

# PRECISION FOR BETTER HEALTH OUTCOMES—ADVANCING PRECISION ONCOLOGY: PREVENTION, EARLY DETECTION, AND TREATMENT

**Announcer** 00:00

Please welcome the panel on "Advancing Precision Oncology: Prevention, Early Detection, and Treatment," moderated by Alan Tisch, CEO and founder, Atria Health and Research Institute.

**Alan Tisch** 00:40

Thank you for having us. We are all so fortunate to be here in Abu Dhabi, a place that is focused on building the future world that we all want to live in. Cancer is horrific, and while we haven't cured cancer, precision oncology has changed the landscape recently. It feels today like we are at the precipice of the largest positive change in cancer screening, prevention and treatment than ever before in history. Precision oncology, using individual genetics and cancer biomarkers to point to the right treatment at the right time for the right patient, is leading that charge. But there are also new technologies, screening, prevention and treatments that are emerging every single day. On today's panel, we're going to explore the state of play, what the coming decade looks like, and how we may actually cure cancer in all of our lifetimes. I'm so honored to be joined by an exceptional group of leaders in Abu Dhabi and globally, on this panel today: Dr. Georges Haber, the CEO of Cleveland Clinic Abu Dhabi, Dr. Nicole Sirotin, the CEO of the Institute for Healthier Living Abu Dhabi, Majed Mohammed, head of community engagement and advocacy for Friends of Cancer Patients here in the UAE, and Simranjit Singh, CEO of Guardant Health, Asia, Middle East, and Africa. First, I want to start by asking each of you, what does precision oncology

mean to you, and how is it different than the approach that we've traditionally taken over the past few decades? Simranjit, we'll start with you.

**Simranjit Singh** 02:23

Sure. Thank you, and happy to be here as well. So precision oncology, I think, has taken and has grown leaps and bounds. So if you take, for example, lung cancer. Lung cancer, in the past, was treated as two blocks, non-small cell lung cancer, small cell lung cancer and adenocarcinoma and squamous within non-small cell lung cancer, and that was how it was treated. In the 1980s, 1990s you probably had a survival rate for advanced lung cancer about 10 percent to 15 percent, now with precision oncology, with biomarker-driven targeted therapies, with immunotherapies, you have changed that landscape. Survival rates are now up to about 40 percent to 45 percent. You have early lung cancer detection with new technologies, which allow you to have survival rates of up to 85 percent in some health health-care systems. That is the impact that precision oncology has made already.

**Alan Tisch** 03:26

Dr. Haber, leading one of the great academic institutions here, treating patients on the front line. How would you define precision oncology? And why this approach is different than what we were doing 20 or 30 years ago, when you might have been in residency?

**Georges Pascal Haber** 03:40

So you know, until recently, the way we treated cancer, it was almost one size fits all. There's few different chemotherapy treatment that will be used for certain cancers, but the outcomes of those treatments were not optimal, and more than this is the side effects that you're getting because of those chemotherapy. So patients will be going under horrendous chemotherapy regimens, and at the end of the day, we look at the CAT scan, the tumor is not shrinking, and the patient lost their hair, unable to walk, and have all those issues. So now we're moving from a one-size-fits-all treatment to a more tailored treatment. So what we can do right now, for example, if we see a tumor on a CAT scan, we can biopsy it, get the somatic sequencing, sequence the tumor, understand what type of mutation, and try to adapt the treatment, tailor this treatment to the specific tumor, to the specific mutation, and try to guarantee those type of outcomes and minimize the side effects. You look fast forward a little bit more, now we can take the tumor and grow it outside of the body, build organoids out of this tumor, and try different treatments, and make sure—

**Alan Tisch** 04:52

In the lab.

**Georges Pascal Haber** 04:52

In the lab. And make sure we're getting the right treatment for the right tumor, minimize the side effects.

**Alan Tisch** 04:57

So you're saying, you can basically biopsy, grow it in a lab, run a bunch of experiments to try to treat the cancer in a lab, see what works, and then go and treat the patient?

**Georges Pascal Haber** 05:08

Absolutely.

**Alan Tisch** 05:10

Modern science is amazing. We'll come back.

**Georges Pascal Haber** 05:12

It is happening now, by the way.

**Alan Tisch** 05:14

I know. We'll come back to that in a minute. I want to talk about immunotherapies. mRNA, so we'll come back to that in a moment. But you talked about the pain when people go through cancer treatment, losing the hair, the anxiety, the embarrassment, and Dr. Sirotin, you founded and led the Institute for Healthier Living, thinking about the impact of metabolic health lifestyle. But for a moment, we'll get into prevention later, but for a moment, for patients that aren't going through—that are going through cancer treatment, what is the impact of lifestyle, nutrition, movement, these types of things during that and how does that impact outcomes?

