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Interview

Enabling provider decision-making that improves quality and costs in oncology: An interview with Andrew Norden from Cota Healthcare

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Andrew Norden is the Chief Medical Officer of Cota Healthcare. Cota's mission is to enable the optimization of clinical outcomes for individual patients and to reduce the total cost of care for populations. Prior to Cota, he served as Deputy Chief Health Officer of IBM Watson Health, Attending Neuro-Oncologist at the Dana-Farber Cancer Institute, and Assistant Professor of Neurology at Harvard Medical School. He holds an MD from Yale School of Medicine, an MPH from the Harvard School of Public Health, and an MBA from the University of Massachusetts at Amherst.

Sanchay Gupta (SG): Why did you transition from practicing as a neuro-oncologist to working in industry?

Andrew Norden (AN): I was spending more effort caring for individual patients, and a lot of that effort did not translate into added benefit for the patient or science. Payer mandates required us to spend more time interacting with electronic medical records. And we faced increasing institutional pressure to see more patients and be academically productive. My work days were filled with grueling patient care that achieved poor outcomes. My nights and weekends were spent writing protocols and manuscripts.

In neuro-oncology specifically, progress is very slow. As a newly minted doctor, I accepted that my patients had poor outcomes because I believed there would be substantial changes in the therapeutic landscape. But here we are in 2018, and the reality is that brain tumor patients haven't seen a transformative therapeutic advance since 2005 when temozolomide was approved for use in brain tumors. Even in that example, the benefit is measured as a small number of months for most patients. In the approximately 10-year duration of my clinical practice, I watched targeted agents, anti-angiogenic treatments, and early immunotherapies show promise and then fail in glioblastoma and other brain tumors.

Fundamentally, I felt that the amount of benefit I can have on individual patients was limited. I wanted to be involved in work that had the potential to change some of these macro factors in a big way and I saw the health I.T. industry as an exciting means to do that.

SG: How was Watson positioned to address some of the challenges you were facing as an oncologist? What were some of the other opportunities you identified at Watson Health where AI could make a difference in healthcare?

AN: It is getting harder to deliver good health care amidst the explosion of molecular knowledge. If you're a general oncologist treating multiple types of cancer patients, it's become almost impossible to keep up.

What appealed to me about the Watson concept is its potential to look at vast data sets and find patterns, pick out the right therapy among a complex list of options, and track patients over time. No human would be able to keep that much information in memory at any given moment and extract the meaning that then influences treatment or monitoring.

The computer's ability to maintain the most current information about optimal therapy and bring that to the fore at the right point in a patient's journey is really compelling and remains only partially realized today. But as A.I. continues to evolve it's going to get better at knowing what matters.

There is early evidence of this happening, especially in the computer vision arena. I expect that image-based fields like radiology, pathology, dermatology, and ophthalmology are going to truly be transformed within the decade. I don't think this is going to make these specialists irrelevant. There are always going to be important judgments that need to be made and a certain level of expertise will be required to use these modalities.

SG: From Watson Health you then transitioned to Cota. Can you describe for our readership Cota's model? What is the Cota Nodal Address system and how does it fit into your vision of delivering precision medicine at scale?

AN: Cota connects with provider EMR systems and extracts two key types of data: structured (i.e. fields capturing specific information in pre-determined ways) and unstructured (i.e. narrative physician notes). With this information, Cota creates a longitudinal data set that describes individual patient journeys with cancer from diagnosis through treatment and ultimately to survivorship or death. We track outcomes measured in a variety of ways and can incorporate utilization and cost data.

One of Cota's unique advantages is the Cota Nodal Address (CNA), which is a new way of grouping patients based on attributes that are clinically important in driving therapeutic decisions. Think of it like a

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barcode. Scanning an item's barcode tells you everything that matters about the product: what it is, what it weighs, how much it costs, and where it's traveled from production to distribution to sale. The CNA is a similar digital approach for cancer in that it specifies all of the key patient, tumor, and treatment-related factors that impact a person over time.

Cota can use CNAs to create groups of patients who are clinically identical and one would therefore expect to be treated in similar ways and have similar outcomes. These groupings then become the lens for identifying variations in care and outcomes. For example, one can conclude, “Here's a cohort of patients who are identical and yet they're being treated in 15 different ways. And despite similar outcomes, it seems there's huge variation in the cost that they incur based on which treatments they received.” We help identify variations like this and provide data back to providers to nudge them toward optimal value-based decision making.

SG: How is Cota's approach to clinical decision-making fundamentally different?

AN: Doctors enter vast amounts of data into the EMR. Yet when they want to ask simple questions like, “How do my patients with stage IV breast cancer do?”, these are very difficult to answer. By surfacing the right historical patient data at the right time, Cota helps them answer such questions and drive practice patterns for the better.

Ultimately, there are different rubrics one can use in making a clinical decision–one can use expert opinion, published evidence, or real world data. All three approaches are important and relevant in medicine. When a patient is newly diagnosed with cancer, they often seek a talented expert whose opinion goes a long way. Sometimes it's quite a good decision, but experts also have biases. The evidence-based approach says, “We know, based on published clinical trials, that a patient like this should receive X, Y, or Z.” That too is a critically important approach. But patients in clinical trials tend to be healthier, wealthier, and whiter than average, so the extent to which results are applicable to a particular patient is debatable. Finally, the real world data approach says, “Let's look at real patients who are similar to a particular patient and see how they have done under different treatment considerations.”

