Graticule Novel Cohorts Podcast

Opportunities in Behavioral Health

Solving the evidence gap in psychiatric care

SPEAKERS
Dan Housman, Chief Technology Officer, Graticule
Eze Abosi, Chief Growth Officer, Holmusk

Key takeaways

- Dan Housman of Graticule and Eze Abosi of Holmusk discuss the role of real-world data (RWD) to advance precision medicine in psychiatry and mental health care
- Specialized data solutions play a role in improving outcomes for historically underserved psychiatric patient populations
- Specialized data solutions create opportunities to align mental health care with other conditions (cancer, for example) for more holistic approaches to patient care
- Graticule and Holmusk are ready to work with groups who wish to engage in this space and have the experience to help navigate a sound approach to getting started

Dan Housman
Hello and welcome to the Graticule Novel Cohorts podcast. Excited to be here today with Eze Abbasi from Holmusk. We're going to be speaking about some exciting things relating to real world data relating to mental health and psychiatry, which is a specialty area for Holmusk. We'll ask Eze to introduce himself, and then we'll have a conversation about some of the things that we're doing together, as well as some of the details about what Holmusk does.

Eze Abosi
Thank you so much. Dan, I appreciate the opportunity to be on the Graticule podcast. I am the chief growth officer at Holmusk. I have about 20 years of experience supporting data analytics platforms and consulting services across the pharmaceutical or life sciences life cycle, and value chain, with an emphasis on new products. And so, I'm the guy that typically goes out to pharma and life sciences organizations and discusses, as well as showcases, new and exciting kinds of capabilities. And with Holmusk, I have the opportunity to really just partner with our clients, as well as Graticule, to deliver a really novel type of approach for leveraging mental health RWD to ultimately better patient outcomes.

Dan Housman
That's great. Tell me a little bit more about Holmusk. I know that you're doing great work and have something that nobody else seems to have.

Ezo Abosi
Yes, Holmusk has an interesting platform to say the least. We have been in business for roughly seven to eight years now, and we are positioned as an NLP-enriched Clinical Data Platform specific to mental health, behavioral health and psychiatry.

What does that actually mean? We work with EHR data that comes from hospital systems in the U.S. When we partner with the hospital system here in the States, our data-use agreements allow us to not de identify [the data] as well as work with their traditional structured data like medication, NDCs, IC10 codes, procedures, etc., We do quite a bit of work with the physician notes. And the physician notes generally in psychiatry have been a very unique area for evidence generation. We are acquiring these notes at scale. And so, in totality, our repository includes about 32 million patients to date, many of which have enriched insights, based on our ability to work with elements in the structured and unstructured notes that are typically not included for evidence generation.

In terms of differentiators, I think about them in three different ways. First and foremost are the psychiatric scales that make psychiatry the unique therapeutic category that it is. When we think about, for example, a disease category like depression, one of the go-to psychometric assessments to understand the symptomology and severity of your patients' depression, or depressive episode, is called the PHQ-9. There's also a PHQ-2, It's the patient health questionnaire, and it's basically a series of questions the provider asks the patient to understand their mental state.

And so, what we do at Holmusk is curate that information at scale, not only at the summary level, kind of the key takeaway of whether or not this patient is mild, moderate or severe in their depressive mood or symptoms. But we also cure it at the item level, which is incredibly unique. Likewise, there are some psychometric scales that are transdiagnostic. In other words, these scales are used across all psychiatric disease categories. A really good example here is the mental status examination, or the MSE, which is distinct from the MSE that is often associated with the neurology population. But regardless, with the MSE, it's really unique because it's traditionally not leveraged in evidence generation, but it's mandated by U.S insurers. If you're prescribed psychiatric medication in the U.S., every time you interact with your mental health or behavioral counselor, you're going to receive an MSE.

In terms of verbal, often dense data, we see it at every patient encounter. We've been able to successfully leverage it in collaboration with a pharmaceutical sponsor to, for example, predict hospitalization based on a symptomatology that we can extract from it.

In summary, working with the psychometric scales is a key differentiator for Holmusk and our NeuroBlue platform. Above and beyond that key value add, we also build the NLP models.

Leveraging unique access that we have for the provider notes, we can explore different concepts. This includes anhedonia, the ability to not feel happiness, or suicidality. We can explore not only structured elements of the EHR, but also in the psychometric scales, as well as in the free text entered by the HCPs. Those are the three key takeaways in terms of how Holmusk and the NLP based enrichment of clinical data, specifically for psychiatry, is a differentiator from other offerings in the marketplace.