**Nicole Sirotin** 05:51

It's a great question, because one of the advances that we have developed, and one of the areas we've really developed, is actually understanding the relationship more between metabolic risk and cancer risk, not just on the risk of developing cancer, but also on the impact of the treatment, the efficacy of the drugs, and in addition, the risk of metabolic disease after cancer. For a disease like breast cancer, most women

will have a higher risk of cardiovascular disease when they're done with their breast cancer treatment. And so, really thinking about—and conversely, we now know that people with cardiovascular disease have a higher risk of cancer. And so really understanding how the disease processes on a biologic level intertwine, has helped us think about the patient more comprehensively. One of the programs that we built at Cleveland Clinic, Abu Dhabi in the cancer center, is this program on understanding and treating cardiometabolic risk during cancer treatment, because we recognize that actually, if you can help someone control their blood sugar, control their cholesterol and exercise during and after their cancer treatment, their cancer treatment is more effective. And so really implementing these not only before, where someone doesn't have cancer and they're really trying to prevent it, but even during their cancer risk—I mean, during their cancer treatment.

**Alan Tisch** 07:23

And we'll come back to the kind of, you know, association. But you mentioned having cardiovascular disease or metabolic syndromes increase the incidence rate of cancer and change outcomes. Like in this room, everybody loves data and stats. So like, do you have any sense of what type of increase of, you know, cancer risk for someone with cardiovascular disease or type 2 diabetes, you're seeing?

**Nicole Sirotin** 07:45

Absolutely. So there's very clear relationships between both obesity and 13 specific types of cancer. So, that is very clearly delineated. We're now seeing, and those cancers are some of our most common cancers, breast, colorectal, etc. There's also a risk of cardiovascular disease, increasing your risk of also breast cancer and colorectal cancer. So, part of the reason this is is because there are some shared mechanisms, and that at the heart of it is really about inflammation and the control of the immune system. And so where we have inflammation in the body, we know that this is also a risk for cancer. If you have a high IGF-1 level, this is again, a metabolic derangement that we see in people who have diabetes and heart disease, then that also increases your risk of cancer at a molecular level, and so we're seeing those shared mechanisms.

**Alan Tisch** 08:46

Thank you. So, we're going to get a little bit later in the panel into specific technologies, mRNA or immunotherapies or liquid biopsies. But we live in a world today where every third conversation involves AI. It's been talked about in the cultural zeitgeist that AI might have the opportunity to cure cancer, right? That's the promise of AI. OpenAI has promised to put over \$20 billion into a medical foundation focused on finding a cure for cancer. So, I guess I would love to open it up, just because it's so time sensitive. What impact do you see artificial intelligence playing in oncology, either treatment or screening today and in the next five years? Simranjit, we'll start with you.

**Simranjit Singh** 09:34

Sure. So I mean, if you look at the fact that there are 3.2 billion permutations in terms of DNA sequences and the addition of that in terms of methylation signatures, so epigenomics, all of that information coming together to be able to provide understanding of cancer at the crux, will require computation, will require AI. And that's something that we've been using, at least in part of our technologies as well. A lot of machine learning goes into understanding what particular types of cancers, what typical mutations are driving the cancers, different specifics, and then, more importantly, being able to match the right therapy for that particular cancer. These are also now important mechanisms, as Dr. Haber has also mentioned, in terms of organized development. You are now being able to look at specific drug development processes using AI that you can be able to accelerate drug development because you are able to use AI to be able to find the right target for the right particular therapy, right protein target, right molecular target, and that makes the therapies so more effective.

**Simranjit Singh** 10:48

Absolutely.

**Alan Tisch** 10:48

So, it's almost—Dr. Haber just talked about we can biopsy something, grow it in a lab, and test things. What you're saying is the next step is we don't even need to grow it in a lab, and we don't even need to test things. AI can do that in real time with hundreds of thousands of options.

**Alan Tisch** 10:50

Wow.

**Georges Pascal Haber** 10:51

I'm going to interject here.

**Alan Tisch** 11:00

Please.

**Georges Pascal Haber** 11:01

So, I'm a big believer in AI, and I think it is the biggest disruption that is going to have in health. And if there's one industry is going to benefit the most from AI is going to be biology, life sciences and health care. However, as of now, we can develop models and use transformer models and those different things to decide on the protein plication, but we still need to test it in the lab. So, we can develop those simulation but as of now, we still have to.

**Alan Tisch** 11:38

Ten years from now, do you think we'll need to?

**Georges Pascal Haber** 11:41

I don't know. With AI, I cannot what's going to happen in six months. So, 10 years is very far, but as of now, when we develop those new drugs, we have to test them in the lab. So what we're seeing happening right now, we're seeing automated labs that are linked AI and with like, robotic arms that will, like, give you a different type of molecules, and those molecules will be tested, and one will be selected out. So, this is, I think, what we're going to be seeing in the next three to five years, 10 years, I don't know, probably we'll be able to simulate all this, but the combination of AI and testing is going to be transformational.

