

Deirdre Connelly
North Carolina CEO Forum
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Thank you for that kind introduction, Billie.

It is a great honor to be part of this gathering of North Carolina business leaders. Like you, we at GlaxoSmithKline are proud to be a member of the North Carolina business community that the Governor spoke about so passionately. And what a pleasure to hear from General Colin Powell.

As you've heard, "innovation" is the theme of this year's North Carolina CEO Forum. And this state is committed to innovation – powered by government, business and academia working together. That ongoing commitment and partnership is one of the many engines of progress that makes North Carolina such a great place to live and work.

And innovation is crucial to North Carolina's success in a globally connected world that demands we be as highly educated and creative as the next guy in Japan, China or India, and that we come up with better ideas than they do, faster, and more often – preferably at less expense. This rapidly shrinking global cycle -- from innovation to implementation and back again -- significantly raises the bar for business success.

Innovation demands curiosity, vision, risk-taking, and the personal commitment required to push through the inevitable challenges that occur on the path to doing what other people say can't be done. I would argue that being curious, having a vision, taking risks, and boldly committing yourself as a business leader to driving change is not confined to a strategic 5-year planning cycle. Innovative thinking and committed action must be part of everyday leadership if we want to survive and thrive as a business.

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Over the last five years, we've had to innovatively transform the way we do business at GSK in order to survive and thrive. Those innovations have changed how we discover, how we sell, and how we price our medicines.

Although they were implemented in different aspects of our business, they have two things in common:

first, with each innovation we didn't just move further down the track we were on – we jumped tracks;

second, those innovations have been critical to sustaining our business for the long term.

Jumping tracks is not a trivial matter. Change is hard – the usual order is upset, feathers get ruffled, empires end, and you may not win any popularity contests, especially in the short-term. You also have to make sure your business doesn't run off the rails – so to speak – even though you're jumping tracks.

One of the major ways we jumped the track at GSK is in how we have, quote, "re-personalized," our approach to R&D.

At GSK our mission is pretty simple: it is to help people do more, feel better and live longer. We do that by discovering and developing medicines and vaccines to help people stay healthy or get better. Seems pretty straight-forward, but it is actually quite complicated.

Research and development for a new medicine often takes a decade or more, costs hundreds of millions of dollars, and involves many more failures than successes. That's exactly the opposite of what's needed to succeed in that rapidly

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shrinking cycle of global competition from innovation to implementation and back again.

For years, pharmaceutical companies strove to succeed in this high cost, high-risk business by industrializing their approach to research and development. We went big. We used the power of computers to run a high-tech dating game where we checked millions of chemical compounds against biological targets to find possible matches. The development of that capability was a tremendous advance. It helped us identify those molecules with the most potential to put into development.

But from there, scientists with different specialties, such as biologists or chemists, for the most part, worked separately and handed off to one another as needed. Our industrial approach tended to limit collaboration.

To complicate matters further, those researchers might have been working in different locations around the world. To collaborate, they had to book telephone or video conferences with their colleagues in say, Italy, or the UK, or the US.

And this approach did not produce the level of discovery and innovation to generate the new medicines and vaccines needed to serve patients and sustain our product portfolio. In fact, the productivity of pharmaceutical research and development has remained essentially flat since the 1950s. At the same time, costs have increased substantially. Clearly, these trends had huge implications for the sustainability of our business.

So what could we do to improve our chances for success?

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One approach would have been to stay on that track and hope that by tweaking the model, and moving further down the track, we could get to where we needed to go.

But instead, we decided to jump tracks.

We set aside the industrialized approach and set out instead to “re-personalize” research and development.

What does that mean?

Our idea was to bring together, into one unit, in one place, the people from various disciplines – like chemistry, biology, genetics – who were working in a particular drug therapy area.

Our belief was that if we put smart, creative people together and gave them the right tools and opportunities to collaborate, good things would happen. The chemist might be exposed to some work in biology that sparks a new idea. The biologist might get an insight from a geneticist.

So five years ago, we broke up the assembly line and created small teams, some with only a handful of scientists. Each team works on a particular disease or biological pathway. They are responsible for discovering and doing the early development work on potential new medicines in that area.

Currently, we have almost 40 of these teams researching everything from gene therapy for rare immune diseases to epigenetics.

