

Emerging Subspecialties in Neurology: A Career as a Clinical Trialist in Neurology

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Abstract

The recent therapeutic advances in the field of neurology highlight the importance of ongoing clinical trials. However, while clinical research in neurology has remained relatively stable over the past 10 years, there has been an interval decrease in neuroscience applicants for NIH funding, which has raised concerns about the pipeline and future of clinical research in neurology. Those interested in such a career can begin by identifying a preclinical neuroscience advance that has yet to be translated into clinical trial work or a clinical area of need based on conversations with patients and families. Once such an area of interest is identified, seeking mentors either at one's own local institution or through networking at conferences is important in developing the necessary skills pertaining to clinical trial conduct and design and in gaining access to the relevant professional networks. There is also a myriad of training opportunities, such as the NINDS Clinical Trials Methodology Course, Masters of Science in Clinical Research, and certificate programs that offer formal training. Additional considerations for advancing in this career include exploring the potential for secondary publications using data available from previous clinical trials or serving as a subinvestigator. Challenges in pursuing such a career include the relatively low rate of positive outcomes compared with other fields and consistent salary support throughout one's career. Overall, a career as a clinical trialist in neurology is rewarding because one is able to participate in advancing the field and offer potentially new treatments to their patients.

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Table Training Opportunities for Those Pursuing Careers in Experimental Therapeutics

Training opportunity	Description
Master of Science in Clinical Research	1- to 2-y program, often flexibly scheduled to fit in with clinical work, to learn how to design and conduct clinical research (clinical trials and observational/translational research studies) and successfully compete for funding (e.g., foundation grants, NIH K23, or R01's in clinical research).
Clinical Research Certificate programs	Program duration can vary from 6 to 24 mo. Offers coursework that provides participants with the training to become successful patient-oriented investigators who can bridge molecular medicine and clinical research. Less intensive than a Master of Science program.
NINDS Clinical Trials Methodology Course (CTMC)	Annual program spanning from April to November that involves regular small group sessions and an intensive portion of the course in July. By the end of this course, participants will have prepared a trial protocol and/or grant proposal, with their experience enhanced by the mentorship and structure of this course. netn.umich.edu/training/ctmc
NIH-FDA Fellowship in Clinical Trial Methodology and Regulatory Science	Two-year NIH-FDA fellowship, with the option for extension for an additional year, includes hands-on participation in neurology clinical research conducted at the NIH Clinical Center in Bethesda, MD, and in neurology clinical research regulatory review at the FDA Federal Research Center in Silver Spring, MD. Fellows will participate in activities related to the planning, implementation, conduct, data and safety monitoring, and regulation of trials either conducted or funded by the NINDS and regulated by the FDA. cc.nih.gov/training/gme/programs/clinical_trial_methodology.html
AAN Clinical Research Training Scholarships	Two-year program in patient-oriented research, supporting performance of a research project, strong mentoring, and a well-defined clinical research training program for the recipient at their home institution. aan.com/education-and-research/research/aan-research-program/clinical-research-training-scholarship/
Fellowship in Neurology and Clinical Drug Development, Duke University -UNC-UCB Biosciences Inc.	Two-year fellowship that offers a combination of academic and pharmaceutical industry training to prepare fellows to launch careers in pharmaceutical medicine. On completion of training, fellows will have the knowledge and skills to serve as program physicians involved in academic or pharmaceutical industry neurotherapeutic projects. Fellows will design, initiate, conduct, and analyze research projects as part of their development programs. pharmacy.unc.edu/education/fellowships/ucb-neurology-fellowship/
Experimental Therapeutics Fellowship, University of Rochester Medical Center	Two-year NIH-funded fellowship specifically aimed at developing clinical researchers focused on neurotherapeutics in neurology. Fellows are offered clinical training in the neurologic subspecialty of their choice; training in biostatistics, clinical trial design, bioethics, and grant writing; training in the design and conduct of clinical trials, funded by NIH, foundations, and industry; and mentoring for their own independent research projects. urmc.rochester.edu/neurology/education-training/neurology-fellowships/experimental-therapeutics.aspx