**Alan Tisch** 12:21

Thank you for grounding us on the reality of where we are today. I think we're all optimistic and future looking, especially sitting in Abu Dhabi, but reality sets in sometimes. But there is, and Dr. Haber, you and your institution are leaders in the field, some technologies that are being used in clinical practice today that are changing things. And in particular, I would love for you to share, over the previous few years, the impact of robotic surgery entering into the operating theater, and why robots may be better than humans and what that looks like today.

**Georges Pascal Haber** 12:52

Let me reground everything for a second. I will tell you what's probably going to happen in the future. I'm a robotic surgeon. So, this is my specialty, I'm a urologist, you know, I do robotic surgery. What I tell my patients is the robot is not going to operate on its own. So, any movement that will do with the tip of my fingers will be reproduced inside of the abdomen.

**Georges Pascal Haber** 13:17

I've done it so many times, I can do it in my sleep now. So, every movement the robot is not going to move on its own. And this is very reassuring to patients, as of now, probably in the future, this will change, but

right now, the surgeon is in control of those movements. What the robot adds, it augment the skills of the surgeon, so it will remove—if the surgeon has a tremor, it will remove the tremor. It will be much more precise. We will be able to see much better, because there's a magnification of the visual field, blood loss is less because we're using increased pressure, air pressure, inside of the abdomen to compress the vessels. So, we can see how technology is augmenting humans or augmenting surgery. So, fast forward, what we're starting to see now is now we're adding different layers of technology. Now we're adding surgical navigation using immunofluorescence. We're probably going to do fusion of images between MRI images and the images we're seeing during the surgery. What we're starting to see now is we can put guardrails on the robot, and for example, let's say we want to excise a tumor. Let's say there is a ball and we want to excise it. Now, the robot can tell us how much we can go to the side and avoid damaging the surrounding tissue while making sure we're removing the whole tumor. So.

**Alan Tisch** 13:17

Look at those hands, it's beautiful.

**Alan Tisch** 14:29

Is it improving outcomes? Since you brought robotics into the operating theater?

**Georges Pascal Haber** 14:33

Absolutely. I'm looking at one of my colleagues. You do more open surgery, right? So Dr. Arie Beldegrun, and who's a urologic oncologist, also the father of CAR T cell, probably talk about immunotherapy. So, I have to watch—I have to watch what I say, because it's a debate between open and robotic surgery. So, as a robotic surgeon, absolutely, we, you know, there's multiple prospective studies that showed that using robotic surgery does improve on outcomes. Especially blood loss, lengths of stay, reduce the risk of infection. Also, when we look at, for example, which is my specialty, prostatectomy, we can see that there is better continence rates and just the outcomes are getting, you know, showed to be a little bit better. So, there is, let me tell you—I'm sorry, I'm taking the whole, but what's going to happen in the future, now, we can leverage AI to start training the robot on different movie, surgical movies and synthetic movies, right? How to do automated surgery, so the robot now can start doing parts of the surgery on its own while the surgeon is supervising it. Also, 10 percent of the people are benefiting from the better outcomes of robotics by leveraging automated surgery, leveraging remote surgery, now we can democratize surgery. Now, patients across the globe can benefit from the better outcomes of robotic surgery, and this is what we're going to see the next five years. So, this democratizing of surgery, this is—

**Alan Tisch** 16:03

So, when you when you say that, and you kind of briefly mentioned, it remote surgery. You could be sitting here in Abu Dhabi performing a surgery on someone in Africa or Asia, just by sitting at a computer and seeing a screen or wearing VR goggles.

**Georges Pascal Haber** 16:17

Not, we could, we did it.

**Alan Tisch** 16:19

Yeah.

**Georges Pascal Haber** 16:19

So we had the surgeon at Cleveland Clinic Abu Dhabi. We had the patient in Pakistan, and we removed the kidney from Abu Dhabi on a patient in Pakistan.

**Alan Tisch** 16:30

That's amazing.

**Georges Pascal Haber** 16:31

So, this is happening now. We also did another procedure between Cleveland, Ohio and Cleveland Clinic Abu Dhabi. So, you see how now we can leverage the expertise and the skills, the subspecialists across the globe tailored to one patient.

**Alan Tisch** 16:48

Yeah. Dr. Haber, thank you. I feel like we could probably go on for an hour about robotics and AI, but I want to switch gears for a moment. Majed, AI, not necessarily changing the way that support and advocacy organizations support cancer patients, you took on your role in 2020 in the middle of one of the more interesting times in health care in history, right? COVID, and as Friends of Cancer Patients, an advocacy organization, is it one size fits all? Or what is the role of advocacy organizations as it relates to personalizing their care and helping them navigate within the UAE ecosystem?



