Research and Scholarship

6

José E. Rodríguez, Kendall M. Campbell,
and Brandon Patterson

Summary

The journey from medical school to full professor is a long but rewarding journey for students and residents. It begins with identifying a mentor and continues through steady progress by asking many questions along the way. Our pathways are highlighted in personal stories below and included joining a network of researchers, where we gained writing and literature searching skills, whereby we transferred to our other scientific papers. Building an aptitude for research doesn't form overnight, but is built up over time by getting involved in the work. Examples of this can include writing letters to the editor, crafting personal narratives, and being invited to help with systematic literature reviews, which then lead to other projects. The authors of this chapter are clinicians and a librarian—two of us graduated from medical school to see and help patients, and we continue to do so. The other graduated from a school of information and education to help students and residents, like yourself, find the information they need to help patients they care about. This chapter will help clinicians find inroads into academia should they choose to do so. Academia is not for everyone, but we cannot imagine a career where our impact on the future could be greater.

J. E. Rodríguez (✉)
Department of Family & Preventive Medicine, University of Utah School of Medicine, Salt Lake City, UT, USA
e-mail: jose.rodriguez@hsc.utah.edu

K. M. Campbell
East Carolina University, Brody School of Medicine, Greenville, NC, USA

B. Patterson
Spencer S. Eccles Health Sciences Library, The University of Utah, Salt Lake City, UT, USA

Personal Story – Kendall M. Campbell

I grew up in the rural panhandle of Florida in a town of about 7,000 people. My mother was a school teacher and my father worked in civil service at an air force base. They taught me as a young black man that I would have to work harder than my non-minority peers and that I would not receive identical benefit or recognition. They taught me that I couldn't always do the same things my peers did and get the same result and that I would have to prove my worth at school. They taught me to always remember that I was a black man and that society may not always welcome my presence. Not only that, they taught me that as I advanced in training the learning environments that I accessed would become less and less diverse increasing feelings of isolation and poor fit. In grade school, I was constantly reminded that I was not an imposter and that I belonged in classes with my non-minority peers.

My parents required that I attend a historically black college for undergraduate school to build comradery, network and inclusion. It was encouraging for me to see professors who looked like me and with whom I could relate. After finishing my undergraduate training, I went on to medical school in a less diverse environment, but one that was supportive because of the offices of minority affairs and counseling. Those offices provided me the support I needed to be successful in medical school and I am grateful for them making me feel like a part of the learning environment.

During medical school my earliest exposure to research was an opportunity that I received from the University of Florida Area Health Education Center. This experience occurred around my first year of medical school. I didn't think of it as a research experience at the time as I got the opportunity to go back to my hometown and lead a smoking cessation project with the local health department. The experience was a rewarding one as I got a chance to work with people in my home community, yet it was a challenging one as I was really early in my training and knew little about research in terms of process and outcomes. Although that was the case, the experience taught me the importance of giving back to those coming behind me and offered me the opportunity to impact the lives of those I shared community with by helping many with smoking cessation. Mentorship was critical to my success as a summer student at the health department. I was mentored by the physician lead who would take me to lunch and share with me about life as a physician. He was a retired otolaryngologist with a very welcoming and easygoing personality. He helped me organize my project, guided me through relationships with those at the health department and really helped me understand the benefits of mentorship in the community setting, even my home community where I knew most people.

My academic career has been a mix of clinical, teaching and administrative responsibilities. I was initially focused on clinical work with research and scholarship not being given much thought. I learned later about the minority tax and that academic medicine was designed that way for minority faculty; that we serve more often in the clinical care role than in the role of scholar or researcher. After learning this, I forced my evolution as a faculty member through seeking mentorship and leadership development. I co-founded and co-directed a research center with Dr. Rodríguez focusing on recruiting and retaining underrepresented minorities in academic medicine. Although I mostly serve in an administrative role now, I continue to research and find scholarship opportunities through directing the Research Group for Underrepresented Minorities in Academic Medicine at the Brody School of Medicine at Eastern Carolina University.