Recent therapeutic advances in neurology highlight the importance of clinical trials to identify therapeutics that mitigate debilitating symptoms or serve as disease-modifying treatments. Interventional clinical trials in neurology have grown over time, from 1,208 in 2008 to 2,278 in 2017, with academic funding showing the most growth.¹ However, despite these novel therapeutics, the rate of positive clinical trials tends to be low in neurology.²

The development of neurologists willing to advance the field is of integral importance. While neurologic clinical research has remained stable over the past decade, the number of neuroscience applicants for NIH funding has decreased, raising concerns about the pipeline and future of clinical research in neurology.³ This article aims to outline some of the steps to pursuing a rewarding career in clinical research while sharing the insights of 2 senior clinicians as examples of ways to pursue such a career. Dr. Jeffrey Saver is currently a Professor and Senior Associate Vice Chair for Clinical Research in the Department of Neurology at the University of California, Los Angeles (UCLA) and has been involved in multiple NIH-funded clinical trials. Dr. Susan Perlman is currently a Professor in the Department of Neurology and Director of the Ataxia and Neurogenetics Clinical Trials Program at UCLA. She has been involved in multiple industry-sponsored clinical

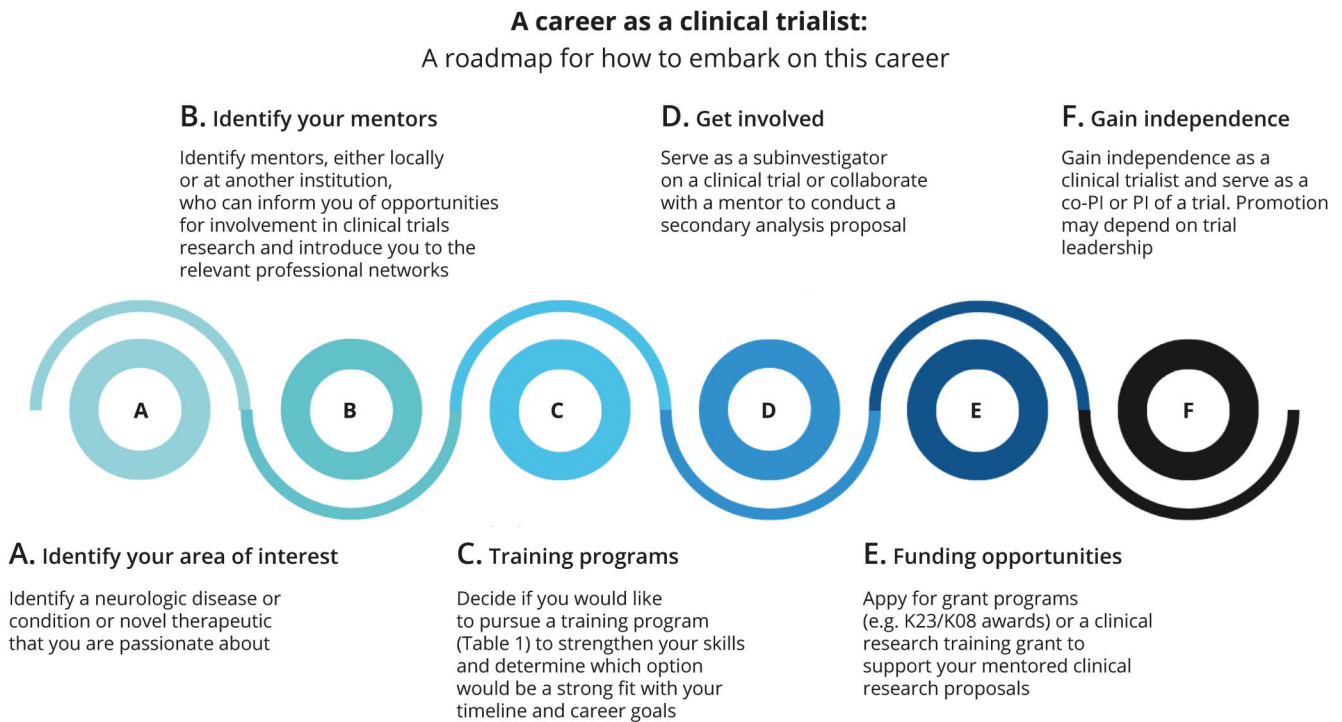
trials investigating therapeutics for Friedrich ataxia, spinocerebellar ataxia, and multiple system atrophy.