Now, making the shift in our R&D organization from the industrial to the personal approach wasn't easy. We upset the usual way of doing things. We ruffled many

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feathers. We ended some empires. And for a while all the change wasn't popular with those who liked the way we had always done things.

But it was absolutely necessary to do what we did to spark the innovation that is the lifeblood of a pharma company. Without new products, our business is not sustainable. We cease to exist.

So, is our effort to establish smaller, more agile teams and to "re-personalize" our approach to R&D generating more new medicines and helping people do more, feel better and live longer?

We think so.

Since 2011, we've led the industry in the number of new drug applications that have been filed with the FDA. We have also brought more than 10 new medicines or vaccines to market – not improved versions of existing treatments – but new products.

So what do those numbers mean for patients – for your mother, your father, your sister, your kids, or yourself?

Well, if someone you know has melanoma or skin cancer – the fastest-growing cancer worldwide – they now have new treatment options. And they have one of these new treatments a lot sooner than they would have if we were still doing research the old way.

What I'm referring to is a new GSK medicine that's indicated to treat certain types of metastatic melanoma. Metastatic melanoma is a devastating disease with very low survival rates and few treatment options. We discovered, developed and

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brought this medicine to market in less than five years – almost four years faster than the average time in our industry.

So thanks to our innovations in R&D, we now have a strong pipeline of potential new medicines coming to the commercial side of our business for use by doctors and patients.

That's research.

So now, let me tell you about one of the many ways we've innovated in how we sell our medicines.

First, let me give you a little context. I have worked in the pharmaceutical industry for more than 25 years. I started my career as a sales professional with Eli Lilly in the early 80s.

At that time, sales professionals were paid a salary. That was it. No bonus. No incentives.

Through the late 80s, 90s, and early 2000s, as our industry launched more and better medicines, the competition got tougher and our sales forces got bigger. As they did, we started paying sales professionals a bonus based on how many prescriptions were written by the doctors they visited.

Now, this incentive structure of bonus based on volume of sales is common in many industries. People who sell more are rewarded with more money. That makes sense.

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But in the business of healthcare, there are clearly times when our medicine might not be the best option for the patient, and more prescriptions are not necessarily better.

So, over time, our industry had developed and accepted a way of doing business that was out of touch with the goals of those we serve. We lost sight of our responsibility to focus on the best interests of the patient. In short, our model was not helping us align and build trust with our customers. It wasn't a sustainable business model.

Fast forward to a couple of years ago. During a meeting with a group of our sales professionals in New York City, we discussed the lack of trust some doctors and patients had for our industry. As we talked, this issue of bonuses came up.

Our own sales professionals argued that giving bonuses to them based on the number of prescriptions written by doctors didn't necessarily align with the physicians' goals for their patients. Equally as important, that industry model was increasingly contrary to the values GSK has as a company – values of transparency, respect, integrity and a focus on the best interest of patients.

That meeting was a wakeup call. So, we jumped tracks.

We redesigned and implemented an entirely new incentive compensation system and way of doing business for our sales professionals. The new approach rewards our professional representatives for their excellence in scientific knowledge, as well as their understanding of the business and the needs of doctors and patients. Their success is based on customer evaluations and on the overall performance of their business unit – not on the number of prescription written by doctors they speak with. Our sales professionals no longer have an objective to get as many

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prescriptions as possible – just the prescriptions that are right for the patient. This is an innovative approach that no other company in our industry is yet using.

In making this move, my team and I had to think about the risk of running the business off the rails. We did ruffle a lot of feathers. We ended some kingdoms and, for a while – given the magnitude of the change on the organization – I don't think I would have won Miss Popularity.

But we balanced all of that with the need to run our business in a way that would be sustainable and better aligned with the needs of patients and the high expectations of our customers.

I must tell you that some people think the changes we've made are crazy. That we've gone too far. That our changes would hurt our business. That our best sales professionals would leave the company.

In fact, our US pharma business is growing. And our best sales professionals under our old system are still the best under the new one. And our customers have noticed.

One of our sales professionals who works in Southern Colorado told me about an encounter she had with a primary care doctor in her territory. The doctor asked her about treating a patient with one of our urology medicines. Without identifying the patient, the doctor described the patient's age, condition, and lab results. Based on that information our representative gave the doctor several reasons why our medicine would not be indicated for that patient.

The doctor was surprised that our rep didn't seize the opportunity to have the doctor write a prescription. But following the conversation with our sales rep, the

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primary care physician consulted with a specialist and another course of treatment was chosen.