Personal Story – José E. Rodríguez

Both of my parents are Puerto Rican, but I was born in New York. I was raised in a very Puerto Rican home, as my parents tried (like many who left the island for the mainland) to reproduce Puerto Rico with food and experiences for us. My siblings and I were also taught Spanish by our parents, even though we spoke English to each other. My family moved to Miami when I was 14 years old. This experience solidified my Latinx identity, as we were surrounded by Latinx peoples, primarily from Cuba, Nicaragua, Colombia, Mexico, and

Puerto Rico. I attended college at Brigham Young University in Provo, Utah. It was my first experience in what was then a Latinx desert—with all of its negatives (frequent micro-aggressions, false assumptions and expectations, and bad advice) and positives (genuine curiosity about my family and culture, support from exceptional minority student advocates, and a beautiful landscape). I wondered about my Latinx identity, and even took some time off to live and volunteer in Paraguay. When I returned, I worked to graduate with honors. My thesis was entitled, "I'm not white: Opposites in Mainland Puerto Rican Culture." It was fun to write, but it was also a self-serving investigation into my own Puerto Rican identity. This identity exploration continued through medical school at Weill Cornell in New York City. I struggled through every year of medical school, and were it not for the Minority Affairs Office (Drs. Ballard and Wilson-Anstey) I would not have survived. I learned there what patients faced in terms of discrimination and health disparities, and I committed to work with underserved Latinx communities for the rest of my career. I took a residency in the Bronx, at the Residency Program in Social Medicine. When I arrived, it was like coming home. I still remember the comfort I felt, having Latinx teachers, patients and staff (New York Puerto Ricans even). I no longer had to code switch—if the thought was in Spanish, I could express it in Spanish, and vice versa. Everyone understood. It is a comfort that I have also sought to reproduce throughout my career.

My earliest research experience was in data collection in an orthopedic surgeon's office. They were composing a paper on the procedures performed most frequently, and it was my job to find that information in the paper charts. That was during my first year of medical school. When I was done collecting data, they thanked me—but I never heard anything after that. Later in medical school, I worked with a community provider on a no-show prevention project. We surveyed hundreds of patients, and then looked at the data. The data told us patients thought mail reminders would help them keep their appointments. We made a change in how we reminded patients, but again, no manuscript. This was frustrating to me, namely because it was a research elective, and I learned an important lesson—my attendings and supervisors were working on a quality improvement project, whose goal was to improve the no-show rate. There were no goals for sharing this information. I learned that we needed to have the goals for sharing the knowledge at the beginning of the project—not the end.

In my second year of residency, however, things changed dramatically. I began working with a mentor, Dr. Matthew Anderson, who conducted research on HIV in Guatemala. I remember saying to him in the hallway one day, "Matt, let me know about the next time you go to Guatemala, I think I would like to go." Dr. Anderson heard me, and he went to our chair, Dr. Peter Selwyn and arranged for funding for me to accompany him to Guatemala City. I stayed there for three weeks, and we collected data on HIV infections. At the time, we were witnessing the revolution that HAART was in the United States—but those medications were not available in Guatemala. My job was to go through the paper note books, determine which admissions were for HIV or related infections. When I returned, Dr. Anderson asked that I keep the data, and make a chart for the paper, as well as review the paper. I was tasked with submitting the paper as well—I remember getting a floppy disk, and an insured envelope and sending a physical copy to the journal. It was eventually published as "The Emergence of AIDS in Guatemala: Inpatient Experience at the Hospital General San Juan de Dios" in the International Journal of STD/AIDS. After that, I was hooked!

I began my academic career as a full-time family physician. After one month in clinic, I was asked to be the site director for medical student teaching. My experiences teaching students in clinic led me to seek more opportunities to teach. I learned early that teaching was fun—and I wanted students to have a good experience in medical school. I hope I was able to provide that for them. I taught students in small group settings and eventually decided to teach medical students full time. In my passion to teach others, I found my passion for research. I found I could conduct research and publish academic articles with students. In time, I progressed from assistant, to associate, to full professor, and am now at the University of Utah Department of Family and Preventive Medicine. I also serve as the

Associate Vice President for Health Equity, Diversity and Inclusion for the University of Utah Health system.

My research started in care for underserved populations, especially diabetes and obesity treatment. After some changes in location and resources, I switched to doing research on underrepresented minority faculty in academic medicine, which is research that I have continued to pursue at the time of this writing. It was with Dr. Campbell that I was able to articulate my goals and work in this space. The research center that we founded was very helpful to continue this work.

