

# Faster swab tests with locally made robot

Shabana Begum

A robot that carries out nasal swabbing to diagnose Covid-19 has been developed by clinicians who say the automated procedure is safer, faster and more comfortable compared with manual swab tests.

The clinicians said the robot, called SwabBot, is the first in the world that allows patients to fully control the swab process.

Patients can activate and terminate the test at will.

A patient sits in front of the robot, similar to how he would take a mechanised eye examination.

After he activates the robot, the swab will extend from the machine and into his nose to the back of the nasal cavity, which is typically about 10cm from the nostrils. The process takes 20 seconds, which is faster than a manual swab test.

The machine was developed by



Dr Luke Tay, a consultant at SGH who was part of the team that developed the robot, demonstrating how a patient would position himself when undergoing a swab test done by the SwabBot. ST PHOTO: ONG WEE JIN

clinicians from the National Cancer Centre Singapore, Singapore General Hospital (SGH) and Duke-NUS Medical School, in partnership with medtech company Biobot Surgical.

The team said the robot can address the limitations and risks of manual swabbing. These include reducing swabbers' risk of exposure and the need for training people.

The clinicians also wanted to make the swabbing procedure more comfortable for patients.

Although some find a typical swab test very uncomfortable, it is

generally painless. There may be some degree of discomfort or ticklishness, and patients may feel like sneezing or coughing during the process. Some patients may tear up as well.

To date, a total of 85 patients from SGH and Bright Vision Hospital as well as volunteers have participated in the ongoing clinical trial that compares SwabBot against manual swabbing.

All the participants said the procedure with the robot was either equally or less painful compared

with getting a manual swab.

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# Safer, faster tests with Singapore robot swabber

Team behind robot says procedure is also more comfortable than manual swab tests

Shabana Begum

A robot that carries out nasal swabbing to diagnose Covid-19 has been developed by clinicians who say the automated procedure is safer, faster and more comfortable compared with manual swab tests.

Although other countries have developed similar robots, the clinicians said this bot, called SwabBot, is the first that allows patients to fully control the swab process so they are more comfortable.

A patient sits in front of the robot while holding on to the handhold, and latches his nostril onto the disposable nosepiece.

After using his chin to push a button and activate the bot, the nosepiece moves slightly upwards to widen the nostril. The swab will extend and rotate safely and gently

through the patient's nose to the back of the nasal cavity.

SwabBot has a built-in feature that withdraws the swab stick if there is resistance when it is moved deeper into the nasal cavity. If patients feel uncomfortable at any point, they can stop the process by moving their head away from the robot.

The process takes 20 seconds, while a manual swab test can take twice as long. At the end of the procedure, a medical worker will open the machine to remove and store the swab stick.

The robot, including its interior, will be wiped down and covered with a fresh plastic drape fitted with a nosepiece for the next patient.

The machine, which is 35cm by 40cm, and 49cm high, was developed by clinicians from the National Cancer Centre Singapore (NCCS), Singapore General Hospital (SGH)

and Duke-NUS Medical School, in collaboration with medical robotics company Biobot Surgical.

The team said the robot can address the limitations and risks of manual swabbing. It reduces swabbers' risk of exposure to the virus and the need for training people, standardises the consistency of swabs taken, and increases the efficiency of conducting swab tests.