Dan Housman
Pretty amazing stuff. Let's get specific about some of the projects people are doing with you, because I know with a resource like you have, you could take in 1,000 directions, but what are some of the directions you've seen clients have success, as well as areas where they're pushing the envelope to use this resource to sort of move their programs forward?

Eze Abosi
Great question. Dan. Generally, as a real-world evidence platform we're serving, or really our baseline is the kind of the traditional evidence generation functions within life sciences, whether it's explicitly called the RWE team, or HEOR, epidemiology, that's our core user base.

But as we really think about addressing and delivering value to additional workflows within pharma, we're oftentimes engaging directly with the medical affairs teams who, of course, have an interest in differentiating their technology or their asset with the medical audience that they are communicating with.

Likewise, because of our deep phenotyping of behavioral health or mental health patients, we are starting to engage clinical development quite a bit. Not only in terms of protocol design, but in terms of actual activation into a clinical research study. Whether that's a registry in terms of novel or prospective data collection, or a traditional kind of patient finding for randomized clinical trials, or whether to support referrals and to establish sites. Those are conversations that are increasing in volume, quite a rapid pace.

Moving forward, Holmusk is also partnered with Datavant, a very unique ecosystem of RWD partners that allows us to basically integrate our data with another high-quality data set. The integration of other secondary RWD data assets has expanded the user base that we can serve. And so, for example, market access, in terms of being able to integrate claims with highly enriched clinical data to inform, for example, your pull through strategy, affordability strategy, or just to ensure that patients are adherence, that is a new and exciting use case that we are, that we are supporting here at Holmusk.

And lastly, prior to Holmusk, I was part of the Optum Life Sciences team, and I worked on the clinical genomics product commercialization rollout. For me, I think combining clinical with omics data is incredibly interesting, whether it's whole genome or transcriptome or the like. I'm really excited to work with our partners to integrate our deep phenotyping of mental health

patients. Why is that exciting? Holmusk's vision and our mission is to solve the evidence gap in behavioral health. We believe that we can make a meaningful impact, using data and analytics to deliver precision medicine in psychiatry, the same way that we think about precision medicine and other therapeutic categories like autoimmune or oncology. This may be possible when you take a high quality, enriched data set that's clinically-derived or EHR-derived, and combine, for example, with SDoH (social determinants of health) data or other novel data types.

Dan Housman
We're excited as well to bring some of the data sets we have access to see how we can combine them through various tokenization strategies. Can you give some examples of projects with life sciences companies, so there's some context to what a project looks like?

Eze Abosi
Absolutely. We've supported everything from feasibility to protocol design for a clinical trial through quite a bit of analysis focused on the burden of illness. Likewise, we are and have been delivering safety studies. But some of the most exciting work that I have seen is, for example, our work on external comparator arms. This was specifically a study that was commissioned by Johnson and Johnson, where we leveraged our neuro blue assets to evaluate a formulation of or various formulations of paliperidone branded as Invega. In terms of the real-world outcomes for schizophrenia patients that are utilizing different delivery and formulations of paliperidone, in terms of the 3-month versus 6-month.

Dan Housman
One thing that excites us about working with Holmusk is this crossing over into the health system workflows. You've done some work on patient identification. How realistic do you think it is that we're going to be able to stand up networks to be able to highlight the patients who would benefit from a clinical study, or get to the point where we're changing clinical practice by using better decision support delivered through the whole Holmusk platform?

Eze Abosi
Great question. It's not easy, but we are uniquely positioned to help solve this problem, specifically for psychiatry.

And so going back to our mode of partnership, in terms of building the largest research ready database for psychiatry, we have to entice our hospital system partners to participate in our ecosystem. Part of our relationship involves complimentary access to our NeuroBlue database, because many of these hospital systems themselves publish research specifically on psychiatry. Access to that database is a value add. But we also do offer provider-specific solutions to drive efficiencies in your workflow based on how you manage not only your mental health patients, but also your clinicians. In other words, when you partner with Holmusk, from a provider

perspective, you not only have access to NeuroBlue, but we also provide technology grants that allow you to improve your technology infrastructure with an emphasis on how you treat and manage your psychiatric patients.

Likewise, we deliver a tool called NeuroBlue Health, that has two value adds. First and foremost, it allows you, as an administrator, to prioritize your highest risk patients. That way you can optimize your throughput through your hospital system. In terms of ways we prioritize risk, we leverage your patient information to understand which patients under your management are most likely to end up in the ER/ED in 30 days. That way, you can dedicate your resources accordingly to the most severe or the most acute, if you will, patient profiles and individuals that you're managing.

