# To promote healing, simply add oxygen

Chronic wounds represent a significant health challenge, particularly in the case of diabetic foot ulcers. But a spray that delivers oxygen to the injury could reduce healing time. Mohammed Al Derwish, head of the Diabetic Foot Clinic, King Abdul Aziz University Hospital, discusses the impact this product from **Mölnlycke** has had on patient outcomes in his clinic.

Type 2 diabetes has been called the fastest-growing health crisis of the present time. The number of people with the condition globally has risen from 108 million in 1980 to 425 million today, and the problem shows no sign of going away anytime soon. In fact, the figure is expected to increase to 642 million people living with the disease worldwide by 2040.

But although the diagnosis is common, the outcome can be serious. Diabetes is a major cause of blindness, heart problems, strokes and lower-limb amputations.

*"We make sure a patient's wound is not infected. We have to make sure that the patient is not ischaemic. We also have to take into account all the different issues there are. We have debridement, cleansing and have to control ischaemia and infection."*

It might be hard to imagine how a disease that affects the way that blood sugar is stored in the body could lead to amputations, but what happens is that the untreated high blood sugar levels ultimately damage nerves (neuropathy). The condition can also lead to narrowing of the blood vessels, causing reduced blood supply and poor circulation to the feet.

A healthy blood supply is needed for skin to heal normally and, with nerve damage, a person is more likely to end up hurting themselves without realising. Together, these factors make foot injuries (and slow-healing ones at that) more likely. Charity Diabetes UK says diabetic foot ulcers cause more than 80% of amputations in the country.

Mohammed Al Derwish sees the havoc the disease can wreak on feet every day in his clinic at King Abdul Aziz University Hospital, in the Kingdom of Saudi Arabia. Derwish, who is head of the Diabetic Foot Clinic there, has treated some of the most severe chronic wounds imaginable in his 25 years as a specialist. It is Derwish's mission to heal the damage caused by diabetes and save his patients from amputation. Derwish knows the emotional burden a chronic wound can have on a person and does not think it should be underestimated.

"I'm seeing 35–50 patients a day, and I work five days a week. With some of these patients, you can see wounds up to the bone and some are infected or ischaemic. I frequently see gangrene too," he reveals.

The average patient who comes to see Derwish usually has been tolerating their wound for roughly 45 weeks, but he also sees people who have been suffering in silence for much longer than that – in some cases around seven years.

Wound care is a particularly challenging area of medical practice, Derwish explains. For the wound to heal successfully, a complex molecular process must occur. The process is generally divided into four stages: blood clotting, inflammation, tissue growth and tissue remodelling. However, many factors can interrupt this activity, such as type 2 diabetes, blood vessel disorders, infection and ageing.

To ensure the best outcome for the patient, Derwish and his team first conduct debridement of the wound (where the damaged tissue is removed), followed by a strict cleaning process. After this, the wound is covered with specific dressings to encourage healing.

"We make sure a patient's wound is not infected. We also have to take into account all the different issues there are. We have debridement, cleansing and have to control ischaemia and infection," explains Derwish.

## Red blood cell inspiration

Derwish reveals that, while there has been a lot of development in dressings in recent years, he has not really seen much innovation in other wound care products. However, he has had success with one potential solution that is not a dressing, but a spray you put on before placing the dressing on the wound. The spray claims to promote the healing process of wounds.

"I am a decision-maker, and we are always looking for what's new and good. This spray was a product that nobody was talking about. But we tried it and found it was very useful. It's surprising because I have more than 20 types of dressings I've been waiting to try, but I'm not interested in them. But with this, I started to use the product straight away because I was interested in oxygenation helping the wound healing. It's a unique area," he explains.

Granulox hit the German market in 2012, and was shortly introduced globally. It's an oxygenating spray specifically formulated for chronic wounds, including those caused by diabetes. It even works for particularly sloughy or infected wounds.

The spray is marketed by Mölnlycke, a company founded near Gothenburg in 1849, which started as a textile manufacturer supplying gauze to Swedish hospitals. Besides Granulox, the company also offers other wound care products, such as silicon-based dressings that help to reduce pain for patients.

Granulox has an interesting mechanism of action. It works on the principle that for successful healing to occur, you need oxygen. Modelled on the haemoglobin molecule – the way oxygen is transported around the body in red blood cells – the spray binds with the oxygen in the environment and enhances its diffusion in the wound bed. In 2016, Hunt el al reported that this topical oxygen supply resulted in 50% shorter time to heal diabetic foot ulcers than with standard care.

Derwish applies it whenever he changes a patient's wound dressing, usually every few days. He was a little sceptical about it at first, but decided to try the spray on a particularly challenging patient – a person with a large foot wound that had been increasing for seven years and was severely impacting the quality of life.


Granulox works on the principle that oxygen is required for successful healing to occur.

"It was a chronic, unhealable wound. So I started using this spray with this patient and after a week I start to see a response. It's been a really good outcome. The patient had this wound for seven years, but it's already closing up. The product has really helped me to bring about fast healing," he says.

*"Researchers suggested that the spray would be a good addition to standard wound care as it supports wound closure, wound size reduction, improvement in pain, sloughing and exudate levels."*

## A simple addition

Faster healing is obviously great for the patient, but it's better for the hospital too, as it means shorter patient stays and reduced treatment costs. Derwish explains that what he particularly likes about Granulox is that it's so easy to use.

He hasn't had to implement an entirely new process to include it. He and his team can work exactly as they did before with just a short additional step.

"I haven't had to change the types of dressing I'm using. It's really good because it didn't take a long time to understand the product because it is not changing the way we work. I started using it because I thought it could be promising and now I know it's a good product."

## Change of pace

It's not just Derwish's patients who have seen better outcomes with Granulox added to the regimen. Clinical studies suggest the product really does promote healing, even in particularly tricky patient cases. Research conducted at the Wellway Medical Group in Northumberland, UK, with chronic diabetic foot ulcer patients observed nearly twice the average wound size reduction after four weeks of using the haemoglobin spray, compared to those whose treatment was standard care.

The spray was also associated with markedly reduced exudate levels – fluid that may present a significant challenge during the wound-healing process. The researchers suggested that the spray would be a good addition to standard wound care as it supports wound closure, wound size reduction, improvement in pain, sloughing and exudate levels.

Derwish says his patients are generally very enthusiastic about the spray once they see their healing accelerated. As a medical professional, he says that Granulox has also made him feel more secure in his job, because he knows it will help him do his best for the patient.

"I have recommended the product to my colleagues in other hospitals. I tell them they have to try it because it will give them better patient outcomes. I will try anything that can increase my healing rate," he says. "Granulox has made me more confident. I'm now less worried about difficult cases and amputation." ●

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