**Majed Mohammed 17:25**

Right, well, thank you very much for the question. Coming from a nonprofit, charitable organization, and it's very important for us, through our work and through our engagement, to raise and translate the patient experiences through meaningful engagements and also discussions, especially with regards to policy dialogues. Now, with the emerging trends of you know, adaptation of digital health, now we are moving from digital health into digital and health approach, where we are trying to incorporate the digital tools into the health-care ecosystem in a meaningful way by all—but also addressing the patient needs and perspectives into these integrations. It's very important for us as a patient organization to have the patient on the table of discussions. When it comes we are having our engagement either with the policymakers, the public and the private sectors, is very important for us to have the patient's voice heard and also considered while translating and also implementing policy designs, community outreach programs, and interventions. Because when it comes to precision medicine, we look back into the, you know, the test, medical test, the patient history, multiple factors, but sometimes the patient voice and the patient perspectives are neglected in a way. We have encountered many patients and cases into our office where they feel they are lost in the health-care system, they are unable to, you know, get up, you know, clear information about the side effects of the treatment, the outcomes of the treatment. So, we as a patient organizations, we can jump in to support them to the navigation system, with the health-care providers, with the health insurance system, and make sure that they get the accurate information to support them throughout the journey. Aside of that, as well, some, you know, when it comes to the word cancer itself, in the community, we have achieved multiple milestones to, you know, attacking the stigma around the cancer self. Unfortunately, some people still feel the stigma is, you know, it's like a karma or it is a, you know, an evil eye behind getting cancer and many other myths and misconceptions. So, throughout the years we have been able to tackle these misinformations by providing the accurate information, but also incorporating the patients in a meaningful way, meaning we are having the patient with us throughout the program design, taking their perspectives and their expectations from different stakeholders. It's very important for the patient also to not just ask for help from the health-care provider, but also share the perspectives for the policymakers. We have been engaged with the Ministry of Health and Prevention since two—early 2000s when they have first launched their National Cancer Strategy. And we have been, you know, engaged in these discussions from early on, and we are hoping, you know, to continue this approach in a more meaningful way and to ensure that patient voice are heard and also addressed in different policy dialogues and also global platforms.

**Alan Tisch 20:51**

Thank you so much, and your organization is truly incredible, the impact that it makes, both in outcomes and the way that people feel and the families feel through this process. So thank you for the work that you do. So, we're sitting here in the UAE what has become probably the gold standard of how to think about population-level health. Almost 100 percent of Emirati citizens and have the luxury of having some type of genetic sequencing done, and/or genomic sequencing. And genomics are changing the state of cancer, cure, risk stratification, prediction, treatment. I guess, Dr. Sirotin, I'd love to ask you, how are you integrating and how do you think about integrating genomics into proactive cancer prevention and personalization of those types of care pathways?

**Nicole Sirotin** 21:39

Thank you. This is an active area right now of development, and the—His Excellency Mansoor, this morning, discussed a little bit about the very exciting things that we're doing with the Department of Health in this area, and so with the Emirati Genome Project, we have an opportunity, unlike anywhere else in the world, to be able to combine both a genetic risk and localize that risk, so understanding what a genetic risk of someone's of—specific cancers. Now, that's one piece, which is very important. But as I discussed, we now understand that there is this intersection between metabolic risk and cancer risk that are both overlapping and also confluent and so on top of that, we are developing risk scores for metabolic disease and actually combining this risk for an individual. What this means is that you would understand, as an individual in Abu Dhabi, you would understand your risk of specific diseases like obesity or cardiovascular disease or diabetes, in addition to specific cancer risks, like breast cancer, like cardiovascular—like colorectal cancer, like thyroid cancer. In addition, we are working with the Buck Institute for Aging and the Department of Health of Abu Dhabi and the Institute for Healthier Living to actually combine those risk scores and validate them here, which means you would really understand your global risk. And then what do you do with that information? We're helping to design intervention programs that actually will treat you at your risk, right? So, we will be able to personalize the way in which you can help yourself, and the health sick care system can help you, and will be paid for, right? To be able to reduce that risk. And this is not happening anywhere else in the world.

**Alan Tisch** 23:38

No. I mean—it's totally unique. So, the idea that you have a government and leadership that says you're at high risk for this, we don't ever want that to happen. We're going to pay to make sure that doesn't happen, it's totally unique and groundbreaking.

**Nicole Sirotin** 23:49

Unfortunately, everybody only makes money when you get sick.