Each of these decision making approaches has advantages and disadvantages. We are focused on the real world data approach. I think the best way to get to an optimal decision is to incorporate elements of all three and to select an approach based on what's appropriate for a given question. The opportunity to bring all of these together explains in part why Cota is partnering with IBM today.

SG: Could you walk us through how a provider would interact with Cota day-to-day in the context of caring for patients?

AN: Two different users in an organization interact with our software: an administrative leader and an individual provider. We have different tools for each.

For, say, the Chief of Oncology, we spotlight opportunities to reduce variation in treatment. We highlight patient types who are being treated with more variation than other patients. Some doctors see patients every month, others every quarter. Some providers order high-cost scans and routine tumor markers at every visit, others once a year. This allows the provider organization to take a look at whether a pattern reflects a best practice or is just contributing to a higher cost.

We have a separate tool for physicians to use at the point of care. This tool assigns the provider's patient a CNA, queries the same data set, and provides visualizations. In other words, if I'm seeing a patient newly diagnosed with breast cancer, the system will tell me: You saw 15 people like her in the last year, and here are the treatment decisions you made. Plus, here are the treatment decisions your colleagues made for 150 similar patients during that time. Finally, when you query the whole Cota dataset, you might learn about 15,000 patients like her across the United States. You can gain insight into their treatment decisions, outcomes, and costs incurred.

We're not saying, "With this data, we know the right answer today." Rather, we are using the data to see the spectrum of decisions and learn about how those decisions mapped to outcomes and costs. We can then help each institution to drive decision-making toward a particular set of higher-value options.

For example, we often find out that–for patients like this one–there are 10 different treatments doctors around the country routinely use. One or two have inferior outcomes and should obviously be thrown out. Of the remaining eight or nine, we might find that three have much higher toxicity. Of the remaining five, three are dramatically more expensive. So we've narrowed down to two. We can then set those treatments to be the 'preferred high-value choices' that we're driving providers towards. If you choose this option, the data suggests you are doing right by the patient.

SG: What do providers most appreciate about the tool?

AN: Providers love that it's fueled by their own data. We think of it as real-time risk-adjustment; we are grouping patients based on the set of attributes that physicians agree are the attributes that matter most. It's like getting second opinions from a large group of smart colleagues. And there is no black box algorithm operating behind the scenes. We're simply visualizing data and then letting the provider make the decision.

We think artificial intelligence will play a critical role in our business down the line. The attributes of breast cancer that matter in one year may be different from those that matter now. We may be recording things now that we do not yet know matter. With a large data set, we may be able to use A.I. to say: Among patients with this particular CNA, it looks like there are in fact two cohorts that differ by some particular attribute. CNAs are a grouping mechanism based on today's best knowledge; we can use these insights to build the next generation of CNAs.

SG: One critique of personalized medicine is that more targeted drugs have so far come with more expensive price tags. For example, the cystic fibrosis drug Kalydeco costs about $300,000 per year per patient. Dr. David Blumenthal has predicted that these personalized therapies are “going to exact a high price on families that have sick members” and other healthcare leaders have made similar statements. How would you respond to this claim?

AN: The cost of novel therapies is a huge problem. We see this issue in oncology, when a new drug that hardly moves the needle in terms of clinical outcomes is priced high. I believe that the better we can define the population who most benefits from that drug, the more cost-effective our use of that therapy will become. In that sense, Cota can help by refining our understanding of the optimal treatment populations. There's a multi-billion dollar opportunity to reduce inappropriate use of drugs, to reduce the use of excessively toxic drugs.

That said, there is a limitation here. If you introduce a new and expensive drug today, it takes time to accrue experience with that drug and real-world data. Cota can help refine our understanding of who should receive that drug, but it's not going to be the whole solution. We need other approaches from the FDA and others to help us make value judgements about brand new drugs.

SG: Relatedly, at the HIMSS18 conference in March, your team talked about moving from precision medicine to precision payment. Can you tell us a little bit more about your thinking around this?

AN: If we're routinely measuring outcomes in the real world, then we have a much more granular ability to pay for outcomes than exists today. If we can precisely define upfront the right cohort of patients to be treated with the right drug, then we can avoid the onerous bureaucratic-driven processes that happen today. In other words, if we have compelling data that says a patient with a given CNA should optimally be treated with one of two regimens, then we can avoid requiring prior authorization for those regimens. And we can negotiate a price for those regimens based on the expected costs from similar patients treated in the real world.

This gets to work that we're doing right now with Horizon Blue Cross Blue Shield and other payers. The idea is to develop bundled payment or episodes-based payment models where both the payer and

provider are comfortable with a certain amount of dollars being spent upfront because they have enough comfort with historical cost trends for very similar types of patients. Of course, we have to account for scenarios where a patient has some completely unrelated and expensive complication, like a car accident, or a brand new and costly drug gets approved. Broadly, though, if we define the clinical cohort clearly based on historical data, then we can shift financial risk to providers in a way that they can be comfortable with.