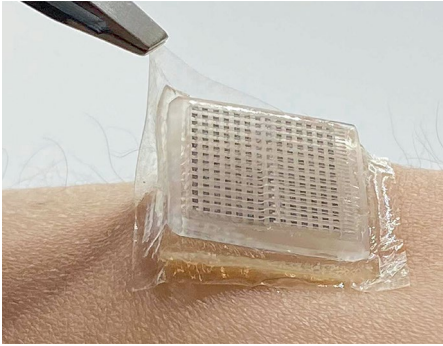


## WEARABLE DEVICES

**Ultrasound on the go***Science* **377**, 517–523 (2022)

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Wearable devices, such as smartwatches, can be used to continuously monitor physiological data and have a potential role to play in the development of personalized healthcare. Studies have, for instance, shown that data from consumer smartwatches can help in the early detection of COVID-19. Devices that can be conformably attached to the skin could extend the capabilities of current consumer devices. Such next-generation systems are often used to record signals from the skin — to analyse

sweat or record electrocardiograms, for example — but their use in the imaging of internal tissues and organs is more limited. Xuanhe Zhao and colleagues have now developed a wearable ultrasound imaging device that can continuously monitor different organs in the body.

The researchers — who are based at the Massachusetts Institute of Technology and the Mayo Clinic in Rochester — use a thin but rigid ultrasound probe that consists of an array of piezoelectric elements. Each of these elements is controlled by circuits placed above and below the array (with the top circuit covered by an acoustic backing layer and the bottom circuit covered with an acoustic matching layer). The probe is then adhered to the skin with the help of a soft but tough hydrogel, which is encapsulated by a thin elastomer membrane and then coated with a thin bioadhesive layer. The researchers show that the device can be worn on the skin for over 48 hours and can image blood vessels, lungs, the heart and stomach.

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