We didn't sell any medicine that day, but the patient got the right treatment. Based on that, I'm confident that the next time our professional representative talks to that doctor about who is and who isn't an appropriate patient for one of our medicines, our sales rep will have earned that doctor's trust.

So I've told you about how we've jumped the track in conducting our research and in how we're selling our medicines. Now I'd like to share some thoughts on how we have innovated in the pricing of our medicines.

We are blessed in this country to have access to a strong system of health care. Yes, we complain about it. Access isn't perfect. But compared to many countries, our system remains the gold standard.

GSK does business in about one-hundred-seventy countries around the world. Some of those countries are in developed markets like the US – but most are in the “developing world.”

As I have said, our mission is to help people do more, feel better and live longer. It doesn't say “if you can afford it.” At GSK, we cannot accomplish our mission if our innovations – our medicines and vaccines – are unaffordable to millions of patients who live in the poorest countries of the world.

At the same time, we have a responsibility to our shareholders. We must provide them with a return on their investment, and we must be able to fund the very expensive and risky research I talked about earlier.

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Again, think about sustainability. We can't give our medicines away – we'll go out of business. And yet we can't meet our responsibility to society if our medicines are out of reach for millions of people who need them.

So what do we do?

We could continue down the track of pricing our medicines based on their value in the developed world and wait, perhaps for decades, for the economies of the least developed world to catch up. Or, we could jump the track and try a completely different approach to pricing. And that's what we did.

For many years, we have used "tiered" pricing for our vaccines to accommodate a nation's ability to pay. Four years ago, we extended that tiered pricing to include some of our newest and most innovative medicines.

Today, in the poorest countries, where 700 million people live, we price our medicines at no more than 25% of their price in the most developed countries. In the relatively more affluent countries, such as China or India, our prices are somewhat higher than in the poorest nations, but below our prices in the most developed countries, like the US or UK.

This approach works. It gives people the ability to get the medicines and vaccines they need. Proof lies in the fact that our largest business in the world on a volume basis is in India, even though it is only a small percentage of our global sales on a dollar basis.

We've also applied our core competency – discovering and developing innovative medicines and vaccines – to address health challenges in the world's poorest countries where tropical diseases, like malaria, are a major threat to health.

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In fact, we've been researching a vaccine to prevent malaria for over 30 years, and have invested more than 300 million dollars into that effort. We now have a vaccine-candidate that has shown good initial results against the disease.

One of our employees, a physician named Ripley Ballou, has been involved in this quest for twenty-six years. Before he joined GSK, Rip was a young Army doctor working at the Walter Reed Army Institute of Research.

If you Google his name, one of the first things that pops up is a photo of him in 1987 sitting at his desk, smiling, in his light green army doctor uniform. His left arm is outstretched on his desk and he has a small carton taped to his forearm. The carton contained five malaria-infested mosquitoes that, in the name of science, Rip was letting bite him. He was doing this to see if an experimental vaccine would protect him against malaria.

Unfortunately, Rip got sick, as did several others who participated in this test. But one colleague was protected.

For the first time, there was reason to believe a vaccine against malaria was possible. Collaboration between Walter Reed and GSK ensued. Later, Rip left the Army and joined GSK. He is still working on a malaria vaccine today.

Now, for someone like Rip Ballou, a lifetime of work on something as important as a vaccine to prevent malaria is pointless if the people who most need it can't have it. But that won't be the case.

If our malaria vaccine is approved and recommended for use, we've committed to sell it at a price that covers the cost of production and generates a small return of five percent. That return will be reinvested into further research and development for a second generation vaccine or other tropical diseases.

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That's a sustainable approach.

So I've told you about innovations we've made in how we do research, selling, and pricing. As you can see, we're committed to trying radically new ways to operate our business so we can be more effective and better meet the expectations of our customers.

Many times, we've jumped tracks to do so. It's not always easy and, yes, we've had to manage a few challenges to keep our business moving forward in the short-term. But it's worth it.

So, I encourage you to look for ways to improve the performance and sustainability of your business by doing more than just moving down the track. Sometimes you have to jump the track.

True innovation demands curiosity, vision, and risk-taking. It also takes your personal commitment and courage to push through the barriers faced on the path to doing what people say can't be done.

At GSK, that approach to innovation is giving us the ability to help people do more, feel better and live longer.