

New bandages could help to treat diabetic and burn wounds

15 June 2020



Researchers have developed two types of dressings that could help the formation of blood vessels - a crucial part of the healing process for wounds. The cotton wax dressing is pictured. Credit: University of Sheffield

New dressings that could be used to treat diabetic wounds and burns injuries more effectively have been developed by engineers from the University of Sheffield

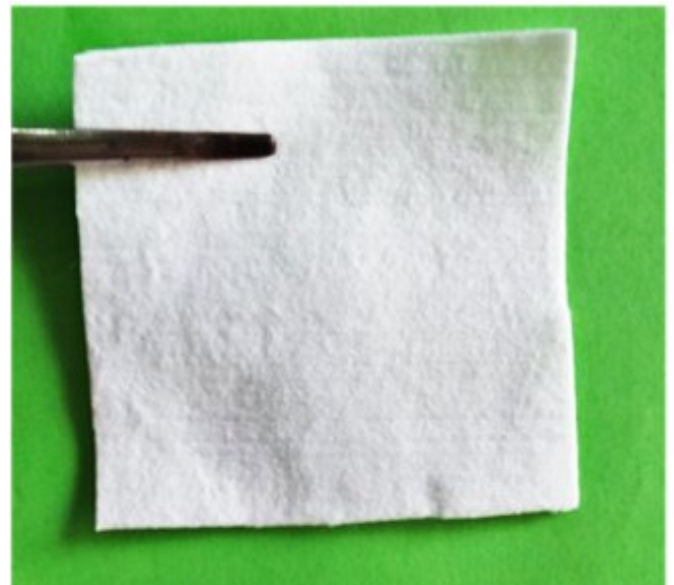
The cotton-based dressings, developed by Professor Sheila MacNeil from the University's Department of Materials Science and Engineering, release an agent that promotes the formation of new blood vessels—a crucial part of the healing process.

Developed as a collaboration with researchers in Pakistan, the new bandages could also be more affordable and accessible for patients in developing countries where there is an urgent need for dressings to treat chronic [wounds](#) caused by diabetes, as well as burns injuries.

With a population of more than 200 million and a struggling economy, affordable healthcare is a major challenge for Pakistan. In developing countries like Pakistan, surgeons and patients do not have access to advanced wound care dressings due to their high price.

Following discussions with surgeons in hospitals and burns units in Pakistan, the research team found that a safe and effective dressing, which can accelerate wound healing, and which does not stick to the wound and acts as a barrier layer to prevent infection from external pathogens, is urgently needed.

There are more than 5.2 million people with diabetes in Pakistan and over 422 million [diabetic patients](#) around the world. For patients with diabetes, around 15 percent will develop diabetic ulcers on their feet or lower legs.



After speaking to surgeons, the researchers found that a safe and effective dressing to treat patients with diabetic ulcers and burns injuries in developing countries is urgently needed. The non-woven cotton dressing is

pictured. Credit: University of Sheffield

Diabetic ulcers are very difficult to heal and a failure to heal can often progress to amputation. Diabetic wounds are also the leading cause of amputations in the United States.

There are 147 burn injury patients per 100,000 emergency visits in Pakistan. For patients with superficial or partial burns, the challenge is to achieve rapid wound healing to avoid problems of sepsis, scarring and contraction.

Angiogenesis—the formation of new blood vessels—is an important stage of the normal wound healing process, but this is impaired in all chronic wounds. In the case of burns injuries, the upper skin layer is damaged which also disrupts the formation of new blood vessels.

The team of researchers has tested two new types of dressings loaded with a pro-angiogenic agent named 2-deoxy-D-ribose (2dDR) that has been reported to promote the formation of new blood vessels. They discovered that both types of dressings—a non-woven cotton dressing and a cotton wax dressing—stimulated blood vessel formation in a fertilized chick egg model.

Professor Sheila MacNeil, Emeritus Professor of Tissue Engineering at the University of Sheffield's Department of Materials Science and Engineering, said: "Chronic wounds can be a huge problem for people with diabetes. Once they develop they can be difficult to treat, even more so for people in developing countries who can't afford to access advanced healthcare. In the worst cases these wounds can lead to amputation.

"The new dressings we are developing are demonstrating the potential to treat these wounds more effectively than the current treatment methods. The non-woven cotton fibres would be ideal for treating [chronic wounds](#) and ulcer wounds because of their good absorption capacity, while the 2dDR containing cotton wax [dressing](#) would be more appropriate for treating burn wounds because of its non-adhesive properties.

"We're now hoping to continue our research in Pakistan and run first in man safety studies before clinical trials to bring the dressings a step closer to being available for patients and healthcare systems."

More information: Anisa Andleeb et al. Developing affordable and accessible pro-angiogenic wound dressings; incorporation of 2-deoxy D-ribose (2dDR) into cotton fibres and wax-coated cotton fibres, *Journal of Tissue Engineering and Regenerative Medicine* (2020). [DOI: 10.1002/term.3072](https://doi.org/10.1002/term.3072)

Provided by University of Sheffield

APA citation: New bandages could help to treat diabetic and burn wounds (2020, June 15) retrieved 14 June 2022 from <https://medicalxpress.com/news/2020-06-bandages-diabetic-wounds.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.