Likewise, we do the same from the perspective of which patients you're managing are most likely to conduct self-harm, or at least attempt self-harm. In mental health, the most acute or severe outcome is mortality, and so we want to ensure that we do our best to mitigate suicide within your institution.

Finally, another unique output is the ability to understand which of your clinicians are managing which patients, and we help hospital systems understand which clinicians on staff may be trending towards burnout. That way administrators can intervene before a clinician, psychotherapist or psychiatrist on staff, works a caseload preventing them from ultimately bettering patient outcomes.

Lastly, clinical research. Because of our unique ability to better patient outcomes in terms of your throughput as a hospital system, as well as our very unique focus on building this researcher-ready repository with deep phenotyping for mental health ...our clients know that we are we are really just focused on doing this and nothing but this. They come to us and ask for opportunities to support clinical research.

To get back to your question. Can we impact better patient outcomes by thinking through opportunities to not only introduce patients to the proper clinical research as a care option, but also introduce different ways of collecting real world data and assessing outcomes for their patients? We will often, for example, collaborate with a pharma sponsor to understand if a particular institution can capture at scale different outcomes that help assess the efficacy of the treatments or procedures that they're delivering. And it certainly helps that there may be various incentives to change the behavior of how the administration [operates], as well as how the staff within a given hospital system are interacting with their mental health patients. Often can be as simple as just incentivizing them to move from paper to electronic or digital capture of their data.

Dan Housman

Is that super exciting? As folks know here, here at Graticule, we operate much like a CRO but in the digital space, and that means now we can bring clients we've been working with the ability to execute new protocols, just on the research side, and very quickly, working with Holmusk, be able to implement them in partnership. And then for building models with Holmusk, we can actually translate them all the way out to the point of care.

And also, it looks like we can work together to build a new data collection, or even just digitization of data, so that there can be visibility. That is going to move the needle quite a bit in terms of the creativity the groups we're working with have towards the kind of projects they're looking at.

Because I'd say we continue to try and help the life sciences partners we're working with to move beyond the claims-based clinical study or the big, horizontal data sets of the world. It's exciting to be able to help life sciences companies use specialized data assets [for] the benefit of the patient, ultimately.

And so that's going to be pretty exciting to be able to partner. And I think we'll end up doing some of the groundwork where there is enough scale on your side to look at a very deep problem end-to-end and be able to add in that CRO-type activity that sits on top of the Holmusk platform.

And I think there are other opportunities looking outside of mental health. I know we've talked a little bit about the fact that mental health bridges into some of the other features of drugs. An example I think we've been talking about was asking questions about GLP-1s [Glucagon-like peptide-1], which is one of the hot topics. There are both positive and negative questions being asked about GLP-1s and mental health. Some folks have correctly argued that GLP-1's are very good for things like depression and improving psychiatric features, but there's also been publications that say GLP-1's increase suicidality or other types of psychiatric conditions like eating disorders. What do you think about the opportunities to not just engage psychiatry/pharmaceutical companies, but to engage with some of these groups that might not traditionally have thought of Holmusk as an option because their drugs don't directly target the CNS (central nervous system).

Eze Abosi
It's a very innovative concept. We at Holmusk are very entrepreneurial, in our mindset, and to some degree, we have to stay focused. And so today, Holmusk is really focused on that patient that is a primary diagnosis in mental health or psychiatry. That being said, though, just going back to our hospital system data strategy and partnership strategy, when we work with the hospital system and ultimately acquire their de-identified patient records, we don't necessarily restrict any of the information they provide to us. Kind of the "Guiding Light" is to obtain data HIPAA compliance for patients that have at least one mental health or psychiatric ICD-10 code or diagnoses in their patient history.

The result is our keen focus on psychiatry, but we have quite a bit of information on their primary care, their labs, as well as their additional interactions with other specialists within that given hospital system. Moving forward, we're certainly thinking about how mental health and psychiatry impacts the patient holistically. Whether it's the patients that is treated with a GLP-1 for their obesity or for their diabetes, and assessing the outcomes, certainly feasible with our capabilities in terms of being able to not only apply insights for that patient cohort based on their psychometric scales, but also absorbing or modeling additional concepts, based on NLP that we can apply to their notes.

