Combating Covid-19: A birth of innovations

The pandemic has given rise to a slew of local inventions that optimise treatment, raise healthcare efficiency and prepare for future infectious disease risks. Shabana Begum highlights some of them.

Self-reliance with 3D-printed face shields

Developed by: Tan Tock Seng Hospital (TTSH) and the National Centre for Infectious Diseases (NCID)

- Goggles can be uncomfortable for healthcare workers and tend to fog up.
- To make protective gear more comfortable, both hospitals conceptualised and invented their own face shields using 3D printing.
- One was a disposable face shield, and the other had a spectacle frame.
- With minimum contact with skin, users are more comfortable. They do not need to wear goggles under the face shields.
- The locally produced face shields also reduce reliance on overseas suppliers, who may face shortage or import disruptions.
- The face shields are currently used in some departments within TTSH and NCID, which includes the NCID Screening Centre, emergency department and pandemic wards.

UV light box disinfects medical supplies

Developed by: Yishun Health and Republic Polytechnic

- The ultraviolet-C (UVC) light inside the box can disinfect and probing the use of items such as stethoscopes, goggles, face shields and even surgical masks.
- UVC light kills around 99 per cent of bacteria and has been clinically proven to eliminate viruses.
- Most items are first cleaned with alcohol wipes before they go into the disinfecting box for three minutes.
- Once disinfected, the surgical masks and other protective gear can be reused throughout the whole work shift.
- The boxes were distributed to wards and departments across Khoo Teck Puat Hospital and Yishun Community Hospital.

Tele-audiology

Pioneered by: Ng Teng Fong General Hospital (NTFGH)

- Telemedicine has been thriving this year as more patients are opting for medical check-ups and rehabilitation from home.
- But tele-audiology - where specialists help patients virtually with hearing loss management, such as by adjusting their hearing aids - is a new entrant to tele-health in Singapore.
- NTFGH’s audiology department is believed to be the first to offer this service here.
- Through video consultation, audiologists can help patients with hearing difficulties or impairment use their hearing aids and optimise their residual hearing abilities.

Robots to the rescue

- Sengkang General Hospital is exploring the use of autonomous mobile robots in wards. The robots can deliver services and items inside the wards to assist the nursing and support staff.
- Confirmed and suspected Covid-19 patients at Alexandra Hospital receive their meals and medicine from a robot called BeamPro.
- From next month, a concierge and security robot will scan SafeEntry check-ins and record visitors’ and patients’ temperatures in NTFGH.
- SwabBot, which automates nasal swabbing to diagnose Covid-19, was developed by the National Cancer Centre Singapore, the Singapore General Hospital, Duke-NUS Medical School and Biobot Surgical.

A stroke patient at CGH undergoes rehabilitative therapy using the robotic device, Andago.

Robot assistant for post-critical Covid-19 patients

Used in: Changi General Hospital (CGH)

- Covid-19 patients who are on mechanical ventilation in the intensive care unit (ICU) for a prolonged time may need pulmonary rehabilitation right after, because of muscle weakness and breathing difficulties.
- A patient is harnessed to a robotic support system, called Andago, which bears part of the patient’s weight as he tries to walk and strengthen his muscles without the fear of falling.
- Earlier this year, a recovered Covid-19 patient who was under mechanical ventilation for 15 days in the ICU used Andago during his in-patient rehabilitation.

- Initially, the 61-year-old was easily fatigued and could walk only 4m with assistance from therapists before his oxygen level dropped.
- After switching to the robotic device, he managed to walk 368m without any oxygen support or rest, after six sessions over 13 days.
- Andago was first introduced in CGH for stroke patients.

Source: The Straits Times © Singapore Press Holdings Ltd. Permission required for reproduction