The future of nursing care: smart mattresses and speech-to-text tablets

Robots that comb your hair – or even give you a wash? Thanks, but no thanks. That's not what tomorrow's nursing care should look like. The Fraunhofer Institute for Integrated Circuits (IIS) knows what nursing staff really want – because its researchers asked them. At present, large-scale practical trials are being run to shape the future of nursing: with the latest technology assisting at a modern care facility for seniors in Bavaria.

Everydone does their bit – and technology makes your life easier: this is the motto for the future of nursing. Staff shortages already affect this sector right now and the situation is only set to get worse: the Federal Statistical Office estimates at least 280,000 additional nursing staff will be needed by 2049. To counter this shortage the nursing team at "Haus Curanum" in the Northern Bavarian town of Karlsfeld are testing digital assistants that they themselves chose as part of the "Pflege 2030" project (Care 2030 – funded by the Bavaran Ministry of Health). All this was made possible by Thomas Wittenberg, computer scientist and medical technology expert at the Fraunhofer Institute for Integrated Circuits IIS headquartered in Erlangen and his team: "We asked nursing staff at the "Korian Stiftung für würdevolles Altern" (Korian Foundation for Aging in Dignity) to select ten technologies. These are now being tested in parallel for one year, supported by the companies who made their developments available for these practical trials."

The nursing staff's wish list covered a variety of different fields – such as assistance with work organisation or with therapy tasks. Ranking first on this list was not an assistive robot, as you might assume, but a voice-controlled tablet that allows staff to record how the 165 residents are each day. "Until now records were typed in by hand using wired PCs," says Wittenberg.

In line with nursing staff wishes, medication planning for residents and recording the condition of their wounds can now be done digitally. Computer scientist Wittenberg describes further technologies deployed here: "In some rooms we've installed sensors that detect when somebody gets out of bed or even sustains a fall. To prevent injury like this a night light goes on automatically."

In addition to the already approved procedures, the Fraunhofer scientists also used their own technologies not yet available on the

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market. In cooperation with a toilet seat manufacturer they installed sensors on the seat – “this makes for easy electrocardiograms (ECGs) as residents automatically place their thighs on the electrodes when they sit down on the seat,” explains the expert. Then there is a mattress that prevents decubitus ulcers from forming: this consists of individual foam cubes that can be switched around and adapted so that not all parts of the body touch the mattress.

Though robots do obviously also feature in the trials – a basic one just cleans the corridors of the care home. And an advanced model to be trialled over a number of weeks can remember faces and carry on conversations. “We’ve also planned to deploy a nightwatch robot that can detect emergencies with the help of its radar and get help,” says Thomas Wittenberg. Already in use so residents can at least travel in their thoughts are VR goggles that conjure up the landscape around Lake Tegernsee or life in Berlin in the 1930s.

To make all these technologies work in parallel Wifi had to be installed throughout “Haus Curanum”. Another challenge was to also make those more sceptical about technological developments actually embrace tomorrow’s nursing care. Initial feedback from staff shows their efforts seem to be paying off as the overall verdict is they are “quite satisfied”. The aim is to free up their time so staff can engage with greater empathy with the residents while the machines work efficiently in the background. At the end of the year, they will assess how well all this went. If successful, the big question will then be: how can these tried and tested technologies be made available to the public – in other words, how can they be funded by care facilities or on their behalf? Thomas Wittenberg and his team are eagerly awaiting future solutions.

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For further information on the care facility of the future go to Fraunhofer IIS:
https://www.iis.fraunhofer.de/de/ff/sse/health/digitale-pflege/pflege2030.html

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