Personal Story – Brandon Patterson

As an academic librarian, I serve as support for research and scholarly goals of learners, including ones like yourself. Academic institutions provide ample resources to help young researchers and librarians like myself are called on to help students with many aspects of the research process including literature searching, data curation, citation management, and scholarly publishing. By working in a health sciences library, I've become familiar with the medical field and provide added knowledge and expertise about the scholarly process to support the research community on campus. I find helping future and current doctors find the information they need quicker and easier helps support their research so they can get back to what they're good at – saving lives. I spent much of my childhood in city libraries checking out books, movies, and music that fed my innate curiosities. With having no family or acquaintances in the medical field, it was through books that I first learned about the body, its functions, and the ways medicine can be used to heal. It was through movies that I engaged in conversations around ability and disability. It was through music that I thought about alternative ways of healing.

As I get older, I continually try to better understand medicine through stories that are different from my own. The book, "When Breath Becomes Air" provided insight into important end-of-life decisions by an Indian-American neuroscientist. "The Immortal Life of Henrietta Lacks" sheds light onto the trust physicians have with their patients and how easily that trust can deteriorate when transparency isn't a priority. And looking beyond books, I can see ways the library is providing stories in new ways using technology. Articles are now available at my fingertips using health sciences databases like PubMed and UpToDate. I can embody a patient through virtual reality in Embodied Labs and begin to better describe what it feels like to have macular degeneration or loss of vision. I am excited about the role the library plays in research and will include insights into this chapter for ways to best utilize resources available for you to succeed.

What Is Research?

Research is multi-faceted, involves a high level of curiosity and is often aligned with passions and values you may already hold as a student, teacher, and community member. Research often aligns with personal and professional interests. We want to share some of our experiences and challenges to conducting research to better help you in your academic journey. Research and scholarship completed during medical school or residency can help build a foundation for a career in academic medicine [1].

What Research Interests You?

There are several types of research that may be more meaningful than others based on your personal and professional interests. For example, you may be more inclined to do biomedical research because of a lab project you had in a science class, while

others may be interested in educational research or community-based participatory research because of their passion to serve a community they are a member of. Others might find themselves attracted to several research types and that's okay too. It is important to reflect on your experiences thus far in academia, where you've found yourself leaning towards in terms of interests, and who you lean on for mentorship.

Consider the following questions when considering the type of research to pursue:

- Is there an area in my field I'm drawn toward? Would a specific research type better complement the field I am interested in working?
- What questions do I have that can get at how medicine works, who the patient population is, or how medicine affects specific populations?
- What types of research have I done and what did I like or dislike? What were some of the successes and challenges in participating in research?
- Who do I know who can help me with my academic career? Or who can I reach out to and find help?

Types of Research

There are several research types you may be drawn to in your medical career. For new clinicians who recently graduated from medical school, you will likely be provided opportunities to take part in the types of research discussed here. They are: basic science, clinical, health services, community-based, and educational research. Typically, new medical school graduates have only been exposed to basic science research in their education. However, the other types can provide a different perspective on what research can offer and we recommend exploring them. Virtually any medical student or resident can find a subject of interest within the categories described below – sometimes it just takes asking how to get involved.

Common Types of Research and Scholarship

- *Basic Science Research*: This is research you might be most familiar with as you've probably done it in science courses. It is also called 'bench research'. It is conducted to increase knowledge and understanding of the physical, chemical, and functional mechanisms of life processes and disease. Basic science research promotes better understanding of fundamentals in science. It involves observing, describing, measuring, and experimental manipulation. It provides the building blocks upon which the other types of research (applied and clinical) are based. A basic science researcher seeks to add to the store of knowledge about how living things work. A basic science researcher's experiments add pieces to the immensely complex puzzles of life [2].
- *Clinical Research*: This research has the most impact on the patient. It takes place in a clinical setting and is focused on treating specific human and/or animal

diseases. Clinical research builds upon the knowledge learned through applied and basic science research. Clinical research is conducted on human beings and takes shape in treatments and drugs that directly improve human healthcare [2].

