How Machine Learning is Driving Success for Value-Based End of Life Programs

This article is sponsored by VNS Health. This article is based on a discussion with Jordan Holland, VP of Value Based Contracting at Compassus and Mark Bailes, Director of Technical Product Management & Assessments at VNS Health. This discussion took place on December 7, 2023 during the Continuum Conference. The article below has been edited for length and clarity.

Among the many things we're going to be talking about, is how Compassus and VNS Health have teamed up, and how they are leveraging predictive analytics to inform care decisions.

Just a little bit of background on both organizations before we begin, VNS Health is one of the largest and oldest nonprofit, home- and community-based healthcare organizations in the U.S., formerly VNSNY. Compassus is another very innovative home-based care organization among those providers which have been expanding into SNF-at-home and some of the more innovative care models – not

just traditional Medicare-certified home health and traditional hospice, as we've always known them. Jordan, what else would you add in terms of getting to know Compassus?

Jordan Holland: We administer home care to individuals in 29 different states across the country. Our core services include home health, hospice, palliative care, and home infusion – and we bring that together into an integrated home-based care continuum, which is the theme of this conference. Our strategic initiatives centered on people, partnerships, and innovation. With an aging population and industry-wide workforce issues, there's a significant focus on how we can improve collaboration among care teams to successfully care for our patients and communities.

Compassus relies on several notable partnerships to bring integrated services together in an expanded continuum. Our partnership with VNS Health is designed for innovation – successfully building and leveraging new technologies to improve service and enhance care programs for serious illness, which is an organization-wide priority.

Next, is our general philosophy on product and innovation. Our focus on the product side, if we think about that integrated home-based care continuum, is to identify and address critical gaps in service that impact quality of care. There's a significant structure to how certified home health agencies with Medicare need to be licensed, bill for services, and how they may engage with those individuals, which may not necessarily meet all the needs of the patients they are trying

to serve.

We mentioned SNF-at-home, but I think about home health and home infusion more broadly, as ‘home recovery.’ What’s the biggest opportunity in home recovery right now? It’s caring for higher acuity patients in the home, in the setting where they prefer to be cared for, and where they see the best results in their recovery. That’s been the advent of our SNF-at-home model and SNF-at-home program.

A key area in product innovation for us, is the end-of-life space. The decedent rate on hospice is probably about 50%. Often, that is anchored toward very short length of stay patients receiving hospice – which is not the best patient experience, nor does it reduce total cost of care, because you’re not avoiding that high-cost utilization toward end-of-life.

So, how do you bridge those gaps in the continuum? That’s what we call our advanced care management model, which is a layer of collaborating more successfully in the community with health plans. We are using predictive analytics to identify patients that are in that end-of-life stage, and then intervening on those patients earlier through a palliative-centric model. We take a full view of an individual’s health across the continuum. Then, we identify what the right clinical model is for their individual situation -the technologies, the analytics to help successfully deploy that model.

Could you elaborate further on how Compassus is partnering with VNS Health, particularly around predictive analytics and end-of-life care?

Holland: Yes, so we partner with VNS Health as the data-driven avenue. Our focus has historically been on the VBID space, working with health plans that are participating in the hospice component of VBID. VNS Health actively participates on the health plan and the provider side of VBID, so they work with those Medicare Advantage plans to analyze their clinical claims data and to identify patients that are at the highest likelihood of mortality in the next 12 to 18, or even 24 months. Then, we leverage VNS Health's insights and perform direct outreach to those beneficiaries, to engage them in our advanced care management and palliative model.

Mark, could you similarly provide an overview of VNS Health, especially in the context of value-based care management? Being a payvider on both sides of the equation, how does VNS Health introduce innovation in home-based care solutions for end-of-life?

Mark Bailes: VNS Health is a 130-year-old nonprofit, based in New York. We are a payvider, so we have multiple lines of business on the provider side, as well as our health plans. Within our provider services, we're the largest home health agency in New York State. We also have the largest hospice. We

work with over 6,000 home health aides in our personal care division. The behavioral health division is something that's new for us in the last couple of years. We also have a care management organization within our professional solutions and a managed services organization, which is where we build a lot of the technology products we're going to talk about in just a second.

What positions VNS Health extremely well as a payvider, is that we have immediate access to our first customer, from both the provider side and the plan side of business, for any of the technology products that we build in-house. Our health plans range from managed long-term care, to Medicare Advantage and plans focused on specialized needs.

Innovation has been a cornerstone of VNS Health since its origin. Lillian Wald, our founder, was one of the first to use the public nursing terminology back in 1893. That's formed a lot of the business that we do today. Innovation for us today looks very different 130 years later. We are innovating our value-based care models by leveraging machine learning and data science products that we build in-house, and which power each one of our lines of business.

Just a little background to add, that we've reported on how VNS Health really has become a research and innovation powerhouse over the years. Not only internally, but also funding and supporting market research and clinical

studies to validate those solutions. Mark, the topic of this panel is predictive analytics in action. What value can predictive analytics offer to hospice providers? What success has VNS Health realized in utilizing its own predictive analytics solutions?