Similarly, another really interesting case study is the oncology population. So incredibly unfortunate if you're diagnosed with cancer, can't imagine. Thinking about the significantly large portion of cancer patients that have comorbid, for example, depression. What do outcomes in that particular population look like versus the oncology or the cancer population, by disease that may not have depression, that may be moderate or severe. We're certainly thinking about it. We're still in the very near term, kind of focused on the core psychiatric diagnoses. But it's very unique to be positioned to have an evidence generation tool that can collaborate with Graticule and assess both the physical and mental health components of a patient population.

Dan Housman
That's an area where I think it's really exciting. I know we always talk about being patient centric. That's a mantra inside of Life Sciences space. Yet at the same time, it's almost impossible not to be target product focused. For example, I make a checkpoint inhibitor. How can I keep people from being depressed? Right? My checkpoint inhibitor is not operating on depression yet.

At the same time, your outcome for an oncology patient, if you look at some of the evidence out there, is going to be dependent upon their psychiatric state, their willingness and their engagement does affect their immune system. It does affect how they respond to some of these therapies. Groups, I think, are starting to take hold of inside the life sciences business, which is that there's a target product profile that goes above and beyond that core product, which is the molecule and what it does. It goes all the way out to the patient experience and the digital experience of that patient and how it's going to affect their outcomes. So, it's an exciting space, I think, for some life sciences companies looking to move into the digital space above and beyond just their compounds, and thinking about, how do they build adherence, build engagement with the patient, engagement with the providers, so that their drugs end up having the outcomes they're looking for.

And I think this is a great space to investigate: how does it work today, and maybe even a better space for some of the things we talked about, about building in new tools. Things that can be extensions of the Holmusk platform or the EMR to be able to provide support to these

patients in oncology or in another life-threatening disease. It's really exciting to think about what the future of pharma looks like with Holmusk in the picture and with psychiatry and mental health in the picture.

As you know, I do work around anorexia nervosa, which is a psychiatric condition. I'm curious what your thoughts are in terms of getting above and beyond the conditions that already have good coverage, to working with academics and working with groups that are looking to investigate an early stage of drug development. What are your thoughts about collaborating with academics, maybe with very early-stage drug companies at Holmusk, to be able to move research forward so the drugs can actually make it into a funded project or ultimately, something that's close to approval.

Eze Abosi
Great topic. And I know this is a very personal topic to you, Dan,

In terms of evidence generation, classically within the pharmaceutical life cycle. Your evidence strategy, in terms of partnering with companies like Holmusk or the like, is relevant once you're in human trials and likely have successful data, let's say your Phase Two, that encourages you to make the explicit investments in your RWE strategy.

That being said, Holmusk, is from my perspective, kind of rattling the cage a little bit there, because in mental health or psychiatry, when it comes to RWE evidence, at scale for all disease categories, there really aren't too many options in terms of aggregators, they're trying to mass this information across multiple kind of provider entities.

We are uniquely positioned given our key focus in psychiatry, to support academic as well as biotech organizations that are pre-commercial or just even in the discovery phase. In other words, we actually have very unique data that is unbiased, normalized and highly curated with psychometric scales, as well as provider notes available for interrogation for all disease categories.

While I'm not a data scientist by trade, when I reviewed our capabilities in anorexia nervosa, I was really surprised at comorbid depression associated with this population. Secondarily, when I think of, for example, anorexia nervosa, I think of relatively young adults, if not adolescents, that are unfortunately exposed to that disease. But in terms of the insights I yielded from NeuroBlue, and granted NeuroBlue does have a unique bias on the institutionalized or the hospitalized mental health patients, but when I looked at just the spread in terms of the age cohorts associated with our population. This disease affects individuals with moderate to severe mental illness across all age cohorts or age categories. And so just being able to partner with academics or partner with pre-commercial, if not clinical stage, biopharmaceutical entities that are pursuing areas of high unmet need - from my perspective, that's why we exist, because first

and foremost, again, going back to our vision, we have the data, we are gathering the evidence to help you deeply phenotype any mental health patients.

And then secondarily, we're trying to better patient outcomes. One of the best ways to deliver patient outcomes is to support our clients in developing an intervention, a pharmaceutical device, a digital application that could help better patient outcomes for that particular profile. I am happy that we at Holmusk can contribute to the conversation for companies or academic institutions or probably researchers that have the passion to serve a population that literally has no approved, especially pharmaceutical options.

Dan Housman
In our case, one of the things we'd love to learn is what is the standard of care that we can benchmark against in terms of predicting whether a clinical trial will be effective.