- *Health Services Research*: A multidisciplinary field that involves pharmacists, nurses, health workers, and other disciplines. It uses scientific investigation to study how social factors, financing systems, organizational structures and processes, health technologies, and personal behaviors affect access to health care, the quality, safety and cost of health care, and ultimately our health and well-being. The research domains it covers are individuals, families, organizations, institutions, communities, and populations [3]. Two areas of health services research that have gained considerable attention are patient safety and quality improvement. Patient safety research produces solutions and interventions for safer care. It translates research findings into improved practices and policies [4]. Quality improvement is the combined effort of everyone in a healthcare system to make changes that will lead to better patient outcomes (health), better system performance (care), and/or better professional development (learning) [5].
- *Community-Based Participatory Research (CBPR)*: CBPR research is a partnership between researchers and community leaders. By having the support of community leaders, the members in that population have shown more support and willingness to participate in research. In this type of research, both researchers and community members contribute to the expertise and development of the research. CBPR affords trainees the opportunity to investigate issues of particular concern for a particular community through surveys or interviews providing direct contact with community members. Further, this type of research provides opportunities to design place-based intervention targeting specific areas of vulnerability within a community (e.g., food deserts). Opportunities in CBPR can help you fulfill your sense of service to your community while preparing you with the fundamental skills to pursue a career in academic medicine [6].
- *Educational Research*: This research includes investigation or research of learner assessment, curriculum development, educational mentorship or advising, educational leadership and administration, and/or teaching activities, impact of educational interventions in patients' outcomes, and workplace-based educational assessments. Educational research also affords an opportunity to work in teams, including multi-institutional teams, whereby individuals with different skill sets can work collaboratively to complete scholarship with potentially greater reach.

Methodologies in Research

Research methodologies can be divided into three types: quantitative, qualitative, and mixed methods. For the most part, medical schools will briefly touch on a few of these, and the individual student will have to study on their own (and ask for resources from the library) to learn more about them. The type of research methodology that will be most familiar to medical students will be quantitative, as that is most frequently used to support clinical decision making.

- *Qualitative Research* describes the type and quality of a subject, while interpreting and attempting to understand an event. By using narrative descriptions (e.g., quotes), the purpose of qualitative research is to give someone a picture of what the researcher is understanding. Examples of data collection include focus groups, interviews, or observation.
- *Quantitative Research* typically uses numbers to test hypotheses and make predictions by using measured amounts, ultimately describing events using tables, figures, and graphs. Examples of numbers can be age, temperature, blood pressure, number of drinks in the past month, etc.
- *Mixed Methods Research* uses both quantitative and qualitative methods to investigate and describe phenomena.

All of these methodologies take patience and practice to get right and take time to complete. Sometimes, when there is no way to quantify an effect (or find data represented), qualitative methods can be used. Frequently, qualitative methods reveal more questions and can be used to inform further research. Qualitative methods are time consuming, and many people are needed to conduct, transcribe, and read the interviews. Interviews then need to be "coded" and common themes need to be identified. Qualitative research is where we got our start, and we have used it to inform more qualitative research.

In qualitative research, data sources can be difficult to obtain. New graduates can create their own data by designing and implementing a study, but many busy clinicians do not have the ability to do so. We prefer to perform quantitative research from existing data sets. We have used data from the Association of American Medical Colleges (AAMC), state or federal data, and other sources to try to understand what is happening to racial and ethnic diversity in academic medicine.

What Are the Steps to Succeed?

The clinician authors of this chapter have seen success and failures in research projects. An example of an early experience in our careers is included here to illustrate that the path to success is not always straight forward. Earlier in our careers, we had a student that was interested in hypertension in the Black or African American population of the United States. We performed a literature search, and then designed an intervention using home blood pressure monitors. We incentivized patients to participate in the study: All participants would get a new home blood pressure monitor upon completion of the study. The project received moderate funding, and we began the experiment. Our hypothesis was that patients who had a home blood pressure monitor would record their blood pressure more often than patients who did not have one. The study lasted 6 months, and we had a control group and an intervention group.

In the end, attrition from the experimental groups was so great that we were unable to make any conclusions about the home blood pressure monitor, nor could

we publish any data from the intervention arm of the experiment. However, because there was a large amount of demographic data that was recorded on the intake sheets, we were able to publish a different paper based on the cardiovascular health practices of black patients in an urban underserved clinic [7]. The following steps can help you avoid pitfalls in ensuring your success in research.

Step one: Analyze your personal and professional interests Begin by writing down what interests you currently have and where you see yourself in 5 years. Reflect on where you have been and where you are going. Also consider possible hurdles you have faced and what you definitely don't want to do as a scholar. What stands out in terms of topics? Are you finding a theme? From this, you might be able to write a research question that can be investigated and refined as you continue to get further in the process.