**Nicole Sirotin** 23:49

And, I think this is one of the most important things around the concept of healthy longevity that's—that also came up earlier this morning, right? No one pays to keep you healthy right now, and so actually—

**Nicole Sirotin** 23:58

Exactly. And so one of the major innovations that's happening here is that the incentives are aligned, right? The incentives are aligned in the right way to actually help us get to that point.

**Alan Tisch** 24:14

Speaking of prevention screening, population-level diagnostics, and prevention, Guardant Health, one of the leaders in the space, you have a liquid biopsy, multi-cancer panel called Shield in most areas of the world, and Simranjit, I would love for you to share a few moments and share maybe examples. I know there's one in Japan, maybe the US, but elsewhere for you at Guardant, what do public-private partnerships look like and how have they been successful at early cancer detection at a population level?

**Simranjit Singh** 24:47

Sure. So, I think in terms of public-private partnerships, I think those are absolutely essential, right? They allow us to be able to test it. They allow us to be able to understand the risks in the population itself, and more importantly, we have done quite a number of them across, as you mentioned in Japan, we have done in the UK. But more importantly, I wanted to touch about what we have done here in Abu Dhabi. I think the visionary leadership here in Abu Dhabi is fantastic, and it's really a testament to us looking at the future. I think His Excellency mentioned that Abu Dhabi is the lab of the world. And so we—when we looked at our colorectal cancer screening test, which incidentally, is the first blood test to be approved by FDA for colorectal cancer screening. We approach Abu Dhabi public health centers, and they work with us collaboratively, with our partners here, M42, with Cleveland Clinic as well, and many other partners, to be able to then look at a pilot project to do colorectal cancer screening here in Abu Dhabi. Colorectal cancer is the highest mortality cancer in the GCC

**Alan Tisch** 26:04

And very hard to screen for.

**Simranjit Singh** 26:05

And very, very hard to screen for. The screening rates in Abu Dhabi, or GCC as a whole, is less than 10 percent. So this is, this is a huge—

**Alan Tisch** 26:15

So you're going to lower your prices so we can give it to everyone in the population, right?

**Simranjit Singh** 26:18

So at a population level—I mean, I think the value that you're going to be getting from the screening and the ability to be able to find cancer early will help the entire health-care system, right? Because you're going to have tremendous amount of savings from doing that. And when we did that together with IFHAS, the 64 IFHAS clinics here, and the network, they have been wonderful. I think that model of operational efficiency that we have seen here in Abu Dhabi is one that we are now putting as a playbook to replicate elsewhere globally. We've also done PPPs in Japan, for example. Another area where we think we could actually look at in the future is not only in terms of early detection, but in advanced therapies to be able to bring therapies to market much quicker. So we did an entire public-private partnership in Japan with the government, with 280 advanced cancer hospitals, and we went after the three most important cancers with the highest prevalence and mortality rates, colorectal cancer, lung cancer, and gastric cancer. And we were able to then use liquid biopsy to be able to screen. Twenty-five biopharma companies came together. We accelerated clinical trials recruitment, and more importantly, from 36 months, as Dr. Haber mentioned, it's important to do clinical testing, very important. And from 36 months, we were able to accelerate approvals to about 18 months.

**Alan Tisch** 27:45

Wow.

**Simranjit Singh** 27:46

And this was transformational because—

**Alan Tisch** 27:49

Right, we need to shorten the gap in between science and medicine.

**Simranjit Singh** 27:51

Absolutely.

**Alan Tisch** 27:52

Bench to practice is really what part of the goal is, is like, we don't need to take 17 years, which is the current gap, to go from science labs to clinical practice.

**Simranjit Singh** 28:00

Absolutely, right.

**Alan Tisch** 28:02

And, Dr. Sirotin. Right now, obesity, insulin resistance, type 2 diabetes, cardiovascular disease, other metabolic syndromes, have clearly been linked to higher incidence rate of cancers and worse outcomes. Globally, there is a GLP-1 phenomenon that is going on, and they are being used for cardioprotective, neuroprotective, type 2 diabetics, people that want to look a little bit better when they go away on vacation. Do you believe that GLP-1s could have a population-level impact on reducing cancer rates over the coming years?

**Nicole Sirotin** 28:40

Yes, I do. I think that these types of drugs are, right now, being considered on a repurposed drug list. What that means is it was approved for one purpose, and now we're looking at studies on how we can apply that in different disease states. And the GLP-1s are ranking very high on a list of drugs that are being considered for longevity purposes. And why? Because they're actually getting at the root cause of a pathway of biology where metabolic disease and cancer are shared. And so there are around 10 drugs that are on that list, and they're actively being studied. I agree with Dr. Haber. We still need studies. We can't go without them, but we need to be able to speed them up. We can use both the AI technology and the organoid technology to also speed up some of those, some of those studies in very specific areas, but GLP-1s are being shown to reduce mortality, all cause mortality, mortality from cardiovascular disease. They're also actually working in areas that we didn't imagine they would from a psychological perspective. And so there's certain psychological diseases, unfortunately, not yet, dementia. That study just came out negative, but I think that these are very promising. And again, it comes back to the biology. What is driving both of these disease pathways? At the heart is an area of inflammation that is in addition to IGF-1 signaling and really the glucose insulin pathway that we can see as a root cause for both cancer and the metabolic disease.

