

Core Focus



Biostatistics, Epidemiology, & Research Design Core



Who Should Read This Article and Why: Current and potential investigators will learn about how the BERD Core can help them with a variety of services including research design in the process of applying for Pilot Program grants. Other CTR core members will learn how the BERD Core works with investigators and other NNE-CTR cores to foster great research and to make the whole process easier and more fulfilling.

Welcome to our ongoing Core Focus series where we chat with the NNE-CTR's cores about how they work with investigators and with each other to create strong projects that result in solid research. This issue features the Biostatistics, Epidemiology, and Research Design (or BERD) Core. This core is composed of 11 individuals, four in Vermont and seven in Maine, with a variety of skills from biostatistics to research navigation, or the process of helping investigators through the research process. Here, [team](#) members explain how they work with investigators.

Q: The BERD Core is more than just compiling data at the end of a project, isn't it? What do you do for researchers that they might not know about?

Peter Callas, University of Vermont Core Co-Lead: I think the perception is often that what we do is [just] data analysis. And the reality is biostatistics, epidemiology, and research design really covers the whole gamut. We help investigators come up with a testable hypothesis [and] design the study, especially the analytic part and the



Peter Callas, Ph.D. of the University of Vermont is the BERD Core Co-Lead

sample size, which is what they expect from us. But we can [also] help with all sorts of aspects of it. Once the study is being conducted, there's sometimes quality control we can help with by looking at the data to look for missing values or inconsistencies. Then the analysis and interpreting the findings.

Matt Williams, Cloud Engineer, MaineHealth: We're just now getting into the cloud and my role supports the researchers in providing them with more powerful and agile capabilities to do their work. It's something that we've been working on for a while now and I'm excited now that we have the infrastructure to keep going forward with it. So, we can do things like genomic sequencing in the cloud and that type of more compute-heavy research.

As time has moved on, we're getting researchers who are more familiar with machine learning and AI. We've had requests for researchers to do things like build a machine learning model to reduce sepsis rates in the ER. And then additionally, the other component that's pretty exciting and we've been working for towards is the collaboration piece with other research institutes.

It's much easier and you can share data much quicker and much more efficiently in the cloud with other research institutes with common data models. And if they are working with a different analytic platform, it's not as big of a

deal because the way that we are able to store the data is agnostic for the type of technology that you might use. So being able to have that capability is something that we're very excited about.



Melissa Graham, RN, from MaineHealth's Center for Clinical and Translational Science, is a research navigator and regulatory spe-

Melissa Graham, Research Navigator & Regulatory Specialist, MaineHealth: I am the IRB liaison. My role is really to help investigators who are writing their research protocols and assisting them with logistical aspects, but also with the regulatory focus.

Susan Santangelo, Core Lead, MaineHealth:
We're here to help people do their best research.

Wendy Craig, MaineHealth: I think that says it all, and we are a really good team. We all work together very, very well. We all recognize and respect everyone's different niches and expertise, and we leverage that as best we can to help people.

Q: What's enjoyable to you on a personal level about your job in the BERD Core?

Wendy: I think pretty much part of my everyday work as a navigator is mentoring. It's something we all do, just a part of who

we are.

Deanna: I agree with Wendy. I feel like as navigators, mentorship is kind of like the gift wrapping that we provide that is wrapped around all of the support we provide because we're always kind of teaching and consulting and kind of showing folks best practices.

Jonathan Emery, Biostatistician & Research Navigator, UVM: The big thing for me is the researchers will have a question they're trying to answer. They have data and [they're] trying to align the question to the data. In reality, is this question actually within the scope of what the data can answer? And how much can I clean this data and get it aligned with their question?

Q: That must lead to some interesting conversations with researchers.

Shamima Kahn, Biostatistician & Research Navigator, UVM: When I work with researchers, I do suggest alternative ways of looking at the data or maybe follow-up studies. That's something I feel is a value added. I mean, instead of just taking the data and crunching it, I offer my suggestions, and I don't expect them all to be accepted, but I just want them to be heard.

Peter: That's a good point because we have some areas of expertise beyond just data analysis just based on projects we've worked on in the past. [For instance], Derek, with a master's in computer science, has some other skills that he brings in that the rest of us might not.

Q: When you're working with a researcher's results, do you think about the story they tell?

Wendy: I help with the analysis, but I typically also help with dissemination, whether it's a manuscript and abstract or presentation. And it's always, always, always about the story and it makes it more fun for people to



Susan Santangelo, ScD, of MaineHealth is the BERD Core Lead

realize that. You know, often they want to talk about everything. Well, no. Let's see what the storyline is. It's not that you're being nontransparent by leaving things out; there's only so many tables you can present, right? What are the most important things to them that they want to tell the world?

Jonathan: I do agree that that it can be thought of like a story.

