

### TREATING CHILDREN WITH GLUE EAR

SGINNOVATE WORKS WITH SCIENTIST-ENTREPRENEURS TO BUILD AND SCALE THEIR COMPANIES. IN THIS ISSUE, WE CHAT WITH DR LYNNE LIM, CO-FOUNDER OF CLIKX, A COMPANY SUPPORTED BY SGINNOVATE.

While on a humanitarian mission to Cambodia, Dr Lynne Lim realised that some children who suffered from glue ear were unable to get the treatment they needed, despite having trekked for days to meet the medical team to seek help.

Glue ear is a condition that happens when fluid is chronically trapped in the middle ear space behind the ear drum. It can result in complications such as recurrent ear infections, fever, hearing loss, poor speech and learning development, and even brain infection. In the event that medication fails, grommet tube surgery is required.

However, such a surgery requires general anaesthesia, a well-staffed operating theatre, and an expensive and bulky microscope. These necessities could be inaccessible to children in impoverished countries.

"It was very frustrating," Dr Lim says.

But one day, the solution to this challenge came to her in the unlikeliest of circumstances – while watching her daughter get her ears pierced.

It was then that she began dreaming of a device that would safely insert grommet tubes with the click of a finger, in the same manner that ear piercings are done via a piercing gun.

Dr Lim calls it her "aha" moment. "I needed a super-intelligent device that would not need a surgical theatre, general anaesthesia, or a microscope," she realised. "Something I could pop into my bag and do surgery anywhere, for anyone, at any time."

Such a device, she says, could help millions of patients



Demonstration of how the handheld device, CLiKX, is able to drain fluid from the ear with a single 'click'.

Photo: Dr Lynne Lim

worldwide, and save billions in healthcare costs as well. In fact, grommet tube surgery is the most common surgery done under general anaesthesia for children worldwide, with an estimated 16 million surgeries needed to treat glue ear each year.

With her 25 years' worth of experience as an Ear Nose Throat (ENT) surgeon, Dr Lim kick started the CLiKX project with NUS Engineering Department's Professor Tan Kok Kiong in 2011. With \$500,000 from the A\*STAR Bioengineering Program Proof of Concept Grant, the team – including engineers Mr Gan Chee Wee and Dr Liang Wen Yu – developed the first prototype over the course of eight years.

Cut to today, and the team has come up with a product that is hand-held, and can insert a grommet tube safely and precisely without the need for general

anaesthesia and an expensive microscope. CLiKX is poised to enter the world market as a proudly made-in-Singapore product, with the first-in-man trial targeted for the second half of next year.

The team is currently seeking Series A funding for the company, and Dr Lim hopes to see CLiKX in use in Singapore and the US by 2022.

But things were not always rosy. At the beginning, the Medical Technology (MedTech) ecosystem in Singapore was nascent. Their A\*STAR Proof of Value grant ended in 2018, and although they already had a working prototype at that point, they needed additional research funding to get the prototype ready for first-in-man clinical trials.

They also had many more things to consider –



The team behind the development of CLIKX (From left: Mr Gan Chee Wee, Dr Liang Wen Yu, Professor Tan Kok Kiong, Dr Lynne Lim, Miss Jasmine Qiu)  
Photo: Dr Lynne Lim



Dr Lynne Lim on the humanitarian mission to Cambodia in 2018. The trip sparked the research on CLIKX. Photo: Dr Lynne Lim

manufacturing, regulatory approvals, clinical trials and commercialisation – but investors in Singapore preferred later-stage products that had been de-risked, which contrasted with the high-risk invasive nature of MedTech surgical devices like CLIKX. Other investors, says Dr Lim, wanted too much control of the direction CLIKX was going towards, for too little, and too early.

Dr Lim calls this time “the sickening valley of death”.

Despite all the challenges, Dr Lim and her team were determined for their project to succeed and help bridge the gap between the public health problem and the medical technology needed. In July 2018, the team finally got their lucky break when SGInnovate came aboard as the host institution, and they received National Research Foundation Gap Funding to continue developing CLIKX.

“We are grateful as we are one of the first MedTech teams to tap this fund, it being set up only in 2018,” she says. “Mr Steve Leonard, founding CEO at SGInnovate, has taken a very hands-on approach with CLIKX, and it has made all that difference.”

The SGInnovate team is currently helping to get CLIKX’s clinical trial and investment ready, and has appointed project leads to help the team drive the work, she added. In the meantime, the team is still working on improving the device so that it works even for patients with challenging ear anatomies.

“I hope to see CLIKX help more doctors to help more patients,” she says, “and I hope to see it help patients assess the care they need easily and safely, and help governments reduce the burden and cost of glue ears.”

## Up close with Dr Lynne Lim

### What are your thoughts on innovating for the real world?

Innovations for the real world have to be the simplest, most cost-effective and sustainable solution to a real problem. It must not be an innovation just to publish a paper, grab glory, or generate business. The best innovations would not just aim for minuscule incremental improvements – a new version every year makes it expensive for the end-user, even though it may make business sense. It takes clear thinking, patience and nerve to deliver an innovation that can really change practice and make a difference.

Just-enough-tech that simplifies and reduces cost; tech that is sensitive to the economic climate and needs of the time and geography; tech that is

naturally adopted and sustained – that is how I like it.

It is important to think many steps ahead in a Medtech-type surgical innovation like CLIKX where there is high risk and a seven- to ten-year runway before market. Even when one is still unsure about one’s first prototype, one would need to have the heart to start considering practical issues like getting regulatory clearance, legal issues, cost, manufacturing and distribution, first markets, and workable business models. Though that seems impertinent, it allows one to get a better product, and in a shorter time.

You will need passion, but also the determination to take many cold, hard looks at your own innovation.