**Alan Tisch** 30:26

Thank you. Dr. Haber, oh sorry, go ahead.

**Georges Pascal Haber** 30:28

No, no, I think I'm going to get myself in trouble here, but, well, this is not a medical recommendation, but I think they need to put GLP-1 in the water. I mean, and we're—

**Alan Tisch** 30:39

Microdosing.

**Georges Pascal Haber** 30:40

And I'm, you know, I'm all about evidence-based medicine, and I think, you know, GLP-1s are a drug that have been tested for over 10 years on diabetic patients, and now we're extrapolating it for weight loss, and it's showing amazing results.

**Alan Tisch** 30:56

And all cause mortality reduction.

**Georges Pascal Haber** 30:58

Yes. And now there is a huge body of evidence that is showing decreased risk of inflammation, cardiac, decreased risk of Alzheimer and so on. And there is not one day where there is not the paper in a good journal talking about the benefits of this. And we're seeing the regulator is starting to adapt to this. In Abu Dhabi now GLP-1 is not only approved for diabetic patient, but also for weight loss. You look at the Trump Administration, 50 percent cut, reduced the cost of GLP-1. So, we are seeing now regulators starting to adapt quickly to it. And I think if we want to decrease the cost of health care and we want to have healthy population, they should put it in the water and delete it from all your cameras here.

**Alan Tisch** 31:44

Because essentially, you could put it in the oil as well. You know.

**Georges Pascal Haber** 31:48

Water is much better.

**Alan Tisch** 31:49

I agree. But yes, right? If we think about at a population level, over a long period of time, how do you change outcomes, extend healthy lifespan, have higher GDP productivity and reduce health-care costs. We're better off investing in prevention than new treatment pathways, undoubtedly, right? But, you know,

it's interesting, if we think COVID happened, the development of vaccines were based on a technology called mRNA, right? Moderna. And here we are today. And from my understanding, many of these personalized n of 1 vaccines and immunotherapies are based on mRNA as a technology, right? Yet, mRNA and vaccines have become a very political topic around the world, and you probably have about 50 percent of population walking around thinking that mRNA was a failed technology. It was funded, you know, in America for a long time, and Dr. Fauci and it's become political, but share with me what is the role that you are seeing for mRNA as a technology in cancer treatment today, and is mRNA a part of our future as it relates to oncological care?

**Georges Pascal Haber** 32:55

For me, question? Okay.

**Alan Tisch** 32:57

Yes, sir.

**Georges Pascal Haber** 32:57

So, I think what Moderna and mRNA opened is—open people's eyes on immunotherapy. This is a field that had been understudied for very long time. And again, I feel like wrong answering this question when I have the father of immunotherapy sitting in the room here, but please correct me if I'm saying something wrong. Long time ago, nobody knew how to spell immunotherapy correct, and now we're seeing the role of immunotherapy, not only in cancer treatment and precision treatment of cancer, but we're also seeing in the treatment of other immunological disease, MS and on, and I think it's going to be transformational. I think it is going to transform how we're going to care, not only for cancer, but a lot of other diseases. And I may, you know, venture here saying it will probably play a role in diabetes and a lot of different chronic disease. So, huge role for immunotherapy, and this is frontier medicine, and this is the future of health care.

**Nicole Sirotin** 33:43

Yeah, let's talk about early screening. Can it be done at a population level? Simranjit or Dr. Sirotin, would love to hear your thoughts in particular, like, can Abu Dhabi or can the UAE be the example for the rest of the world for how to do population-level early screening, risk stratification, and is it one-size-fits-all, or should it be targeted?

**Nicole Sirotin** 34:35

Absolutely. If you don't mind, I'll comment. I'll lean on you on the technology part. So this is, this is where we are headed, and we're headed for it to be tailored and personalized. Why? Because, should everyone have these tests that are out there that do a multi-cancer look? That's still an outstanding question. And we also know that we can combine both novel technologies, meaning some of the tests that we've heard about, in addition to traditional screening. So for example, there's a group at MIT that developed a AI-based protocol just based on a normal mammogram with no history, no family history, no genetic risk known, and actually they can predict a five-year risk of breast cancer from patients off of one mammogram. So, what that does is actually help us take a mammogram image and then decide, should that woman get their next mammogram in five years versus one year, right? So that can radically change the way in which we approach traditional screening. When you look at the risk stratification work that we're doing right now with the Department of Health, we will be able to understand the population and really put them into very granular buckets of high risk, medium risk and low risk, which then allow us to take an individual and say, we can see that this is your risk. And I hope that we'll be able to do this and see that at 20 or at 15, because what we also know is that cancer is presenting itself earlier and more aggressively, right? So, what we can see is on a population level here, the regular screening guidelines are not necessarily adequate. We know that breast cancer is diagnosed earlier, 45 percent of all cancers are under age 50, compared to 8 percent in North America or Europe. And so the guidelines need to change. And so part of what we're doing—

