



Cover Story

# New Care Delivery

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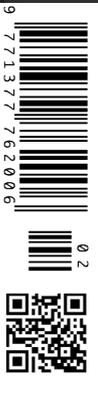
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# Innovating in Healthcare: Hospital Admissions at Home

◆ Author: [Astrid van der Velde](#) | Manager Cardiology Group | Isala Heart Centre | Zwolle | The Netherlands  
| Project leader | NWE-Chance

◆ Author: [Ed de Kluiver](#) | Chairman | Isala Heart Centre | Zwolle | The Netherlands | Board member | Dutch Cardiovascular Association

Today's hospitals are not yet the hospitals of the future. Emerging societal challenges are demanding a shift towards hospital care at home. Although telemedicine, like telemonitoring and telerehabilitation, has been getting more popular in recent years, hospital admissions at home are still in their infancy. Current organisational and technological barriers prevent large-scale implementation of hospitalisations at home. Once these challenges have been overcome, hospital admissions at home will help innovate healthcare and move it towards a more sustainable model. There are even possibilities for international expansion.

## Key Points

- Hospitals today are not yet the hospitals of the future.
- Hospital admissions at home have many advantages.
- To implement hospital admissions at home on a large scale, current organisational and technological challenges have to be overcome.
- New developments – like digital therapeutics, artificial intelligence and nanotechnologies – provide opportunities to innovate in healthcare.
- Exploring hospital admissions at home together has international potential.

## Time for Change

Increased pressures on healthcare budgets, the ageing of the population, and reduced hospital capacity provide a clear need to modernise today's healthcare system.

It is a widespread misconception that a hospital is always the best place for patients. In fact, hospitals can be harmful environments for patients, especially for elderly people. Adverse events like delirium, hospital infections and trauma arising from falls are common among admitted elderly patients (Hsieh et al. 2015). These events lead to an increased risk of intensive care admissions and mortality.

The current COVID-19 pandemic emphasises significantly the need for hospital care at home. The good

news is, therefore, that there is at least now a chance for change.

There are many options for development. The technology sector is booming and can facilitate the introduction of digital health and therapeutics (EHTEL 2020). Artificial intelligence and nanotechnologies are taking off. Changing social values are creating pathways for integrated care, often supported by technologies, in the living environment of the patient.

## Virtual Heart Centre

The virtual Isala Heart Centre was launched at the beginning of the 21st century. It is part of Isala Heart

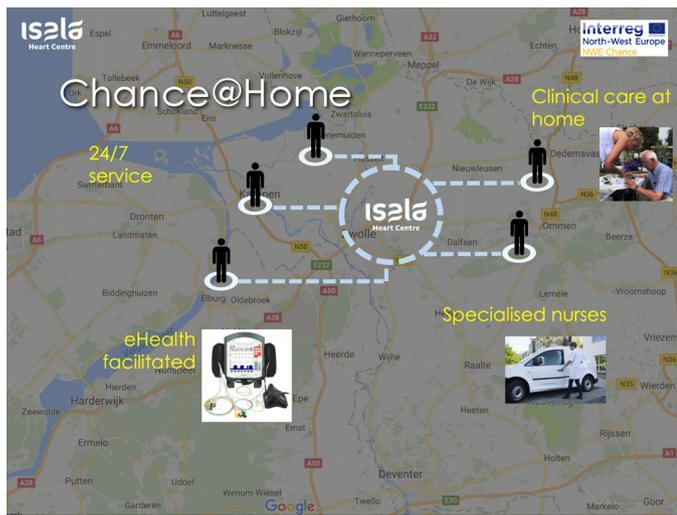


Figure 1. Chance@Home Service.

Centre, the largest non-academic heart centre in the Netherlands, which provides a virtually complete palette of cardiac care to patients in a large geographic region. Its headquarters are in Zwolle, the Netherlands.

A virtual heart centre – like Isala – is all about providing hospital care in the living environment of patients. It provides hospital care with healthcare professionals who are available at a distance, and it uses eHealth and mHealth, sensors in/on a patient, and point-of-care technologies. Basically, this is hospital care without a ‘brick’ hospital. The services offered by the Isala virtual heart centre consist

provides integrated care, which requires a strong collaboration between patient, nurses, medical specialists, general practitioners, the pharmacy, informal caregivers and home care.

Today, more than 6,000 Isala patients are treated at home. Chance@Home is used for both cardiac and pulmonary patients. Around 80% of them are heart failure patients. Patient and professional satisfaction is high. Preliminary results show that vulnerable patients benefit the most: the percentages of delirium, infections and falling trauma are low, and patients are more active.

Hospital admission at home costs on average 40% less than a regular hospital admission. However, hospitals are often not reimbursed by health insurance companies for hospital admissions at home. By providing better outcomes against lower costs, Chance@Home could in reality be a paragon of value-based health care.

With the societal drive for innovative solutions to cope with a rapidly increasing number of chronic (heart failure) patients, there is a need to upscale and professionalise the Chance@Home initiative. Until recently, Chance@Home has been a local initiative; it has the ambition, however, to develop further into a fully mature service that can be replicated. Both organisational and technological innovation is needed for its scale up.

### Scaling Up Chance@Home Way of Working

Scaling up requires a solid and professional organisation with a quality system, excellent logistics, and a help desk/

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of telemonitoring, mHealth-guided cardiac rehabilitation, mLearning, a virtual cardiac emergency unit, and a service called Chance@Home.

