



## Power Vest for Patient Caregivers



Researchers at the Fraunhofer Institute for Production Systems and Design Technology IPK and the Fraunhofer Institute for Reliability and Microintegration IZM, are developing a vest that is designed to take the burden off caregivers and others with physically demanding jobs. This could be really good news for the millions of people in the EU who injure themselves in the course of their work and end up with serious health issues.

According to a report published by the Techniker Krankenkasse, back pain is a national complaint in Germany and nearly ten percent of all lost working days are attributable to lower back problems. The study found that occupation had a significant impact on both the duration and frequency of time taken off due to health issues. Caregivers are particularly affected as reported by the study, mainly because working in a hospital or a nursing home requires physical strength. Caregivers are often required to move patients, mobilise and help them up and other similar tasks that can often put their musculoskeletal system under stress.

The "CareJack" project developed by Fraunhofer is working towards developing an active vest that is designed for these kinds of workers. It is a non-bulky orthosis. It is light, soft and comfortable to wear and can be worn over regular clothes like a coat. Experts are calling it soft robotics.

The head of the project Henning Schmidt believes that there is currently no efficient system that would help caregivers with the heavy work they often encounter in their day to day work. People who work in hospitals, nursing homes or outpatient care not only need a strong back but also some support for their spine that would not limit its range of motion. Based on this premise, Schmidt and his team have joined forces with partners who have developed this vest that is flexible, comfortable and has all the electronics incorporated into the material.

The vest generates energy from the wearers themselves, through their movement. For example, if a caregiver bends down to lift a patient up, the vest will store the kinetic energy and will release it again when required. The smart vest features a myriad of sensors that continuously monitor the way the wearer is moving. A processor compares these data against the optimum movement pattern and a warning lamp is activated as soon as it detects any irregularity. Not only that, but innovative synthetic actuators with adjustable rigidity help avoid incorrect movements and support correct ones. "The wearer can decide themselves what level of support they want," says Schmidt.

It is expected that a prototype of the vest will appear in 2015 and production will begin in one to two years. Schmidt is confident that the demand for this sort of active support would be extremely high as it will be useful for anyone performing heavy physical work including caregivers, construction workers, roofers, garbage collectors and many more.

Source: Fraunhofer-Gesellschaft

Image Credit: Fraunhofer-Gesellschaft

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