**Alan Tisch** 36:33

Why is that? Why the disparity? I apologize. If you have a point of view?

**Nicole Sirotin** 36:36

It's a very good question, and I think we don't have a clear understanding of that yet, but most likely—

**Alan Tisch** 36:41

Is—it might be correlated with the incidence rate of type 2 diabetes?

**Nicole Sirotin** 36:44

Exactly.

**Alan Tisch** 36:45

In country and region.



**Nicole Sirotin** 36:46

Yes. So, we have some of the highest rates of diabetes. We diagnose heart disease 10 years earlier than North America, and we have 70 percent of males at age 30 are obese or overweight. So, we really have a very high burden of metabolic disease. One of the other layers, though, that is important to understand when it comes to cancer risk is also environmental exposures. So, part of what we're doing with the Department of Health is actually combining, again, the risk, the genetic risk, with the metabolic risk and environmental level. And so we're working to help understand how those risks intersect, because we know that there are some people, for example, who might be at a higher genetic risk for a certain cancer, and that environmental exposure brings on that cancer earlier. So, really understanding the complexity of the biology and the environment in addition to the lifestyle, is where Abu Dhabi is leading the way, and hopefully we will be able to develop the system in a way that each individual will understand their risk, understand their risk early, and have very clear guidelines for how they can mitigate that risk.

**Simranjit Singh** 37:56

I think it's also important to look at a multifactorial way of screening. And I agree, traditional screening methodologies have its place and will continue to have its place. Some new technologies that we are thinking about, and we have developed, is methylation based. So, now you're understanding epigenomics, which are the switches that turn on the disease, and we are able to now look at these switches and different signatures for different types of cancers. So, when we looked at now a multi-cancer test, we have a cancer test that is for 10 different types of cancers. We were one of the two that have been selected for a national population health screening program called the Vanguard Study in the US, and we are able to now be able to look at methylation signatures for each of these specific cancers, to be able to detect them much earlier. They are then put into a diagnostic journey. You are able to look at the origin of that cancer, the site of origin, and then you are able to then do follow-ups with traditional screening tools, because you're going to be able to look at that follow up and be able to detect the cancer at the earliest possible time. Why is that important? Survival rates are very, very high in colorectal cancer. If you detect it at stage one cancer, you are able to get a 90 percent survival rate. If you are detecting it at a stage three cancer, it drops all the way down to about 10 percent. So, it is, it is monumental to be able to look at population screening. The other important thing that you need to look at screening programs is, of course, costs. And you mentioned that earlier, it's important to be able to look at it from the type of tests you are using. It needs to have specificity that is really high. Why is that important? So, that you are not wasting resources with high false positives. In that way you are screening and you are screening patients that might ultimately not really have cancer, and you are expending tremendous amount of resources. So, it is important for that, but you still need to make sure that the sensitivity is high to be able to get through cancer as well. And so this kind of test is important when you're looking and deciding how to run these population health screening programs. And most importantly, from an Abu Dhabi perspective, the efficiency that you have with the IFHAS clinics, the promotion and awareness that is being done to be able to promote that. Eighty percent in terms of breast cancer screenings that have been done here, in terms of compliance rates, one of the highest globally, that those learnings can be used as a population health and I think that's one of the reasons why we feel really strongly when we think about Abu Dhabi as a space for multi-cancer screening.

**Alan Tisch** 38:51

Thank you. We only have a couple of minutes left, and I know in these Milken environments, the audience always likes a bit of controversy and, you know, outsider opinions. So, I'd love to just go and have everyone answer two rapid fire questions in our last few moments. The first is, can we cure cancer or eradicate cancer by 2050? And if so, what's the most likely pathway to do that? Is it focused on prevention, treatment. Dr. Haber?

**Georges Pascal Haber** 41:11

You started by asking, what's going to happen in five years? 10 years now, 2050 so—

**Alan Tisch** 41:15

I said controversy. People want to know your thoughts. Sorry, it's not on the record. It's Chatham House rules.