In one of the projects I'm working on, there's an existing drug. It's being repurposed. It's called Metreleptin. It's a very expensive drug at the moment, and they've tested on 30 or 40 patients so far who have anorexia nervosa and seen improvements in various scales, especially depression.

And the hard part is we don't really know, because these have been open-label studies, what the baseline population looks like. If they did not get treated with this drug, and we can see amazing results in open-label studies, but they don't mean anything if we can't predict what it'll look like if we took a real study where we had an RCT. And so the thing I think we get excited about looking at a data set like Holmusk at a very early discovery stage, or even a repurposing drug stage, is: can we see what the baseline looks like, and can we understand from a prediction of what we might improve, either from preclinical data or open-label data, whether the trial we might design could be effectively powered to show an improvement, and ultimately, an improvement that the FDA would care about, and probably even more importantly, something that the clinicians would care about, which is what the FDA is going to listen to.

I'd encourage groups, even if they don't have a product already in the market, and psychiatry and are looking at doing that early-stage analysis. I think we've thought quite a bit about, how would you use this tool? And I realize, because we don't have infinite money, like the large-scale pharma companies that are already post approval, but I love the openness and the capacity to be inventive, because I think it's going to be a long journey and you can use a tool like home ask from the beginning all the way through post market approval when you're in the commercial stage.

And I think getting experience with what's out there, if there's an on-ramp, is really important, because that's just going to carry over throughout the development cycle and could be a competitive advantage when things start to heat up and there's other products. I'm very

excited about what you guys have to offer. And as you know, psychiatry is close to my heart, which is probably why we met in the first place. It will be great as we move forward and start building some projects together with existing Graticule clients, new Graticule clients, existing Holmusk clients, academics, I'm just looking forward to continuing a collaboration which I think will be ultimately beneficial to these patients who I think until now have been somewhat marginalized in terms of at least the data landscape. It was probably a lot of landscapes that marginalize the psychiatric mental health population, but let's be realistic, the oncology population has gotten massive amounts of investment into data from the government, from commercial groups, from the life sciences industry. Seems like we're in the beginning of a world where there's a huge ecosystem building up around psychiatry and around mental health, and that's what we need.

Eze Abosi
Agreed. You made quite a few points there that resonated with me, but first and foremost, just thinking about, for example, the anorexia patient population, or really any patient population within mental health where there's not been a lot of innovation from a drug development standpoint in a decade plus, realistically. So being able to serve the institutions, the companies, the researchers that are trying to understand those patient populations and ultimately better outcomes. That's why we exist.

To double down, though, what I have found incredibly interesting over my time at Holmusk is the true interest in the personalized medicine approach within the psychiatric therapeutic area. And so, you kind of hinted at it, I think one unique opportunity, which may be that moderate to severe anorexia patient with comorbid depression. And so how does drug development, or how does developing an intervention for that patient profile differ for the patients with generally, if you will, moderate to severe anorexia.

And so just having a data asset that can support that analysis, so you have the intelligence from the real world on how to just better understand outcomes. That is why we exist.

Kind of shifting gears a little bit. What's another really interesting aspect of psychiatric data, if it's collected, is the fact that sometimes the clinical gold standard in a randomized clinical trial is not collected in the real world. In other words, like all of the evidence or the verbal data elements that are relevant to every other therapeutic area, certainly oncology, that what you see in the trial is also what's observed and collected in the real world. That is not the case in psychiatry. I think there are reasons for that. At Holmusk, one of our very unique capabilities is being able to establish and decipher the same insights that you would observe in the clinical trial based on what data we are collecting in the real world. That way, ideally, our clients and our stakeholders can perform a like to like comparison of what transpires in the real world versus what may be the clinical gold standard. In a disease category like depression, for example, the MDRS is the clinical gold standard.

But we've been able to successfully map insights from the PHQ-9, which I referenced earlier, as well as the QUIDS developed by John Rush, our Chief Scientific Advisor, to essentially accomplish the exact same insights that you would glean from the MDRS. So that crosswalk analyses, that's another contribution to rural data and evidence generation that our colleagues at homeless have been able to deliver to the industry, and so we look forward to doing more.

Dan Housman
I'd be really excited about all this depression data and anorexia.

I think you started off by saying you measure anhedonia, and anhedonia at least at a severe hospitalized state, is a real problem. You know, the leading cause of death from anorexia nervosa is suicide and anhedonia, becomes very closely correlated with that.