Step two: Have a clear understanding of the purpose and goals of the research project After writing a research question and reflecting on your personal and professional interests, you might find a research project or have one in mind. Upon investigating research opportunities further, ask questions so that you understand the purpose and goals of a research project. If they are not clear, see step 4.

Step three: Is there alignment between your interests and the nature of the research project? This is the decision-making moment. Do your interests align with the goals of the research project? If so, think of ways you can get involved with the research and propose possible ways to contribute. If not, look at other options that may fit your interests or goals more closely.

Step four: Seek mentors Medical school is a time when you are surrounded by excellent researchers and mentors. The first step is to identify a mentor to help you with your career goals. As academicians, we chose medical school education as a career because we want to be mentors. Early identification of a mentor is important and necessary for your success. Do not try to start an academic career alone. If you don't already have a mentor, try looking for one in your medical school or residency program. You can also browse school websites, Twitter or other online avenues to find someone. You can also look at what that scholar has been writing through a quick search of their name on PubMed or Google Scholar.

Step five: Search for potential financial support if applicable (such as scholarships and grants) Many existing research projects already have faculty and funding attached. If not, there is funding available for projects proposed by students or residents. Often times, a university research office would have resources to look through. You might also consider opportunities through the AAMC such as the Medicine in the Community Grant Program or Medical Student Scholarship.

There are also opportunities through community-specific or region-specific organizations like the Latino Medical Student Association or the Student National Medical Association.

Step six: Be clear about the desired outcomes within a time period   Know that research takes time–even a whole academic career can be built around one research question–so try not to overwhelm yourself with a single project. It would be worth it to decide which area of the research you're interested in and focus on that. This can also be a great opportunity to learn or build upon skills you can apply as a future academic physician.

What Are the Basic Skills Needed to Succeed?

There are several skills you'll continually develop as a scholar in the field of medicine. These skills aren't learned overnight but rather something to be practiced, honed and refined. Researching involves putting yourself out there and being willing to fail. It is worth reaching out to others, whether it be friends, colleagues, classmates, or use social media to find out who else is conducting similar research and ask for advice. It is also worth sharing your own accomplishments and discoveries in person or over social media as well as maintain a professional page so you can begin to build a network of supporters and a professional identity. We list a few skills we'd recommend building below for ways you can develop and implement a research project as well as disseminate your findings.

Literature Searching   One of the basic skills you can learn as a practicing researcher is how to sort through information and find relevant and current evidence that may strengthen an argument you are wanting to make. Depending on the resources available at your institution, you may have access to a plethora of databases indexed by medical professionals that lead you to legitimate sources of information. PubMed, a database of articles indexed by the National Library of Medicine, is a great way to start exploring terms and topics in which you might be interested. Looking at Medical Subject Heading, or MeSH terms, is a great way to get a sense of the literature in areas of medicine and what research is currently being done in the field. Your mentor may be able to assist you in finding keywords or MeSH terms to use in a search. A medical librarian can also assist in this process and in addition, can help you conduct literature searches, manage your citations, and help walk you through other information resources provided by your institution.

Generate Hypotheses and Formulate Study Questions   After a quick review of the literature, your mentor will guide you through formulating a study question and hypothesis. They might even have one in mind that you can work from to develop your own.

Study Design and IRB Submission Consider the methodologies mentioned earlier in this chapter and discuss the possibilities with your mentor. This can often be one of the most challenging portions of research and you may have to take additional training or classes to gain more skills in this area. Know that you must describe your study in full detail and learn the rules first – especially if wanting to include human participants, which does require approval through your institutional review board (IRB).

Recruitment and Data Collection In this step, you'll be recruiting participants (if necessary), building a team, creating surveys, developing pre- and post-tests, and collecting feedback. This process is usually time consuming and takes careful preparation. Consider a data collection software that may assist you in this stage of the research process.

Empirical Analysis For quantitative data, it is required to know statistics software like SPSS, STATA, or Excel. For qualitative data, it may be worth exploring NVivo or other software. If unfamiliar with statistics software consider finding a statistician as part of the research team. We've had success in going back over previously collected data with a statistician to come up with additional published works.

