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Why healthcare innovation must be a team sport

The future of healthcare will be built by ecosystems that learn, fail, adapt and scale – together. **By Rena Dharmawan**

IN 2020, Singapore was at the peak of the Covid-19 pandemic.

Doctors needed a quick way to detect exposure to Sars-CoV-2 to trace the path of the virus. At that time, testing could only be done with live viruses and in highly secure biocontainment facilities, meaning that the process was slow, time-consuming and expensive.

Clinicians shared what they knew with scientists, and worked together to find a solution. From there, the first-of-its-kind Covid-19 test was developed. It allowed faster contract tracing because it could detect the Sars-CoV-2 neutralising antibody without the use of a live virus.

cPass was created by a team led by Duke-NUS researcher Professor Wang Linfa, in collaboration with biotech firm GenScript Biotech Corporation and the Diagnostics Development Hub (DxD Hub) hosted by the Agency for Science, Technology and Research.

DxD Hub translated the cPass assay from research workflow to a regulated clinical test kit. After clearance by the Health Sciences Authority of Singapore, DxD Hub produced the first batch supplied to local hospitals.

This is a prime example of how doctors, academics and businessmen can work together on medical breakthroughs and bring these solutions to market fast to save lives.

Pressing need for healthcare innovation

Today, beyond the pandemic, healthcare is under immense pressure – ageing populations, chronic disease, rising costs and a stretched workforce.

At the same time, medical science and technology are advancing faster than ever. Artificial intelligence (AI), robotics, digital health and precision medicine promise extraordinary gains.

Yet, many of these innovations struggle to move from pilot to practice. The problem is not ideas. It is integration.

True healthcare innovation does not live in a single place. It emerges when healthcare, education and industry move together – not in parallel, but in partnership.

What is missing today

Every day, clinicians see where care can be safer, faster or more humane. Universities generate new knowledge and talent. Industry knows how to scale solutions to reach millions. Yet, these worlds often operate in silos.

Engineers design without fully understanding workflow realities. Clinicians struggle to test ideas beyond their institutions. Companies hesitate to invest when evidence or adoption pathways are unclear.

When this happens, innovation becomes slow, expensive and misaligned with real needs.

But when collaboration works, the results are unmistakable. Diseases are detected earlier through smarter imaging tools. Patients recover faster with new methods of minimally invasive surgery. Seniors who choose to live on their own can remain safe through remote monitoring.

These present real outcomes: fewer complications, less suffering and better quality of life.

Trust across sectors enables beneficial technology to be born and deployed effectively.

Why the three-way partnership matters

For Singapore, the opportunity is clear. We already have world-class universities, highly trusted healthcare institutions and a growing medtech and healthtech industry.

The real value will come from weaving these pillars tightly together.

When universities, hospitals and companies collaborate closely, innovation bears fruit earlier because real clinical problems guide the design of new solutions. Talents also become industry-ready because students learn in live healthcare environments.

Risk is shared wisely, allowing bold ideas to mature without overwhelming any single sector. Economic and healthcare goals align, strengthening both national resilience and patient care.

These possibilities underpin why I started the Duke-NUS Health Innovator Programme in 2023. It assembles a multidisciplinary student team to work on an unmet clinical need, under the watch of dedicated industry and clinical mentors.

Through such programmes, I have seen what becomes possible when these worlds intersect early.

Ideas take root and begin to take shape. From early sketches to real-world possibilities, they grow into innovations worth protecting.

Along the way, patents are filed, such as one for a tool to help children wear contact lens with ease and a device that prevents perinatal tears during natural childbirth.

In the process, young talent learns to speak the language of medicine, engineering and business all at once. Clinicians see their daily frustrations translated into testable solutions. Industry partners gain early insight into real unmet needs. No single group drives the innovation, but together, they accelerate progress.

What must change to scale this nationally

So, why is collaboration still the exception rather than the norm?

Because ecosystems do not form by chance. They must be designed and sustained.

When universities, hospitals and companies collaborate closely, innovation bears fruit earlier because real clinical problems guide the design of new solutions.
PHOTO: BT FILE

First, we need long-term platforms, not one-off projects. Innovation requires continuity for talent to grow, relationships to deepen and technologies to mature.

Second, we must create and legitimise new clinician-innovator pathways. The future healthcare leader will not only treat patients or publish research, but also translate ideas that reach across engineering, policy and industry fields. These hybrid careers must be formally supported.

Third, we must better align institutional incentives. Universities reward publication, hospitals prioritise service, and companies answer to markets. When success metrics clash, collaboration slows. National frameworks can help unify how we define and reward impact.

Finally, we must recognise that trust is strategic infrastructure. Sustainable partnerships are built not only on contracts, but on relationships that survive setbacks and evolve with time.

From capability to connection

Singapore does not lack talent, technology or ambition. What we must now strengthen is the connective tissue between our institutions. The next phase of healthcare innovation will be driven by deep, deliberate collaboration rather than isolated brilliance.

When education, healthcare and business move together, innovation moves from invention to implementation. And for patients, that difference is everything.

The future of healthcare will be built by ecosystems that learn, fail, adapt and scale – together. If we get the connections right, the benefits will extend far beyond our hospitals, shaping care not just in Singapore, but across the region and beyond.

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