Peter: Clearly when people do projects, they have a hypothesis in mind or they wouldn't be doing it, but we try and help make sure that it's objective. Like yes, you can say that. No, you can't say that. You know, sometimes we have to pull in a little bit [when it's] really not an appropriate interpretation.



Jonathan Emery, MS, of the University of Vermont is a biostatistician and research navigator

Susan: I would just add to that that there are some times when you need to reign in some of the data interpretation. That happens because sometimes people want to say things that really may not be fully supported by the data and you need to make sure that that doesn't happen too, right? So, there's a story, but you don't want the story to be overly embellished or not supported.

Shamima: Yeah, I like the saying, "Numbers don't lie, but they're made to."

Jonathan: It's tough. You can go too far with it sometimes. You don't want to just make the story be an anecdote. We're trying to answer a general question, but, yeah, trying to still keep it a story that you can learn from [is valuable]. It's a bit of a line there.

Shamima: Another thing I would like to add here is [the importance of] putting statistical analysis in plain English language so that everybody can understand. I make it clear that my job is not just to analyze the data, but make sure it is in line with, of course, what the research question is, [and] also what is the existing literature showing right now and how does our study either agree or disagree? It can go both ways, so that's kind of a big part to make sure that the statistical analysis is properly explained and put into the context of the existing literature.

Derek Devine, Biostatistician, UVM: The thing that I see as a potential and a plus about [computer programs such as] R and Python is that there are newer plots that are being used in a lot of papers and publications, for instance, not just a box plot but a violin plot that shows density. That's where you can add creativity and points within a plot that also has a shape to it so there is more than one point of reference. I can see a lot of potential for more information being communicated.



Shamima Khan, Ph.D. of the University of Vermont is a biostatistician and research navigator

Q: Your work spans all kinds of projects. How does that feel?

Shamima: I do enjoy the work in terms of the diverse projects and for me it's like having an opportunity to kind of work with direct patient-oriented research, which I couldn't do myself because I'm not a clinician, I'm just a researcher, so that's kind of enjoyable for me.

Derek: I've worked with Meredith Niles (Ph.D., associate professor in the Department of Nutrition and Food Sciences at the University of Vermont) on some hunger-related things. And it's got me interested in studying those



Derek Devine, MS, of the University of Vermont is a biostatistician

ideas in different ways that aren't really being done here. For instance, using social media to try to [examine] hunger rates in general and things like that. So yeah, I like the exposure to different things, like working on COVID or air quality and wood stoves, cancer studies. I enjoy the diversity because I don't know if homing in on one specific area would I keep it as novel and fun.

Peter: Career-wise, the best thing to do is to carve out your niche in one specific area and be the expert in that. [But] I find I much prefer working on a variety of topics and helping other people get their research done. I enjoy the different topics that come along and learning about them myself. So, some mornings I might feel like I have whiplash going from one study to another because they're on such different topics, but I can adjust. So, for me it's a positive.

Wendy: On the team we have people with a wide array of expertise and different niches so if there's things that we don't understand [we can] bring someone in to help us with it. Also, many of us have been here for quite a few years so we've seen a quite a lot of these things come through in their different forms.

Q: It seems there's a customer-service aspect to what you do, or perhaps it's that you have customer relationships to manage.

Peter: Yeah, it comes up sometimes, both in the analysis, but also in the interpretation and reading a manuscript. And you know, sometimes you make suggestions and then you get the next draft, and they didn't take the suggestions and that's fine; they weren't that big of a deal. But other times they're like, "No," [and] you have to be more forceful, like, "Well, no, that's actually an incorrect interpretation, and it really needs to be changed." So, it's a balance; some suggestions are minor and take and leave it, but others are important things where you have to make a stand a little bit more forcefully. In a nice way.

Shamima: Diplomacy comes in.

Wendy: You have to really be careful and respectful in your dealings with people, but sometimes their ideas are too big and too feasible to do all at once, and their experience isn't there. So, you have to help them shape a project that is right-sized and feasible and with a high probability of success that they can build upon. You never shut an idea down. You just sometimes give them an alternative path of getting there.

Susan: Many times their scope is much too large, and you have to help them bring it down to a feasible size. Without squashing their dreams, right?

Wendy: For the most part, people are incredibly receptive, and particularly the younger or less experienced investigators who have this massive idea, "Ohh, I'm going to cure XYZ and I want to go straight and do this randomized control trial." I find I spend a lot of my time putting the brakes on and convincing people that really, they want to take this as a logical stepwise progression, building knowledge and expertise as they go and cut things up into manageable chunks so that their project will be



Wendy Craig, Ph. D., from MaineHealth's Center for Clinical and Translational Science, is a research navigator

feasible, successful. And they'll have more fun with it, you know? And it's particularly important when you're working with the trainee who's got a limited time frame in which to work on their project. They usually quite relieved to learn that there's a lower hanging fruit that they can start with. It's less overwhelming.

