



Lim.

Existing methods of detecting plaque in blood vessels such as computerised tomography scans and magnetic resonance imaging would require expensive and bulky equipment. Such tests need to be done in hospitals by trained medical professionals.

As plaque will change the stiffness of the blood vessel and hence the pulse waveform, the novel sensor developed by the NUS engineering team could be easily used to detect plaque before it accumulates to a size big enough to block or rupture the blood vessel.

Earlier this year, the NUS team published the development of the microfiber sensor and its application for pulse monitoring in scientific journals *Proceedings of the National Academy of Sciences (PNAS)* and *Advanced Materials Technologies*, respectively.

Another clinical application of the smart microfiber sensor is for the management of venous ulcers, which are caused by poor blood circulation. They occur when the veins in the legs could not push blood back to the heart as well as they should. As blood pools in the veins, there is increased pressure in the veins, causing progressive skin damage over time.

Being ultra-thin and highly flexible, the NUS engineering team's microfiber sensor can be easily woven into bandages to monitor the pressure that is being delivered and maintained. This could potentially improve the effectiveness of the treatment and reduce the time required for healing.

In future, patients could also track the bandage pressure using an app, and the information could be shared with doctors who could remotely monitor the progress of the treatment.

The team is currently collaborating with the Singapore General Hospital to test the application of the microfiber sensor for bandage pressure monitoring.

"Our microfiber sensor is highly versatile, and could potentially be used for a wide range of applications, including healthcare monitoring, smart medical prosthetic devices and artificial skins. Uniquely designed to be durable and washable, our novel invention is highly attractive for promising applications in the emerging field of wearable electronics," said Prof Lim.

The team has filed a patent for its smart microfiber sensor. Researchers are currently refining the sensor design and reducing the size of its accessories to improve the user-friendliness of the device. The NUS team had recently won the Most Innovative Award at the Engineering Medical Innovation Global Competition held in Taipei in September 2017.

While the NUS researchers continue to explore new applications of the microfiber sensor, they are also keen to work with commercial partners to bring their novel sensor to market.