

## Tomorrow's nursing bed is intelligent



Mobility Monitor for bedridden patients: Michael Sauter, founder and CEO of Empa/ETH Zurich spin-off compliant concept.

The Mobility Monitor provides nursing home and hospital personnel with an objective measure of how mobile bedridden people are. The electronic nursing assistant from compliant concept – a spin-off of Empa and ETH Zurich – came onto the market in July 2012 and is part of a comprehensive overall concept. It is intended to enable health professionals to plan and design optimum care. An active bed that gently and constantly changes the patient's position will follow in 2013.

Mrs M. is eighty-one years of age, bedridden and particularly suffers at night when she really wants to sleep. The reason for this is that she constantly needs to be moved. By moving her, the nursing staff promote her blood circulation. Unfortunately, this means that Mrs M's nighttime rest is constantly being disturbed. This also creates work for the nursing staff. It is not a nice situation for either party. So what is the answer?

A technical device has recently been promising relief – the so-called Mobility Monitor. A sensor under Mrs M's bed measures the slightest movement and evaluates it. Surprisingly, it transpires that her movement while asleep is usually adequate, namely between two and four times each hour. Occasionally, however, the sensor records no movement over an extended period. This is alarming because if body positions are stressed for too long by being prone, the microcirculation there is disrupted. A painful pressure sore can result – referred to technically as "decubitis". This is to be avoided at all costs. The staff discuss the evaluation with Mrs M, who now consents to being moved into a new position occasionally but only if she is not moving sufficiently of her own accord and the Mobility Monitor summons the staff. Since then her sleep has been less disrupted. The associated conflicts are avoided and the nursing staff's workload is lightened.

#### **A spin-off of Empa and ETH Zurich**

The Mobility Monitor is the first product of a company called compliant concept founded by young entrepreneur Michael Sauter that is a spin-off of Empa and ETH Zurich and still in its infancy. Stories such as these please Sauter, now the company's CEO. "We have always learned the most from real life situations," he says. During his degree course at the Institute of Mechanical Systems at ETH Zurich, the young mechanical engineer would never have dreamt of being involved with care issues. In the "Compliant Systems" sub field, he applied himself to especially strong ice hockey sticks and car seats capable of adapting to the individual and driving situation. And suddenly, as Sauter recalls, it struck him that "this should also be possible with beds..." The idea did not leave him alone, even after he began to work at Empa after finishing his doctoral thesis in 2009.

It might have remained just an idea if Sauter had not taken part in the "Venture Challenge" course supported by the Commission for Technology and Innovation (CTI) in which university graduates learn how to develop business ideas from innovative technologies. There it dawned on him that an "intelligent" adaptive bed would be enormously helpful to bedridden people and healthcare staff. A new kind of jointless slatted frame made of intelligent materials and integrated sensors and a modified mattress imitate the movements of a healthy individual, gently and continuously changing his or her position and thereby preventing the dreaded decubitus ulcers.

This was technically feasible, but required specialists to clarify the medical background and market situation. Sauter systematically familiarised himself with the decubitus problem and even successfully completed a work placement at a healthcare facility. There he experienced just how great the workload is for the individual carers and the pressure put on all to make savings. "I was now certain," says Sauter, "that intelligent solutions were called for. Their purpose would be to relieve pressure on staff while ensuring that patients received the very best care."

In May 2009 Sauter founded his own company. The Empa and ETH Zurich spin-off established itself on the Empa campus in Dübendorf in the glaTec technology centre. "In Switzerland the conditions are optimal; the support is excellent," says Sauter. "But it's also important to make use of what's on offer," he continues. He therefore sought advice from glaTec and CTI experts on matters relating to contracts, the business model, marketing and finance. glaTec Managing Director Mario Jenni vouches for Sauter's sound instincts for what the market wants.

#### **Positive feedback from initial customers**

Over the years Sauter forged collaborative relationships with numerous partners and was able to conduct the first practical tests of the new solutions at the Swiss Paraplegic Centre Nottwil and the Bürgerspital St. Gallen care home and residence for the elderly. The young company's progress did not go unnoticed. Sauter and his team walked off with several young entrepreneurship prizes, receiving the "CTI Medtech Award 2010" for example, and were honoured with the "Venture Idea 2010".

The many meetings with people from the nursing sector and feedback from numerous tests in nursing homes and infirmaries prompted Sauter to launch the Mobility Monitor system in July 2012. He was convinced that the use of this device alone, which can be affixed to any bed, made sense. Care professionals told him they used the monitor to record sleeping behaviour or to check that the correct dose of medication was being administered.

"The feedback from the many initial customers is extremely positive and completely overwhelmed us," says Sauter. In the first quarter after sales began, his company, which now employs ten people, had already achieved over 50 per cent more revenue than that envisaged by the business plan. Some customers had already purchased additional units and a well-known Swiss nursing home group was equipping its homes for the elderly with the Mobility Monitor. Demand from abroad was also increasing. Next year, the Mobility Monitor will be on sale in Germany; a distributor has already been found. And the contract with a Scandinavian bed manufacturer that will in future be selling the active bed has already been signed. The launch is scheduled for the end of 2013. Nothing further now stands in the way of tomorrow's intelligent bed.