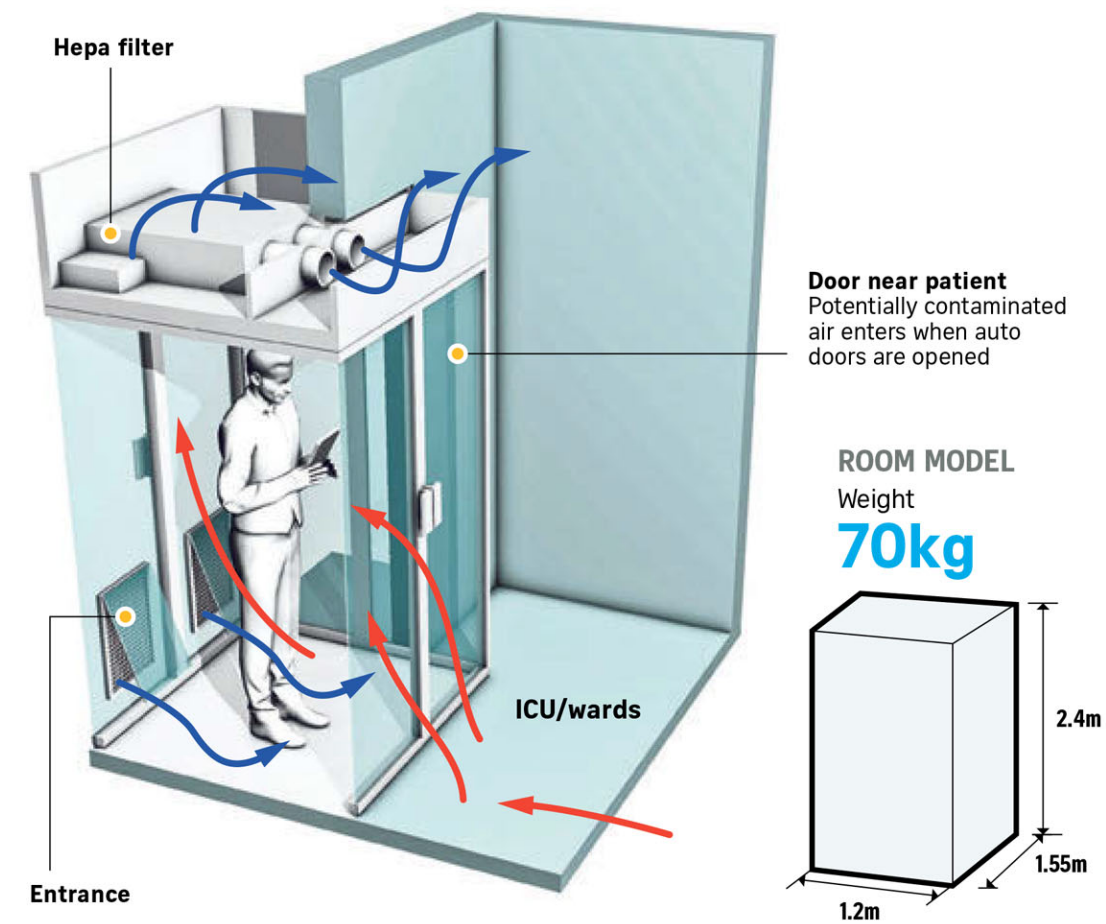


# Quick conversion

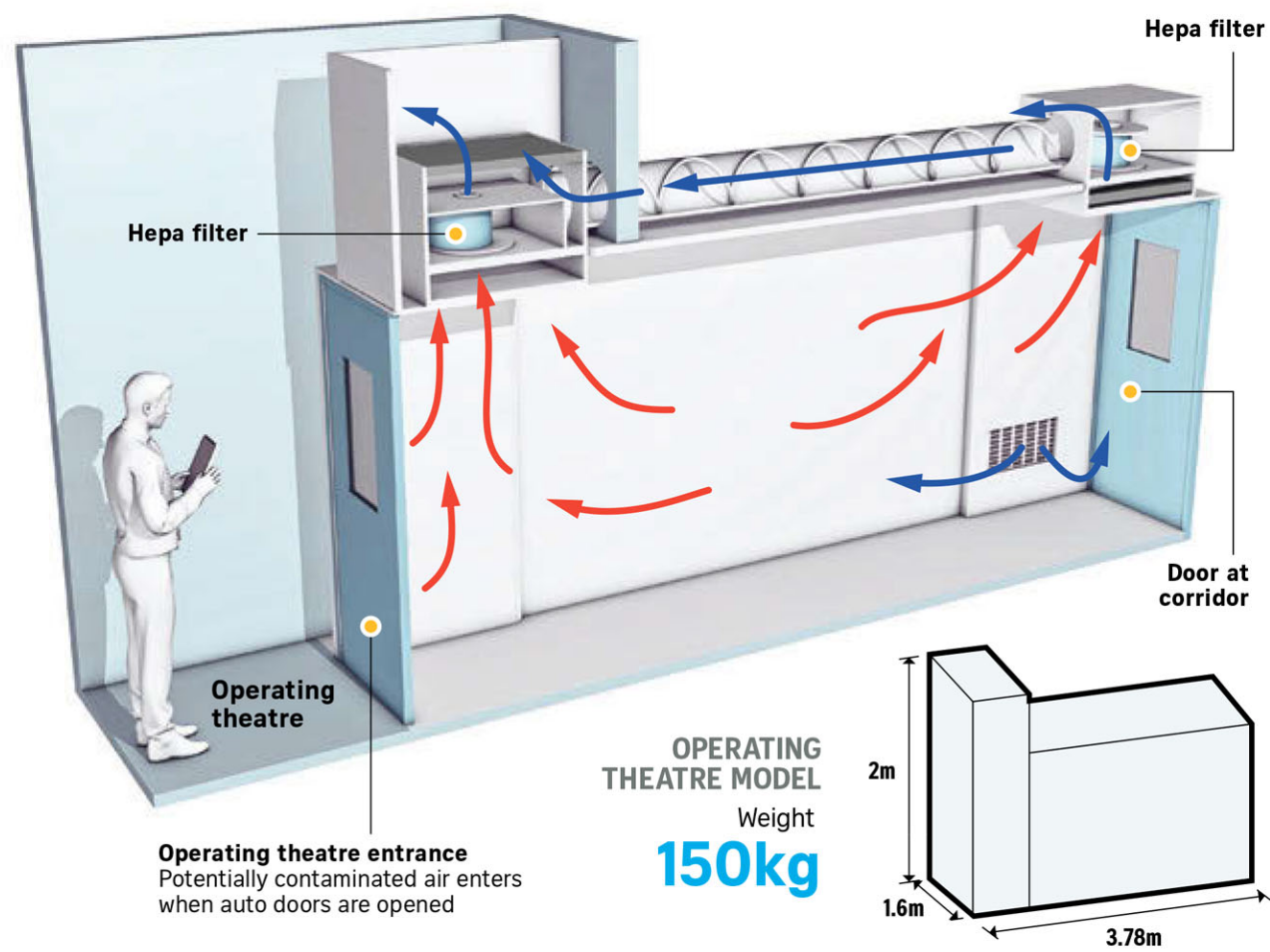
These portable negative pressure systems can convert wards, ICUs and operating theatres into isolation rooms within two hours for infectious patients. The systems ensure that contaminated air does not escape outside the rooms.

➔ Potentially contaminated air   ➔ Hepa-filtered air

## SYSTEM OF PORTABLE ANTEROOM FOR CONTAINMENT (SG-SPARC) FOR ICUs/WARDS



## SG-SPARC FOR OPERATING THEATRE



Source: SGH STRAITS TIMES GRAPHICS: LEE HUP KHENG, LIM KAILI, TANG WEE CHEOW

generating procedures, are performed on infectious patients.

The 150kg chamber takes two hours to set up. One system has been installed in an operating theatre in SGH.

The two systems were developed by anaesthesiologists from SGH, in collaboration with local biomedical incubator The Biofactory. The project was funded by SingHealth Duke-NUS' Urgent Covid-19 Research Fund, with contribution from The Biofactory.

Compared with existing systems, SG-Sparc has a combination of advanced features such as contactless sensors and a higher rate of air filtration, which makes it the first of its kind, said Dr Mavis Teo, a consultant at SGH's department of anaesthesiology.

In a room fitted with the system, the air can be filtered up to 300 times an hour, compared with an operating theatre where the air is filtered 12 times an hour.

The inventions come at a time when existing numbers of isolation rooms abroad are insufficient to support the Covid-19 surge. It is also costly and time-consuming to build isolation rooms.

An SG-Sparc system costs half as much as renovating an ICU room to turn it into an isolation room, said Mr Gabriel Tan, The Biofactory's programme director.

Said Dr Teo, who is the project's co-investigator: "We have seen how hospitals in Italy, in the UK and US – all quite well-developed countries – struggled when they ran out of negative pressure isolation rooms during the Covid-19 pandemic."