Bailes: We're very mission-driven in everything that we do, even when it comes to data science and machine learning, which is focused primarily on improving patient outcomes. Specifically, we want to provide the right level of care at the right time. We want to provide high-quality care, and especially during crisis moments, which we find is often the last seven, three days of life. None of this is news to any of the hospice providers in the room. This is consistent across the country and has been for a long time.

What's new are some of the KPIs that we use to track and measure our performance towards these patient outcomes. If you look at this across the country, there is still significant room for improvement on each of these measures. If we take the average length of stay, just as one example, the average length of stay in 2022 was about 90 days for a patient. We have many extremes of that lower length of stay and many at the higher length of stay as well. So, this is an area that we're focused on, for sure.

Another example is the difficulty in managing hospice visits during the last days of life. In 2022, the average across the country was around 49%, which means that in just about half of

the cases, we are making two visits in those final three days.

We work closely with our providers, to help them move the needle on each of these KPIs and to improve the quality of care that drives the patient outcomes.

VNS Health is addressing these big challenges with additional investments in developing machine learning and data science products to deliver more meaningful outcomes. We recently developed a mortality risk dashboard, that stratifies members within our Advanced Illness Management Program (AIM), and identifies patients with elevated risk of mortality within the next 6 and 12 months.

Our care management organization then connects with those members and their loved ones, to start educating them on end-of-life benefits, discuss their end-of-life care goals and preferences, and we can refer them into hospice earlier. We've seen the average length of stay for those referrals is 80% longer than the average length of stay from all the other referral sources that we see within our hospice. That's a significant benefit for the patient, our plan, and our provider business.

Another area of significant value here is compliance. For example, 60% of Medicare spend is actually spent on patients who have an average length of stay greater than the 180-day eligibility period. We know as an industry, that there is increased scrutiny around long lengths of stays.

So, our predictive analytics can make a real impact not just to quality, but to reducing that significant cost of 'getting

it wrong.’

Another measure we aim to improve is the hospice visits last days of life (HVLDL). We have developed a seven-day mortality risk dashboard, which again, identifies high, medium, low-risk patients in terms of their imminence within the next seven days. We piloted this solution in late 2022, then implemented it across all of our hospice teams in 2023 resulting in a 42% improvement year-over-year. . We were also able to reduce burdensome transition, live early discharge, and hospital admission rates in those final seven days. Quite a feat, given some of the clinical and workforce challenges we are currently facing in New York State.

We know machine learning is not going to solve these problems by itself. But, we view it as the key enabler to drive those improved quality operations that can have a direct impact on the patient outcomes.

Jordan, as we look at some of these areas of focus, how do predictive analytics impact your role and the conversations that you have with payers? Is this a must-have in those conversations with them?

Holland: When you talk with health plans and when you work with them on innovative models, what you’re really trying to convince them of is an outcome. There’s been this advent on the technology side that can develop dashboards and take data and analyze data and layer on predictive analytics.

However, insight is meaningless unless you attach it to some sort of clinical intervention.

How do you actually take that insight and drive action, to achieve what that outcome is? That's through validation of, "We've done this before, we can show you that we're going to deploy the combination of predictive analytics and clinical capacity to solve your challenges and achieve what the objectives are."

Why is now the right time to begin thinking about investing in predictive analytics and some of the solutions that we're talking about?

Holland: I would say the biggest no-brainer is how we can apply predictive analytics and this type of technology to drive quality care and effective deployment of clinical resources. We know that the population is aging, and we know that we're not getting more caregivers. Something's got to give there. Predictive analytics can be a huge buoy to helping to deploy those clinicians and clinical teams effectively.

I think the other side of that coin is not necessarily what you're doing to drive effective utilization of clinical resources, but what you're doing to drive the provision of access. I think about predictive analytics as, 'Is that patient likely to experience an adverse event, and can you deploy more resources at that time?' It's also, 'Is this patient out there in the healthcare ecosystem receiving services, but they're really eligible for hospice?' That's

that right care, right time transition. I think now is a really good time to think about that as well.

Just from a macro perspective, with inflationary pressures as well as just total cost of care increases. Earlier access to hospice is a great way to drive down total cost of care. Identifying patients who could benefit from in-home high acuity models like SNF-at-home and avoid a skilled nursing facility, is another good way to drive down overall total cost of care. I think about predictive analytics in both of those buckets. What can you do internally to effectively deploy resources? Then, what can you do externally to help identify patients in need and get those clinical resources to those patients effectively?

Bailes: I completely agree. Optimizing clinical workforces is a real opportunity. I think the other way to look at that question is, why would you not invest in it now? The question I'd ask hospice providers is, how else would you achieve some of the outcomes that we've demonstrated by continuing to do what you have been doing all of these years? We recently published a case study that illustrates when we deployed this technology along with operational procedures, we saw a 2% improvement in just three months, which is significant.

