

## Smart Health

**Increasing population ageing and rising health-care costs mean that people have to live longer at home and that more care has to be provided by fewer people. Almost every Western country will feel the effects of population ageing in the coming years. In the Netherlands, the demand for care – and therefore its cost – will increase and the workforce will decrease. In addition, patients are becoming more emancipated and expect to be treated like clients.**



How do we enable people to live happily, safely and healthily in their familiar surroundings for as long as possible? How can doctors and surgeons provide effective care? The answer: By using technology applications that improve the quality of patients' lives at home and in their everyday surroundings; by applying technology as widely as possible across care, convenience and comfort services; by using technology – such as robotics – that helps doctors and surgeons increase their efficacy.

### Smart Health

Dutch care providers and knowledge institutes are working hard to respond to an increasing demand for care, a declining workforce and cutbacks in the health-care sector. For the collaborative partners, Smart Health 2020 will enable people to maintain, and possibly even improve, their quality of life. Their aim is to apply smart technology that improves the quality of life in the area of care, living conditions and wellness while reducing costs and generating economic gain.

To ensure their goal has been achieved, extensive tests will be run together with inhabitants of the Brainport region, for example, on a video-voice link that enables the elderly and the sick to easily contact their doctor or informal caregiver or a panic button that immediately alerts the police or emergency services in the event of an emergency. All of the applications are developed with the users' needs in mind, such as 'exercise at home', an application that enables people to follow exercises on the TV while getting tailored physiotherapy and fitness instructions through IT devices. Or the panic button, which automatically alerts the police or another service in the event of an emergency. Soon, all night calls in a neighbourhood or village will be answered by an advanced care centre that will notify one of the care provider's nearest first responders. Using wireless technology to provide services to patients and jointly organizing night-time care will also help reduce the cost of home care.

### Patients as early adopters

The Dutch believe that it is not only important to involve doctors in innovations at an early stage but also end-users. Philips Healthcare, for example, always puts people first by asking what it can do to make

things easier for patients and care providers. Innovations should incorporate the entire care chain and aim for an overall improvement of clinical pathways: from prevention to screening, and from diagnosis through to therapy and post-hospital care. Philips Healthcare knows that innovative solutions consist of more than standalone medical systems, which is why its goal is to provide a comprehensive suite of solutions that improve the care chain as a whole all the way from patient care through to the workflow of care professionals. In order to achieve this goal, Philips Healthcare is constantly looking for collaborative partnerships that optimize the way in which innovative health-care reaches patients. Philips Healthcare involves care providers, patients, the industry and insurance companies in the research and development of medical innovations to ensure they are a real and immediate benefit for patients and society.

## Surgical robots

Eye surgeons must be very precise in order to avoid damaging delicate tissue. The eye robot for haptically assisted surgery (Eye RHAS) that is currently in development at the Eindhoven University of Technology (TU/e) will give them practical support. The robot takes eye surgery to a whole new level by enabling surgeons to perform procedures that are impossible to do manually. It also enables older surgeons, who generally have shakier hands, to work longer in their profession.

Take retinal vein occlusion, a blockage of the small veins that carry blood away from the tissue at the back of the inner eye, the retina. Scar tissue sometimes forms on the surface of the retina and needs to be removed in order to restore the patient's eyesight. The eye surgeon makes a small incision in the eyeball and uses tweezers and a scraper to lift and remove the damaged tissue. In this type of surgery, the incision functions as pivot point: When the surgeon rotates his or her hand to the right, the instrument in the eye rotates to the left. Surgeons have been trained on this particular phenomenon, but it doesn't make the surgery any easier. And surgeons would prefer to remove the cause of the problem, namely the blockage in the vein, but the veins are so tiny that they are restricted to treating the effect by removing the scar tissue. The robot increases the surgeon's precision and improves his/her ergonomics and efficiency, making the one million procedures performed around the world each year easier and more efficient, therefore reducing the risk of complications. Retinal vein occlusion is the second-most important cause of poor eyesight and blindness in the Western world. But progress is in sight thanks to an eye robot!

## Collaboration

The TU/e works closely with TNO and Academisch Medisch Centrum Amsterdam. But to take developments a step further and put the robot to work in a real clinical setting, the partners needed a company, which is why they established the spin off Medical Robotic Technologies BV (MRT). MRT is currently working on a clinical prototype that will be used to market the product. It will be another few years before the robot can be used in hospitals.

The Dutch have a real knack of combining care, mechatronics and IT into smart products and life-enhancing applications, and are masters at multidisciplinary collaboration: between doctors, care providers and technology suppliers; between training hospitals and technology companies; between companies and universities; and between patients and care providers.

### For more information

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