

3D printing shortens wait for foot braces at Tan Tock Seng Hospital

Patients can now get one in just 1-4 weeks, from up to 12 previously; they also fit better

Rei Kurohi

The introduction of 3D scanning and printing technology at the Tan Tock Seng Hospital (TTSH) Foot Care and Limb Design Centre has cut waiting times for patients who require customised ankle-foot orthotic braces.

They can now receive one in just one to four weeks, compared with a wait of up to 12 weeks previously.

Mr Khalid Anuar, who heads the centre, said the conventional method that has been used for decades is laborious.

"The process involves creating a

cast of the patient's leg out of plaster of paris. The cast is then used to make a model of the patient's leg. Technicians then heat sheets of plastics and shape them over the model by hand," he said.

Noting the rising popularity of three-dimensional technology, Mr Khalid and his team of prosthetists and orthotists at the centre started exploring in 2016 how it could be used to improve their services.

The new method involves using handheld scanners to create a digital model of a patient's limb.

A brace is then designed and adjusted using 3D software based on the scan of the patient's limb.

Once the design is finalised, the file is sent to local 3D-printing company Forefront Additive Manufacturing, which prints the brace using a type of plastic called nylon 12.

The thickness of the 3D-printed material can also be varied to balance flexibility, durability and strength, which was not possible using the old method, said Mr Khalid.

Besides a shorter wait, the main advantage of 3D-printed braces is that they fit better and are more comfortable for patients, he said.

Mr Khalid added: "If they don't find it comfortable, they will not want to wear it and that defeats the purpose. They may also develop other secondary problems such as

knee pain and back pain as a result of poor walking pattern."

After several rounds of trials, the first such device was given to a patient at the centre early last year.

For their efforts, the team won a Best Practice Medal at the National Healthcare Innovation and Productivity Awards 2019 organised by the Ministry of Health earlier this month.

One patient who benefited from the new process is Ms Wee Tin Fang, 79, who received her device last month after a four-week wait.

Following a stroke in 2014, Ms Wee found that the sole of her left foot slowly began to turn inwards, which made it difficult for her to walk properly.

Mr Tsurayuki Murakami, a senior prosthetist and orthotist at the centre, said: "The effects of this condition can worsen over time if it is not controlled, and can lead to muscle tightening.

"An orthotic brace can correct the alignment of the foot and prevent the symptoms from worsening."

In 2016, Ms Wee decided to get an off-the-shelf orthotic device, but it was a poor fit and caused blis-

ters and bruising.

She stopped using it after less than a year and her condition deteriorated.

In March this year, Ms Wee's younger sister suggested that she get one custom-made after meeting a neighbour who was using such a device from TTSH's centre.

"I'm happy that I can now walk by myself," said Ms Wee, who lives with her sister.

Ms Wee said the device cost her about \$100 after subsidies, about the same as what she would have paid for one made using the conventional method. The price before subsidy is about \$700.

Mr Khalid said that the 3D scanning and printing techniques can also be used to make other devices, such as supportive back braces for patients with scoliosis and prosthetic limbs for those who have undergone amputation.

He added: "Digitisation also opens up the possibility of collaborating with experts or institutions overseas as it's easy to share the files online."

rei@sph.com.sg

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Smoking cabin brings one-north a breath of fresh air

Kristelynn Lim

A cabin that converts cigarette smoke into clean air, the first in Singapore, has been installed outside Fusionopolis in one-north, in Buona Vista.

The air-conditioned Smoking Cabin SG, which was launched yesterday, is aimed at tackling the issue of second-hand cigarette smoke in Singapore.

The cabin was developed by Mr Stefen Choo, director of Southern Globe, a sales and logistics firm specialising in spare parts for aircraft.

Said Mr Choo, 40: "I am a father of two, and there are many occasions when my family has been inconvenienced by the presence of cigarette smoke. I have always felt that there should be a better solution to contain cigarette smoke in Singapore."

The cabin can fit up to 10 people at a time and utilises a three-layer filtration system.

A prototype was placed outside Fusionopolis for 10 days earlier this month, and an average of 100 smokers were reported to have used it daily. The smoking cabin will remain in the area for a year.



Singapore's first smoking cabin, which converts cigarette smoke into clean air, outside Fusionopolis in one-north, in Buona Vista. The cabin can fit up to 10 people at a time and utilises a three-layer filtration system. ST PHOTO: GIN TAY

"We plan to launch 60 more of these cabins all around Singapore and a further 60 next year," said Mr Choo.

One cabin costs about \$20,000, and Southern Globe said it is currently in talks with building owners and shopping malls to provide second-hand-smoke-free places to their patrons and tenants.

Mr Drake Lim, 36, director of multimedia design company Design Jukebox, was among the first few who used the smoking cabin.

He said: "I know second-hand smoke is harmful to others, so I think this is a very good addition to what we can do to help the environment."

Mr Aaron Tham, director of new estates at JTC Corporation – the master planner and developer of one-north – said the area served as a "living lab" where entrepreneurs, technology companies and research institutions could test-bed their urban solutions.

"The smoking cabin at Fusionopolis Plaza is one such smart solution that also provides a nicer and cleaner environment for the one-north community," he added.

The National Environment Agency (NEA) said that the installa-

tion of smoking cabins is not prohibited, as long as they are not placed at locations where smoking is banned.

NEA currently has no plans to launch similar cabins, the installation of which, it said, required careful consideration.

lkris@sph.com.sg

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