### Hospital Admissions at Home: Facts and Figures

In 2004, the Isala Heart Centre started a pilot for treating heart failure patients at home: Chance@Home (Figure 1). The pilot concluded that home-based administration of intravenous medication by specialised nurses was a feasible, effective, safe and patient-friendly alternative for regular in-hospital care for known chronic heart failure patients who experience high-risk, acute increases in disease symptoms (Van de Wetering et al. 2004). After this successful pilot, Chance@Home was then offered as a regular service. It is a service that

call centre. Once out of the pilot phase, Chance@Home quality will need to be assessed on a structural basis, and randomised clinical trials will have to be performed.

Hospitalisations at home require excellent logistics. Healthcare professionals have to provide a 24/7 service to patients who are admitted at home. Cars must be equipped with all necessary medical technology (like a mobile ECG, medication, and laboratory supplies). Questions need to be answered quickly. Furthermore, scaling up requires an integrated technology with a platform for both healthcare professionals and patients, and the connectivity of technology in a multivendor environment.

Yet, some challenges remain. With the introduction of a variety of technologies to support hospital care at home, the provider doesn’t want to bother the healthcare

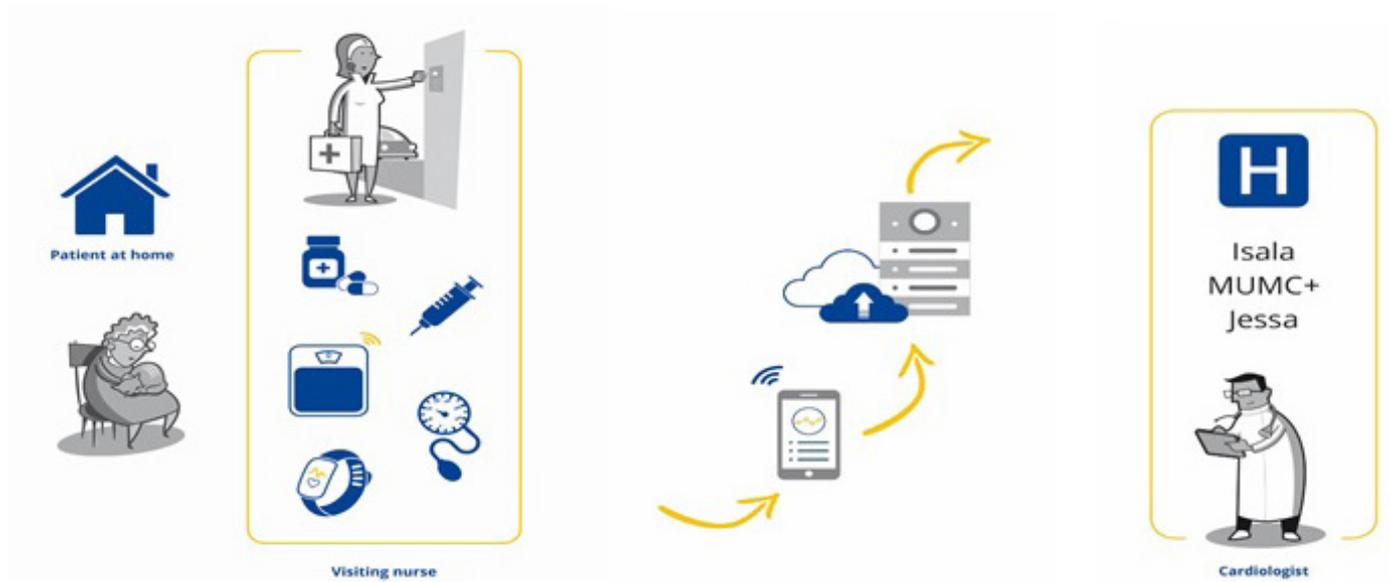


Figure 2. Hospital Admissions at Home, NWE-Chance.

professionals with different kinds of output. The healthcare team should be provided with a single overview containing all relevant outcomes measured by the different technologies. Patients should have access to the most relevant information regarding their hospital admission at home, and should be supported in this process by an eCoach, for example.

### International Potential

In recent years, hospitals have provided more ambulatory services at home. However, the delivery of hospital admissions at home is still in its infancy (Levine et al. 2018). The organisational and technological innovation of hospital admissions at home – that is so desperately needed to make possible a world-wide transition in healthcare – is addressed by the [NWE-Chance](#) consortium. This consortium consists of ten partners (medtech companies, hospitals, universities and network organisations) in three countries (the Netherlands, Belgium and the United Kingdom). NWE-Chance promises the development or optimisation of a number of integrated eHealth applications (blood pressure, weight and oxygen saturation measurements, a vital signs patch for heart rhythm,

respiratory rate, posture and activity plus an eCoach): they will be used to admit heart failure patients at home. The feasibility of both technology and the supporting care process (Figure 2) will be tested by three hospitals (each hospital has a different state of organisational readiness with respect to hospital admissions at home). NWE-Chance will also launch an innovation hub to bring the stakeholders involved in this organisational shift together: they will share their knowledge with respect to home hospitalisations.

All these initiatives are made with the aim of enabling a profound, sustainable transition of the healthcare sector by implementing hospital admissions at home on a large scale. It is hoped that this shift can be expanded not only in Zwolle or the Netherlands, but in a collaborating country, Belgium, as well. Such innovations in healthcare may even be extended more widely internationally.

### Acknowledgements

NWE-Chance has received funding from the Interreg NWE Programme under grant agreement number NWE 661.

### Conflict of Interest

None. ■

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