Interpretation and Writing Your mentor can help guide you through the interpretation of data and provide some venues (or journals) to present the research to colleagues, patients or the general public. It may be worth investigating where your mentor has published and possible avenues for publication before getting too far along in the writing process. As first-time authors, we've had success writing literature reviews, personal narratives, and letters to journal editors as first-time writing opportunities. It may be worth doing this as part of the research process – just be sure to draft a timeline for yourself so you can finish projects and ultimately publish.

Poster and Oral Presentation An important thing to remember about the research process is that it's all about sharing what you've found with others. Your findings may have the power to change care for patients, influence policy makers, or teach a lay audience about a new topic. You can often get there by delivering your findings at a conference either through a poster or an oral presentation. This is a way many medical students first gain exposure to the academic world and can gain great contacts that will last throughout your academic career. Have a conversation with your mentor about possible conferences to present at and any advice they would have during the proposal process.

Manuscript Preparation and Submission This should be the final step in a research project and may extend past medical school or residency on some projects. Consider writing a letter of interest to the editor of a journal in which you would like to be published. Lean on a mentor to help you in this process and know that it's okay if your journal submission is rejected. Many of our first works got

rejected, but the process improved our writing and produced better scholarship. If rejected, read the reviewers' comments and carefully consider which changes to make. If a journal took time to respond, appreciate their suggestions and don't get discouraged. Immediately consider alternate journals, make changes and re-submit as soon as you can. The worst mistake you can make is to not re-submit your manuscript. You can do this!

Next Steps

Research and producing scholarly output is ongoing and rewarding. We've built great connections with other faculty over the years who respect our scholarship and we see the impact the research we've done has had in our respective fields. We could not have made it to where we are now without our mentors. Mentors assisted in literature searching, research project support, and writing skills that we've transferred to our other scholarly work. We hope the steps and skills provided in this chapter can help you in your own scholarly endeavors.

Research is not for everyone, though when offered a faculty position, you can decide which track you want to take and whether you do more or less research in your role. We, as doctors, consider ourselves clinicians first, and we graduated medical school to see patients, and continue to do so. But we feel the research and teaching we do is a seminal part of who we are and makes us better clinicians. When deciding how much research you want to do as faculty, consider that each institution has their own tracks and you can decide which one suits you best. Tracks differ depending on institution, but typically are referred to as a clinician-researcher, clinician-educator, or professional practice. All tracks offer research participation, but the clinician-researcher affords the greatest allotment of time toward research, usually making up more than half of your time and requires the greatest amount of research productivity. If choosing to take the clinician-researcher track, it may be worth negotiating with your first employer financial support to help grow your research. We wish you great success and continued endurance during these formative years of your life!

To further prepare you for scenarios in the field of research, we've included sample cases adapted from a presentation entitled "Introducing Trainees to Medical Education Activities and Opportunities for Educational Scholarship" on *MedEdPortal* [8].

Sample Cases

Case 1

Michelle is a first year medical student and she is planning for her summer. She previously worked in a lab and on a clinical drug trial in college. She has developed a working relationship with a gynecologist, Dr. Pérez, and is interested in conducting research work related to HIV and women of underserved groups. After

reflecting on her experiences and discussing possibilities with her mentor, Michelle has decided on choosing between two research opportunities:

- Option one: To work with Dr. Pérez on an existing project that utilizes a quantitative dataset to explore health care beliefs of pregnant Latina women.
- Option two: To create an innovative project of her own, where she could plan the research steps from beginning to end tailored to her career goals.

Now consider the following Pros and Cons for each of the options listed above.

- Option one: Pros
  – She has prior experience with lab work and a drug trial but has not had behavioral research experience.
  – She is interested in Ob-Gyn related research on women of underserved groups.
  – The project has already been started and therefore the student may be able to achieve an abstract or manuscript in a short period of time.
- Options one: Cons
  – The study group may already have all of the key players needed and she may have a difficult time advocating to serve as a co-author on future presentations or publications.
  – She was not a part of the process of developing the question, submitting the IRB or collecting the data; important skills to eventually develop your own project.
- Option two: Pros
  – She can plan an Ob-Gyn research project related to HIV and women of underserved groups.
  – She will help develop the project right from the beginning, providing her with the training to formulate a research question and determine the best research methodology.
  – In creating her own study she is well positioned to be first author on a presentation or manuscript.
- Option two: Cons
  – She will need to identify research mentor(s) and statisticians willing to help her in developing, implementing, and writing up her project.
  – The development, implementation, and write-up of findings will take much more dedicated time than if the data was already collected.
  – She will have to identify resources to support the project.