Early Career

Those early in their careers may choose to subspecialize by pursuing fellowship training or a similar career training program. This early career period is an excellent time to identify an area of clinical interest relevant to clinical trials research and can be performed by identifying a preclinical neuroscience advance that has yet to be translated into clinical trial work or a clinical area of need based on conversations with patients and families. Finding a therapeutic about which one is passionate is important to sustain motivation because clinical trials typically span for multiple years.

Dr. Saver, for example, completed fellowship training in both behavioral and cognitive neurology and vascular neurology but observed that stroke neurology had a better developed clinical trial enterprise that drew him to this area of research. He began his involvement in his first clinical trials as a stroke fellow, serving as a subinvestigator in one of the early IV tPA trials.

Dr. Perlman's journey began from fellowship work in a laboratory, investigating Friedrich's ataxia (FA), which involved a half-day clinic where she saw research patients with FA.



This figure highlights a series of possible steps that trainees or neurologists early in their career can take to further a career as a clinical trialist in neurology. The figure highlights potential inflection points of this journey. While this figure is not comprehensive regarding potential steps or challenges, its aim is to serve as an initial guide to those interested in this career path. CTSI = Clinical and Translational Science Institute; PI = principal investigator.

Eventually, this clinic became an officially named Ataxia clinic, and she was invited to speak at national ataxia patient conferences, which then led to her participation on the medical research advisory board of the National Ataxia Foundation. Her conversations with patients led her to recognize that to offer her patients therapeutics in the pipeline, she needed to become involved in clinical trial work. She began with one coordinator to help with the clinical trial of idebenone in FA in 2007.

Mentorship

Mentorship is important in the pursuit of a clinical trialist career path because mentors can teach mentees about clinical trial conduct and design, introduce mentees to the relevant professional networks, inform them of appropriate formal training programs and opportunities, and provide them with opportunities to involve themselves in ongoing clinical trials at their institution.

One of Dr. Saver's mentors during training was key in developing his method in thinking about the patient at the physiologic level to facilitate clinical practice decisions that require extending trial group findings to individual patients. By contrast, as an example of seeking mentors outside of one's local institution, Dr. Perlman identified a mentor she met at the Cooperative Ataxia Group meeting in October 2001 and subsequently learned much about clinical trial conduct and design

from him. For trainees with difficulties finding local mentors, there exist mentorship programs through professional societies (e.g., American Neurological Association MentorLink program) and subspecialty organizations (e.g., American Epilepsy Society Fellows program). The medical community increasingly recognizes the use of social media as a novel way of seeking and promoting mentorship.⁴ Other potential contacts include the medical advisory boards of national support organizations, leaders of the Clinical & Translational Science Institute (CTSI) at one's local institution, and experienced clinical trialists in other departments (such as neurosurgery or psychiatry), who may share insights about clinical trials research applicable across disciplines.

Training, Funding, and Key Skills

While learning the necessary skills through active involvement in clinical trials is an option, there are also a number of training opportunities that aim to help train young investigators in developing and designing scientifically rigorous, yet practical clinical trial protocols. Such training opportunities include the NINDS Clinical Trials Methodology Course and Masters of Science in Clinical Research programs. Many fellowships will also offer research tracks or a research year. These programs may strengthen knowledge domains such as randomization, subgroup analyses, and clinical blinding. The Table summarizes some of the available programs.

There are funding opportunities for early career neurologists with an interest in clinical research. The NIH offers grant programs such as K23/K08 awards, which are designed to help young investigators develop mentored clinical research proposals, although the K23 program may not favor funding of multicenter trials. There are professional organizations and disease foundations that offer clinical research training grants, which involve variable amounts of protected time for research projects and salary support.⁵ Examples include the American Academy of Neurology's Clinical Research Training Fellowship and the American Heart Association's Career Development Award.

