG, Goldstein AM. Top ten strategies to enhance grant-writing success. *Surgery.* 2021;170(6):1727-1731.
16. Ingraham A, Emamaullee J, Johnston F, Fahrenholtz M, Goldstein AM, Keswani SG. A practical guide to writing a competitive K award application. *Surgery.* 2021;170(5):1411-1417.
17. RNA Editing. Grant checklist example. AMWA. Published 2019. Accessed June 16, 2022. https://www.amwa.org/page/Resource_Library_List#Grants
18. SciENcv: science experts network curriculum vitae. National Library of Medicine's National Center for Biotechnology Information. Accessed June 22, 2022. <https://www.ncbi.nlm.nih.gov/sciencv/>
19. Samples: applications, attachments, and other documents. National Institutes of Health. Updated June 14, 2022. Accessed June 22, 2022. <https://grants.nih.gov/grants/how-to-apply-application-guide/resources/sample-applications.htm>
20. White E. Open Grants: about. OGrants. Accessed June 11, 2022. <https://www.ogrant.org/about.html>
21. Robertson JD, Russell SW, Morrison DC. How to find the appropriate program and grant mechanism for your idea. In: Robertson JD, Russell SW, Morrison DC. The Grant Application Writer's Workbook - National Institutes of Health version. Grant Central; 2019.
22. Research Portfolio Online Reporting Tools (RePORT). National Institutes of Health. Accessed September 7, 2022. <https://report.nih.gov/>
23. Huang X, Dovat S, Mailman RB, Thiboutot DM, Berini D, Parent LJ. Building a system to engage and sustain research careers for physicians. *Acad Med.* 2021;96(4):490-494.
24. Thomas HS, Brodsky MB, Ewen JB, et al. Internal grant review to increase grant funding for junior investigators. *Ann Neurol.* 2017;82(4):497-502.
25. Bailey MB, Benson K, Weber-Main, AM. Applying writing tutors' communication techniques as a medical editor. AMWA Blog. Published September 21, 2020. Accessed June 16, 2022. <https://blog.amwa.org/applying-writing-tutors-communication-techniques-as-a-medical-editor>