If you were Michelle, which option would you select and why?
Discussion:

If you chose option one:
- *In this scenario, Michelle was able to publish findings on the community she's interested in, pregnant Latina women. To prepare her for research, she gained fundamental skills in data analysis and writing up main findings. These are important skills for an academic clinician to achieve before beginning an*

independent career. She was also able to complete an abstract that was accepted for an oral presentation, which is seen as a valuable form of scholarship.

If you chose option two:
- *Michelle's research experience spanned over a longer period of time but she was able to build skills related to designing and implementing the study. She wrote up her research project and was able to present her findings at a well-respected institution, the Centers for Disease Control and Prevention.*

Each of the options carry weight as steps in creating a portfolio as a researcher. These options may work better for some individuals. It's important to come up with a good timeline of what you want to achieve and tailor opportunities to your own professional and personal interests and goals.

Case 2

Edgar has finished medical school and is advancing into residency. He has had moderate presentation and publication success in medical school and has matched in Internal Medicine. He is interested in research and wants to build a research identity in heart disease within communities of color. He has met with a mentor and has expanded his network of colleagues in this research area and is considering next steps.
- What advice would you give Edgar?
- Where would you recommend he turn to for continued support in developing his research identity?
- What opportunities should he discuss with this person?

    Discussion: It would be wise for Edgar to discuss opportunities with his previous research collaborators, mentors and reach out to possible future collaborators, especially if he moves to a new institution. From there, he could further research projects already invested in. He could serve as a co-author on a poster or oral presentation or co-author on a manuscript or future grant application. Edgar should also inquire about funding supplements for junior investigators so that he could develop his own project.

References

1. Jeffe DB, Yan Y, Andriole DA. Do research activities during college, medical school, and residency mediate racial/ethnic disparities in full-time faculty appointments at U.S. Medical schools? Acad Med. 2012;87(11):1582–93.
2. Biomedical Research Definitions, NJ Association for Biomedical Research. http://statesfor-biomed.org/education/background-on-biomedical-research/biomedical-research-definitions/. Accessed on August 10, 2017.

3. Lohr KN, Steinwachs DM. Health services research: an evolving definition of the field. Health Serv Res. 2002;37(1):7–9.
4. Patient Service Research: A Guide for Developing Training Programs. World Health Organization. 2012. http://apps.who.int/iris/bitstream/10665/75359/1/9789241503440_eng.pdf. Accessed on January 22, 2017.
5. Batalden PB, Davidoff F. What is "quality improvement" and how can it transform healthcare? Qual Saf Health Care. 2007;16(1):2–3. https://doi.org/10.1136/qshc.2006.022046.
6. Sánchez JP, Peters L, Lee-Rey E, Strelnick H, Garrison G, Zhang K, Spencer D, Ortega G, Yehia B, Berlin A, Castillo-Page L. Racial and ethnic minority medical students' perceptions of academic medicine careers. Acad Med. 2013;88(9):1299–307.
7. Campbell KM, Rodríguez JE. Cardiovascular health practices among black patients in an urban underserved clinic. J Natl Med Assoc. 2016;108(1):40–4.
8. Paredes Molina CS, Spencer DJ, Morcuende M, Soto-Greene M, Culbreath K, Corsino L, Sánchez JP. An introduction to research work, scholarship, and paving a way to a career in academic medicine. MedEdPORTAL. 2018;14:10686. https://doi.org/10.15766/mep_2374-8265.10686.

José E. Rodríguez, MD, FAAFP Associate Vice President, Health Equity, Diversity & Inclusion, University of Utah Health Sciences Campus, Professor, Department of Family & Preventive Medicine and Associate Medical Director, Redwood Health Center

Kendall M. Campbell, MD, FAAFP Senior Associate Dean for Academic Affairs and Director of the Research Group for Underrepresented Minorities in Academic Medicine at the Brody School of Medicine at East Carolina University

Brandon Patterson, MSI, MA Technology Engagement Librarian, Eccles Health Sciences Library at the University of Utah