Skill sets that are unique to a clinical trialist include a strong knowledge of human subject research and research ethics. It is important to present trials in a manner that is open and non-coercive. One will also need to learn to understand the perspectives of different stakeholders, such as the FDA, sponsor (industry, NIH, etc), clinicians, and patients while navigating relationships with other parties, such as the data safety and monitoring committee. Collaboration is key in this realm of work, so understanding who the key team members will be, such as a biostatistician for the initial study design and analysis of data, is also important.

Challenges and Setbacks

Salary support during the early and intermediate career years can be a significant challenge. Reimbursement in a clinical trial environment is often not at an equivalent level of billing for a typical clinical visit. Industry sponsors often compensate for only the time spent on documented responsibilities outlined in the budget, as opposed to offering salary support. The clinical trial budget may provide support for a coordinator, although support for the PI is limited. One way of overcoming this challenge is to increase involvement in clinical trial work over time to eventually sustain one's own salary. Institutional charges for clinical trials can also make it hard to be revenue positive.

Other challenges in the pursuit of this career path include the low rate of successful agent development in neurology.² However, there are hopes for an improved rate of success related to recent improvements in methodological rigor in basic science drug development, improved sophistication in human clinical trial design, and the more efficient use of biomarkers.

How to Ascend in the Clinical Trials Space

Listening to patients and their families, remaining open to what their needs are, and working with patients through patient initiatives may open additional doors for clinical research. Early on, one can also become involved in enrolling patients, managing outcomes assessment visits, or working with a mentor to generate and perform a secondary analysis proposal early on in their career. Other avenues for entry into this career include

serving as a site subinvestigator in multicenter trials and with that entrée going to investigator meetings to see how clinical trials are run and serving on clinical trial implementation or outcome adjudication committees. Government-funded studies may have data that later becomes available in open repositories for analysis. Generating secondary publications will facilitate growth opportunities later on.

Opportunities to serve as a subinvestigator may help build experience and publications. In contrast to government-funded clinical trials, industry-sponsored clinical trials do not typically release their data publicly, but subinvestigators have access to the data as trial contributors.

Promotion to associate to full professor may often depend on leadership in these trials, although if a physician is pursuing a clinician-educator track, participation in a clinical trial is often considered as contributing to the academic and research activities at the institution and looked upon favorably for promotion.

Conclusion

Identifying an area of interest and finding a mentor either locally or by networking at conferences are ways to begin embarking on this career path (Figure). Other options for involvement include serving as a subinvestigator and becoming more involved as a member of steering committees. With government-funded clinical trial open databases and industry trials, exploring ideas for secondary publications may also serve as a strong starting point. Finally, remaining grounded in one's ultimate commitment to patient care and passion for advancing the field of novel therapeutics will assist in building resilience on this career journey.

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Continued

Appendix (continued)

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References

1. Turner BE, Magnani CJ, Frolov A, et al. Neurology trial registrations on ClinicalTrials.gov between 2007 and 2018: a cross-sectional analysis of characteristics, early discontinuation, and results reporting. *J Neurol Sci*. 2021;428:117579.
2. Dimasi JA, Feldman L, Seckler A, Wilson A. Trends in risks associated with new drug development: success rates for investigational drugs. *Clin Pharmacol Ther*. 2010;87(3):272-277.
3. Hall DA, Ramos AR, Gelfand JM, et al. The state of clinical research in neurology. *Neurology*. 2018;90(15):e1347-e1354.
4. McLuckey MN, Gold JA, O'Glasser AY, Hingle S, Spencer A, Fick LB. Harnessing the power of medical twitter for mentorship. *J Grad Med Educ*. 2020;12(5):535.
5. Statland JM, Griggs RC, Augustine EF. *Emerging Subspecialties in Neurology: Fellowship in Experimental Therapeutics of Neurologic Disease*; 2012. Accessed May 3, 2021. urmc.rochester.edu/neurology/training/



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