"It got us thinking if there is a way for us to very quickly and temporarily convert existing patient rooms, especially ICU rooms, to care for infectious patients when the need arises," she added.

Mr Tan said SG-Sparc has received strong interest from local and overseas hospitals.

nshab@sph.com.sg

# SGH can turn wards, ICUs into isolation rooms within hours

**Shabana Begum**

The Singapore General Hospital (SGH) has created portable systems that can convert wards, intensive care units (ICU) and operating

theatres into negative pressure isolation rooms within hours to house patients with infectious diseases.

One of the two transparent chamber-like systems at SGH, called the System of Portable Anteroom for Containment (SG-Sparc),

can be fitted behind the entrance of a ward or ICU. It measures 1.2m by 1.6m, and is 2.4m high.

After any gaps between the entrance and the system are sealed, a Hepa filter unit at the top of the system is powered up to create a negative

pressure environment within the patient's room, so that contaminated air from the room will not escape.

The chamber has two doors, one at the entrance of the ward and one inside the ward.

When the inside door opens, contaminated air flows into the chamber and through the Hepa filter, and clean air re-enters the room.

The 70kg system takes an hour to set up and was installed at SGH's Medical ICU in July.

The collapsible SG-Sparc can also be fixed to single- and multiple-bed wards.

The other SG-Sparc system, used in operating theatres, is larger to allow an ICU bed, ventilator and medical staff to pass through. Measuring 3.8m by 1.6m and with a height of 2m, the system prevents droplets from escaping the room while surgical operations, including aerosol-

**SCAN TO WATCH**  
SGH chamber innovation:  
The hospital's portable system can convert wards into isolation rooms.  
<https://str.sg/sgh1>