The machine learning technology itself is not new at this point. It's available in other industries and it's advanced. I think what is new about machine learning is being able to use it effectively. We're at that stage now, and I think that's something organizations should be thinking about, too. Again, achieve the outcomes. Frankly, there's no other way of putting it. It's the right thing to do by the patient. If you do the right thing by the patient here, it's good for business at the same time.

Has either VNS Health or Compassus had success establishing relationships with payers, contracts with payers, risk-sharing arrangements with payers based on projected savings rather than proven savings?

Holland: That’s a complex question. There are many different ways to contract for things in a value-based environment. There’s a lot of discussion already about capitation, but that’s pretty far afield for a lot of home-based care providers, largely because of capitated models, total cost of care risk is really anchored on attribution of the patient longitudinally, which is very much a primary care concept. It’s not as much a home health concept, definitely a hospice concept in a way, but if you just take a step back and recognize what all the way on the other end of the spectrum of value-based care, there are opportunities to work within pay-for-performance models where you have anchored reimbursement, based on achievement of desirable outcomes.

Then you could do that with smaller portions of total cost of care, like an episode. If any of you are familiar with the bundled payment program that CMMI continues to do, those are anchored on 90 days post-hospitalization and creating a risk element there. There’s a lot of different ways to maybe back from that full continuum risk profile in conversations with health plans, but then the goal becomes, to what outcome are you going to attribute the achievement of those dollars at risk? You might have a pay-for-performance model that puts re-hospitalizations at risk.

Then, it’s a lot easier to focus on not a hoped-for outcome, but just a historical baseline, because health plans absolutely know what their hospitalization rates in these care settings are. That is a strong anchor to project reasonable improvements against that performance.

Bailes: I don’t believe we’ve used predictive analytics to help with projected value for contracting purposes, to be honest with you. I think what Jordan just said right at the very end there around actually demonstrating this value and then using that in the future for value-based care contracting is how we’ve approached this.

Predictive analytics and algorithms in healthcare have been in the spotlight recently, but not really for positive reasons. One of the big payers out there is currently being sued with some alleging that they were using an algorithm to improperly determine who gets care and who needs to stop receiving care. That’s very different from what we’re talking about. We’re talking about using predictive algorithms to make sure more people are getting the right kind of care. Help us understand that distinction, and then when it does come to maybe some of the misuses of

predictive analytics, what safeguards should providers be thinking about to make sure that predictive analytics are used responsibly?

Bailes: So, we're using predictive analytics machine learning to help increase access to care. Like transitioning people into that hospice component. Within the provider section, we're not replacing clinical judgment in any of this. This is another data point for our clinicians to leverage as they do their practice.

We're providing transparency as much as we can into that black box of the algorithm essentially. Building trust with providers, helping them understand how to use it, and that it will never replace their job. I think that's another concern that people have, especially in other industries. Machine learning is not going to provide the care. It's just helping us understand where we need to focus, given that we have limited resources and capacity available. I think transparency, building trust with those end users, and then making sure that they're not depending on it entirely. It's another tool they can use to inform their decision-making.

Holland: The thing I'd just mention is that predictive analytics in these cases are aimed at increasing patient access and eliminating restrictions on the health planI think it's the perspective of the provider that is accountable for the patient, and so we want to do right by the patient. Our predictive analytics are focused on effective deployment of resources to keep quality high. Whereas an MA plan is about who gets access to what, at what time.

To wrap up this conversation, how do you see this area of predictive analytics growing, particularly in end-of-life care in 2024 and beyond?

Holland: We talked a little bit initially about the VBID space and what's happening there. I think VBID overall is increasing in prevalence. The hospice carve-in benefit is decreasing largely through some exits with UHC and Elevance, which took about 500,000 beneficiary lives out of the VBID model.

I think total lives in that type of model, which is more of that health plan-driven access to hospice care with the carve-in, while that might see some short-term decreases in 2024, it remains to be seen how that will increase overall. 2026 is when they're allowing MA plans to potentially restrict those networks and focus on hospice access only for in-network hospice providers. As MA presence in hospice increases, so does the opportunity to work collaboratively with health plans to identify patients who might be in need of those hospice services.

The two areas that we talked about, right care, right time, which patients are eligible for hospice and when should they be receiving them, and then when patients are on hospice, ongoing mortality predictors to identify when we need to have clinicians in the home, those are still going to be the two biggest opportunities to tackle. It will be really focused on refinement of those models, specifically around unique populations, because right now, it might feel a little peanut butter spread, but rural areas and urban areas, de-SNP populations and regular populations act and interact very

differently with the health care ecosystem, and so there’s a lot of refinement opportunities in machine learning and predictive analytics. The opportunities won’t change, but how we deploy those opportunities will significantly change in 2024.

Bailes: We will see more applications of machine learning for areas in which it can help from an operational perspective. The next step is to make these analytics part of the workflow in EHR systems. Right now, we’re providing the insights in a dashboard format. Teams are using this outside of their EHR systems to act. Integrating it within EHR systems so that it’s part of one workflow is where we’ll see the next set of values for predictive analytics.