

Combating decubitus

6 They are agonising for people confined to their beds for a long time: bedsores. But there is hope. In the European research project 'Lidwine' – the patron saint of the chronically ill – ten European SMEs and seven universities are investigating possible solutions to prevent these sores or more quickly heal them. TNO is supervising the project. Fourteen manufacturable product concepts have already been identified for infection-inhibiting dressings, low-friction bedding and textiles that stimulate blood circulation.

Bedsores can occur due to an insufficient flow of blood and cell stress as the result of permanent pressure on the flesh. These sores tend to be large and painful, and in many cases they become infected.

TNO project leader Dr Herman Lenting sketches the size of the problem. 'A study reveals that in the United States alone a million people suffer from decubitus. In Europe, too, this causes both suffering and financial cost. A conservative estimate is fifteen billion euros due solely to hospitalisation caused by decubitus.' Reason for TNO to take the initiative for a European 'call for proposals' to research medical textiles geared to the problem of bedsores.

CONTROLLED DELIVERY

'With assistance from SenterNovem EG Liaison, we set up an international consortium to look at a range of possible solutions. We have been going for two and a half years,' says Lenting. 'A key SME partner for the manufacture of dressings is the Dutch representative of the Austro-German company, Lohman & Rauscher.'

A whole range of disciplines comes together in Lidwine, including medical knowledge and know-how of textiles, polymers and nanotechnology. TNO is contributing its knowledge of the controlled delivery of antimicrobial agents from the dressing. 'We are working with the Portuguese University of Minho on this. Sore fluids or the presence of certain enzymes provide a signal to the smart system to start delivering antibacterial agents and nip the infection in the bud.'

The focus is not just on healing but also on prevention, an aspect in which bedding can play a role. Applying a coating with a thin layer of polymers generates much less friction than normal. This is also an area in which TNO lends its knowledge.

A second, equally prevention-geared, solution is a massage dressing that uses new, integrated polymers. These can be prompted to contract and 'massage' sensitive parts of the body, thus alleviating the permanent pressure and stimulating blood flow.

COMMON FOCUS

The research fundamentals have been laid and the focus is now product development. 'The developments are highly promising in all three areas,' Lenting says. 'A broad, multidisciplinary approach like this can generate surprising solutions. From an ultrasound method for developing nanoparticles of metal oxides with an antimicrobial effect to biotechnological

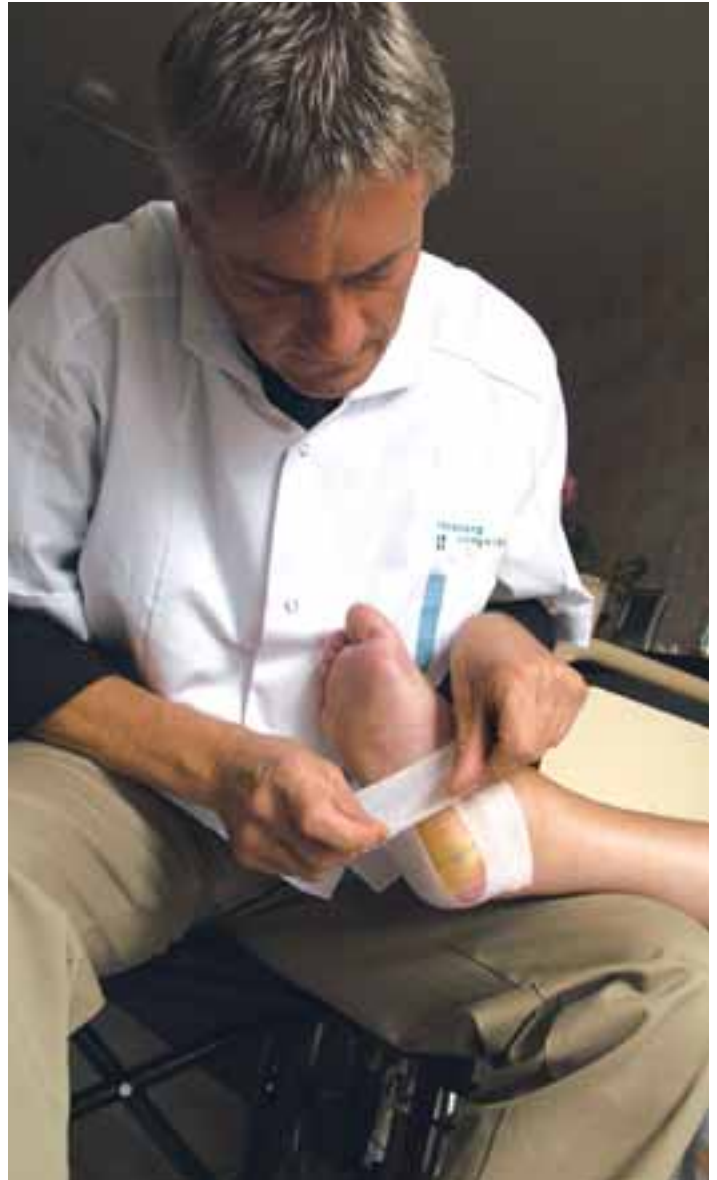


Photo: Frank Müller / HH

research into the workings of enzymes. It is not always easy to fully comprehend the fine points of each other's field, but that's not really necessary. The differences can be bridged by a common focus on the ultimate goal: to develop products that help reduce this growing medical problem. And that is heading in the right direction. We have already begun bilateral sequel projects on tangible product development.'

Info: herman.lenting@tno.nl