**Georges Pascal Haber** 41:21

Just to think scientifically here, let's say you know the cancer is happening because there is like the cells are dividing, and there is like some mutation, and there is something that break up, and there is they're dividing much more and not dying. This is kind of what cancer is, just from a basic perspective. As patients are living longer, and those cells are dividing constantly, they're going to be some incidents, and you're going to develop cancer. As we're working on longevity, and patients are living longer, we're going to see more cancer. In fact, right now, if you look, 80 percent of patients of 80 years old have prostate cancer. So, I think the number is—

**Alan Tisch** 41:59

So, part of cancer is a disease of aging?

**Georges Pascal Haber** 42:02

It is a disease of aging the cells. You know, I'm talking here like very simplistic, okay, so I think what will happen with early screening, secondary screening, prevention, and so on, we will turn cancer from a deadly disease into a chronic disease. And if we can turn the treatment of cancer from treating it, from

what we know it now, to like treating hypertension or diabetes, I think this will be good and we learn to live with it and keeping the quality of life.

**Alan Tisch** 42:36

Cancer is a disease that only comes about after 80 years old. We've won.

**Georges Pascal Haber** 42:40

We've won. Either will be able to cure it, or we were able to live with it. I think this will be, you know, a win.

**Alan Tisch** 42:47

Dr. Sirotin.

**Nicole Sirotin** 42:48

I think the technology is coming for us to actually get at the root cause of aging in a way that will help prevent many cancers. And yes, I agree with Dr. Haber, there still will be cancer, but we will be able to identify it and eradicate it before it develops into what we know as cancer. We can already see advances right now with some of the of the drugs that are being developed, which, right now, there's at least 20 drugs that are in phase three or higher level that get at a root cause of aging in a way that will—could fundamentally change the way in which chronic disease, including cancer, develops in the body. So, if you're talking about 2050, I would say yes, we will have a methodology that helps prevent most cancers on a mechanistic level. And in addition, I agree we will—when those cancers do arise, as they will, we will be able to treat them effectively and early.

**Alan Tisch** 43:51

What an exciting time to be alive and be here in Abu Dhabi. And Simranjit, and I'll turn it over to you for your thoughts on, can we cure cancer, and what's the most likely pathway to do so or invest in?

**Simranjit Singh** 44:02

I wholly agree with Dr. Haber, actually. I think it's going to be one that becomes from an acute disease to a chronic disease. And management would be important. And the way to do it is to move from managing

disease in the advanced stage, to move it to be able to detect it much early, and to be able to actually have an intervention of that disease, rather than managing the disease, and early screening programs can only occur through public-private partnerships. It's a combination approach. It's one that will require the entire ecosystem to come together. And more importantly, I think Majed and advocacy groups have such an important role to play, because the patient is really at the center of what we are doing. It's all about us. Ultimately, all of us have family members who are going to be impacted by cancer, or ourselves impacted by cancer at some point in our lives.

**Alan Tisch** 44:53

Thank you. To close it out, I want to ask you a specific question about that. Majed, I was coming to you. Your organization is at the front line of being advocates and supporting patients in these cancer journeys, and today, we haven't yet cured and eradicated it and it's probably not going to happen soon. What can everyone in this room be aware of, as we have family members, friends, colleagues, that might be going through a cancer journey of how we can best support them, how we can support organizations like yourself, what can we learn from the incredible work that you've done for how each of us as leaders and individuals can support those in the community that might have cancer?

**Majed Mohammed** 45:29

Thank you very much for the question. Now, just to complement the discussion and share the perspective of a patient organization. Since our inception, 1999 under the patronage of Her Highness Jawaher bint Mohammed Al Qasimi, the wife of the ruler of the emirate of Sharjah, we have dedicated our work to realize her visions, to see a world where cancer is no longer disrupts the lives of cancer patients. And this couldn't be, you know, happen without the effective public and the private partnerships that we have established throughout the years. One of our leading success story is the Pink Caravan, where we provide free mammogram screenings, education, and community awareness throughout countries, across different cities and also reaching the rural areas across the UAE. And we have been successfully conducted thousands of screenings, of which we have unfortunately identified cancers with positive cases. And for us as a patient organization, we have taken the role to cover the entire journey and expenses of cancer patients. Last year, 2024, we have provided the support to over 1,000 cancer patients with more than 9 million dirhams throughout their journey. We are have been there with them in every step of the way. So again, to conclude the discussion, and I know we are running out of time, public-private partnerships, it's very crucial for us to, you know, consider throughout our strategic interventions and future plans, and also having the patient involved throughout the journey, having their perspective heard in order to achieve the best optimal results.

**Alan Tisch** 47:07

Well, Majed, I want to thank you. I hope that 25 years from now, the other three guests will have eradicated cancer so your organization won't be needed, but until then [inaudible]. A great amount of

gratitude to all of our panelists. I want to thank you so much, and to the audience, thank you all so much. Thank you.

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