Matt: Yeah, I agree with Wendy on that. I had a student researcher who is currently trying to build a small app that guides surgeons through picking out the right device for cardiovascular stints. He doesn't have a lot of experience but was very receptive in learning about tabular data sets, how you would get that set up. He's currently working with the manufacturers to get all that data compiled and then we'll be able to put that in our data warehouse. And then from there you can go on to building the tool that he wants to use for our surgeons at [Maine Medical Center] so they can quickly pick out what they need for that patient.



Matt Williams, BS, of MaineHealth is a cloud engineer

And when you take the time to show [researchers] what is possible with technology, they get very excited about it. It's something that I enjoy doing and I think researchers are pretty apt to think outside the box and be receptive to new technologies and new ways of doing things.

Q: What projects or type of work do you especially enjoy?

Jonathan: I've really enjoyed working with Planned Parenthood of Northern New England. They've had some a couple of really interesting questions that they need help answering. Most recently, they did a study where, when you test positive for an STI, you're supposed to get retested and historically, those retest rates are pretty bad. So, they're just, they're trying to up those rates. And one of the ideas was mail-in test kits. And so the question is like did this work? That project's been really fun to work on.

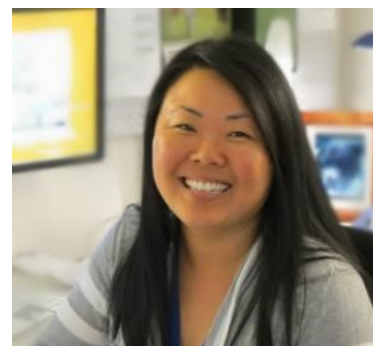
Peter: One thing I've really enjoyed is working with on the pilot projects and really both sides of it--the helping when people come with questions or help in trying to make it be a competitive application and then the other side of it, which is actually reviewing the projects and trying to weigh the strengths and weaknesses.

Derek: For me, just working on a COVID project with [David Kaminsky] has been one of the most fulfilling things and fun things. Just being able to add to the literature out there about COVID and long-term effects having to do with shortness of breath and whether or not there's other things associated like neurological [issues], I think it's just exciting and I think he's going to have a really good paper. I just feel privileged to be able to help him.

Deanna: I fell in love with data in design and so I started doing that kind of work, helping people transform data and best practices with data collection and things like that. I love it because you're always learning new things. You're meeting new people. It's just it's a really rewarding position

Q: What's your advice for people who want to put together a great Pilot Project proposal? When should they be in touch with you?

Peter Callas: The sooner the better. I think we all have stories about, well, mine



Deanna Williams, BA, of MaineHealth's Institute for Research, is a research naviga-

from this week was an email Monday afternoon for something that somebody needed Thursday. And that's why it's nice to be involved early in the project, like in the design phase rather than the, you know, "Here's the data, what can you do with it?" phase. Working with the pilot project applications is great and is a really strong function of BERD. That's what we're here for.

Some things we get involved in when they're just in the conceptual phase and or are vague. And then as you get closer to the letter of intent or the actual application, we get more specific with the details. But it's always nice to have some time to think about things so, at least a month ahead of time can be helpful. I always try to point out that the shorter the time frame, the more likely that errors will crop up because we don't have time to think it through.

Derek: I would second what Peter was saying about as soon as possible, because [if a researcher waits too long] it increases the chance of an error being introduced.

Q: What do you like about your job?

Matt: I've been doing data engineering and cloud engineering since 2014. I was a consultant before I came to Maine Health Institute for Research. Susan told me about her goals for the future state of our technological infrastructure. And I've found that fascinating. It's not as much fun programming machine learning models for, you know, drywall at Georgia Pacific or cargo. I'd rather support research that goes to help people and benefits their health.

Wendy: There's always something new and fun to learn about and it's not a burden; it's a privilege, really, to work with a big variety of subject areas. It's all about the person. It's all about the investigator and lifting them up, guiding them, helping them. It's wonderful to watch how people come along.

Susan: Yes, it's very stimulating. We do get a lot back. It's not that we're just giving; we're getting, too.

Deanna: Being able to consult and mentor and show someone best practices, for instance with data and then also have them teach me about some of their best practices in terms of their expertise, it really is a full-circle thing for me. And so I feel like I get as much as I give, and it's a really it's just a really fulfilling role.



Emmaline Ashe, MPH, of MaineHealth's Institute for Research, is a research navigator

Emmaline: Within this core there is that culture as well. [For example], Deanna and I have a lot of overlap in the work that we do and she has been so great in teaching me things and helping me, and I would say that about all of the navigators. That culture exists and it's really nice. So, thank you all.

Melissa: I have a very similar relationship with Wendy. She's always very generous about sharing her knowledge and what she does, but I think that the culture actually comes from the top down. So, this is an environment that I think has been created and it just grows because we have such a wonderful group of people.

Wendy: We do love each other. I'll just put that out there.