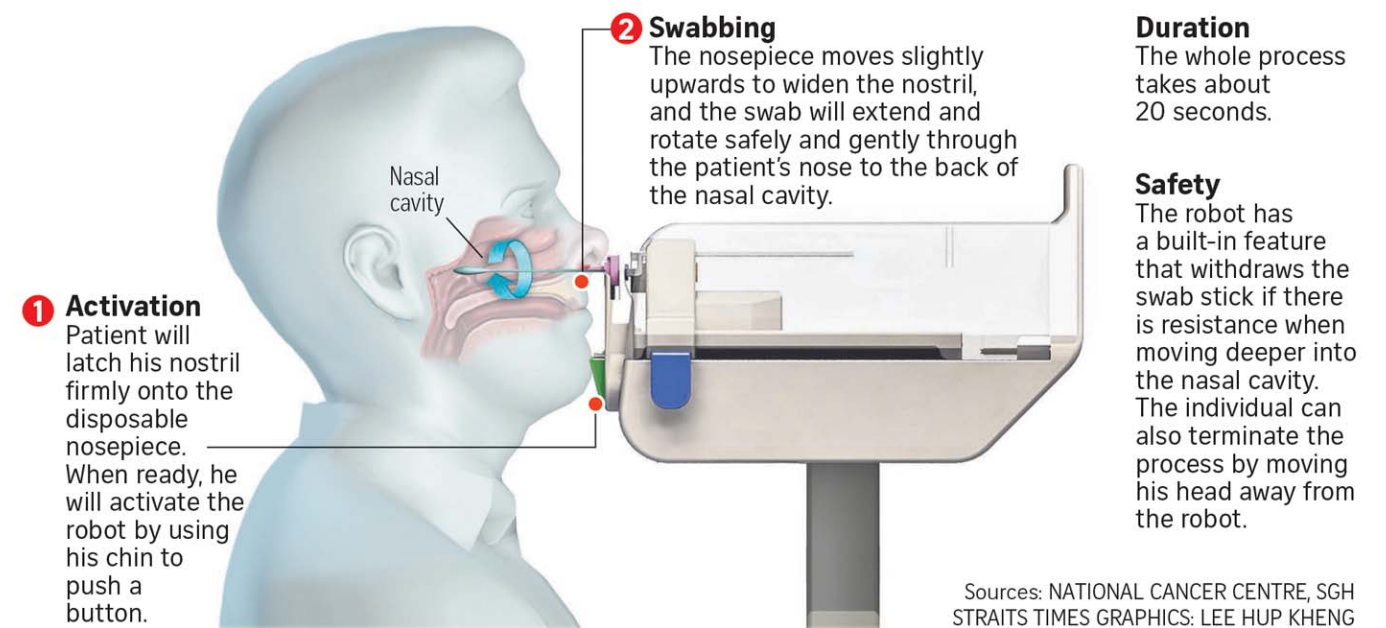
"Our team felt that we had to find a better way to swab patients to reduce the risk of exposure of Covid-19 to our healthcare workers, especially when patients sneeze or cough during the swabbing process," said principal investigator Rena Dharmawan, associate consultant, head and neck surgery, at NCCS and SGH's Division of Surgery and Surgical Oncology.

Beyond that, the clinicians wanted to make the swabbing procedure more comfortable for patients.

SwabBot retains the same gentle touch and precision as surgeons who perform very delicate procedures, said Dr Luke Tay, consultant

## First patient-controlled nasal swab robot

Clinicians and patients who have used SwabBot say that the machine is safe, faster and more comfortable compared with a manual swab test.



at SGH's Department of Vascular Surgery, who is one of the project's team members.

Dr Dharmawan said: "When patients are empowered and fully in control of the swabbing process, they are mentally prepared and experience subjectively less pain."

To date, a total of 85 patients from SGH and Bright Vision Hospital as well as volunteers have participated in the ongoing clinical trial that compares SwabBot against manual swabbing. All of the participants said the procedure with the robot was either equally or less painful compared

with getting a manual swab, said Dr Dharmawan.

Volunteer Marco Lizwan, 25, a second-year medical student at Duke-NUS Medical School, said he was less worried when he was swabbed by the robot.

"I found the robot more comfortable because you can (turn it on) whenever you are ready. So things are within your control. I was worried when I did the manual one because I was wondering if the swabber's hand will be shaky."

SingHealth and Biobot Surgical have filed a patent for SwabBot's technology. Biobot is also working

to get the robot CE-marked for it to be commercialised globally.

Two months ago, a Taiwanese medtech firm developed a robotic arm that can conduct nasal swabs by using a depth-sensing camera. A start-up in Denmark also recently invented a fully automated throat swab robot.

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