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Sticker reveals soldiers' bomb blast exposure

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A colour-changing crystal device worn on a soldier's uniform could reveal the intensity of bomb blasts they have been exposed to, helping doctors to treat brain injuries that are too subtle to be detected by brain scans.

Soldiers in the Iraq war frequently suffer from blast-related traumatic brain injury following exposure to shock waves emanating from improvised explosive devices. Much of the damage sustained from such blasts cannot be detected from an MRI scan, but can still have clinical consequences. If doctors can get a measure of the intensity of the blast, it will help them gauge the severity of the brain injury and treat the patient appropriately.

Researchers at the University of Pennsylvania in Philadelphia have developed a device based on a photonic crystalline material. The crystal's colour is determined by its structure, so when a shock wave from a blast hits the crystal, changing the structure, its colour will change too.

"Depending on the damage, you'll have different colour intensities," says Shu Yang, one of the researchers who developed the device. "Based on that information we can extract how much force the soldier has received."

The device consists of a thin film that can be attached to the soldier's clothing or helmet, like a small coloured sticker.

The team's next step will be to develop a method to quantify the colour changes and translate this into a measure of neurological damage. They presented their device at a neurotrauma meeting in Orlando, Florida, last week.

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