And there's a theory at least, that body mass index is directly correlated to depression as well as the mental state. The end point in anorexia is the point to which a patient's weight is restored. But I don't think the science is great about whether and how weight restoration correlates to depression. So just looking at your data, it would be fantastic to see things, assuming there's enough data points that correlate the PHQ-9 relative to the current body mass index of a patient and come up with a way to normalize it [the data]. To see if you know what's been going on in the standard of care. And it's possible that synthesizing artificial BMI would be possible to start [to help] resolving things. There are fantastic things in terms of opportunity in anorexia nervosa.

I would imagine everybody who's looking at their specific disease of interest will have their own perspective of where they can get significant benefit from a richer data source, if they're creative about it. And then how it might move for a drug development program or drug discovery, however you want to look at the phase, move those programs forward faster.

I wanted to shift to discuss how clients that we're working with, or working directly with Holmusk, can get started. Maybe you can talk a bit about the tools you built, and we can talk a bit about getting started with clients.

Eze Abosi
Sure. The company is Holmusk, the brand is NeuroBlue. We serve two populations. We serve the provider to ultimately deliver better patient outcomes and give them tech enabled tools to do so we bring that as NeuroBlue Health. Then we also serve the researcher, whether they're in life sciences, government, academia, etc., We offer NeuroBlue Analytics. It is a self-service platform built for the coder and the non-coder. It is very similar to, for example, IHD from Penalgo, really a very high-quality evidence generation tool where you log into the cloud.

All that being said, we're flexible. In terms of a customer service perspective, what I really enjoy about working at Holmusk. We can partner with you any way that you prefer. With Graticule for example, we would have no issues with working with a sponsor, with the Graticule tool, and just enabling access to our platform so your team can do the work and derive the insights of interest to your clients.

That being said, we can also just deliver the data in your native environments, so your team can, for example, take advantage of our token and combine our very unique NLP-enriched clinical data asset with something else that's really cool.

Likewise, we do have a consulting team that can do the work for you, but our consulting teams really focus on a few different work streams, which is really thought leadership. If your goal is to publish, for example, an external comparator analysis, it may be worthwhile to engage our team directly. If your goal is to publish an abstract at a conference, we're happy to support it too. But generally, we are well positioned, as well as well-versed on collaborating with key platforms like Graticule, where NeuroBlue data can essentially power the analyses so your team can deliver the proper insights on behalf of your clients.

Dan Housman
That's great. And I'd say working with our clients, because we do touch things even beyond psychiatry or the groups we're talking to, we usually start off with the question of feasibility. We work with a client who's interested in using NeuroBlue, or maybe using NeuroBlue and other assets at the same time, it could be a project where you're considering doing data linkage.

Take it up to the top level and say, What's the problem you're trying to solve? Can we spend those 55 minutes out of the hour that Einstein recommends defining the problem, and then spend the other five minutes in that one hour to try and figure out if it's feasible?

And there's some things we can do at no cost for clients, and there are tools that our team's already versed in to be able to use the NeuroBlue platform to do simple feasibility analyzes. Obviously, we're not going to do a complete study just upon a client request, but we're going to be doing the first pass look at: is this data fit for purpose, and do we understand the ask well enough? And then we'll do another dive, probably to do a true fit for purpose study, with some kind of feasibility analysis that might generate some preliminary results that would be more like a paid engagement with our clients.

And I think there's an easy path working with Holmusk, because, as I mentioned, we have a lot of options for how we can engage work within the NeuroBlue environment, bring the data into our own environments, or the client environments, where they may have their own tools to execute the studies. But ultimately, I think the thing that gets in the critical path of these is: well defined protocols and well-defined analysis plans, well defined goals within these projects.

And we're excited to get started with groups that may not even know what they want yet, and to spend the time to shape something, even if they have some basic inkling of where value might be found, and even go back to the business side of their organization to help justify the investment they're going to make to start using a new data set, as well as using the data set for a study that they might not have had in their evidence plan.

So, I think let's get started with anyone who's out there listening, who has ideas, concepts, not necessarily a ready, baked study protocol that they want to bring to us. We can help shape it together with Holmusk to something that's going to be exciting to your business teams, to be able to invest in these kinds of projects. Well, it's been great. I don't know if you have any closing remarks you want to give us. It's been really fun talking to you today.

Eze Abosi
Thank you. I appreciate the opportunity just to join the Graticule podcast. On a personal note, I appreciate the effort and the energy dedicated to solving very complex issues for a patient population that is underserved and a personal interest to you. Dan, so this has been fun. I'm looking forward to keeping the conversation going trying to solve that evidence gap.

Dan Housman
Looking forward to it. And thanks to everyone who listened.