Heart Hospital’s patient flow analysis shortened patient transfer distances and released more time for patient care in the new hospital

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Before Tays Heart Hospital moved into its new facilities on the Tampere University Hospital campus in 2018, ensuring fluent patient care and high patient safety was a key goal in designing the new hospital. A study was conducted to analyse the patient flows of specialty units that previously operated in different buildings, as a result of which patients’ transport and transfer distances decreased in the new hospital by as much as 33% a year.

Opened in 2018, the new Heart Hospital’s design process had already started in 2013 when a patient flow analysis and layout planning were prepared between different specialty units – cardiology, cardiac surgery and cardiac anaesthesia. The patient flow analysis was a natural way to acquire information on the current patient flow and to prepare a proximity ranking for the new facilities and hospital units. The proximity ranking included priorities, based on which key functions were positioned close to one another.

“We conducted the patient flow analysis early on when designing the new hospital before the architectural design phase started. In the analysis, we defined patient routes over one year,” says **Sauli Karvonen**, M.Sc.Eng., from SKA-Research.

“The majority of the dataset consisted of inpatients, who numbered 5,600 in total and who travelled through different process routes in the hospital. Altogether, there were 35,962 inpatient transfers between different functions a year, with the patient flows generating a complex flow model.”

Adding smoothness to complex routes

The relative locations of the new Heart Hospital’s facilities and units were based on the results of the patient flow analysis. The distance of each individual route was calculated at both old and new Heart Hospitals, after which the figures were totalled. After Heart Hospital’s move, patients’ transport and transfer distances decreased by 1,857 km a year, or 33%.

“Employees’ walking distances shortened. In inpatient wards with two nurse stations, patient rooms surround the nurse station, minimising the distance between patient rooms and nurse stations. The distances between different patient rooms were also minimised. Because a typical cardiology patient’s stay in the hospital is only one to two days, single and double rooms were designed according to needs which shortened corridors in inpatient wards and the distances travelled by patients and staff,” says Karvonen.

“Ambulances arrive in the basement, from which the catheterization laboratories and the cardiac care unit are directly accessible via lifts. The location of Heart Hospital next to the entrance to Tampere University Hospital enables direct access for elective heart patients from the parking garage, tram stop and the drop-off and pick-up area.”

A smooth flowing care path reduces risks

According to **Timo Porkkala**, Anaesthesiology and Intensive Care Service Director, who participated in the design of Tays Heart Hospital, shorter patient transfers improve patient safety as the high-risk transfer stage is shorter.

“When designing the hospital, we placed the key functions required in the care of cardiology patients, as well as cardiac and cardiothoracic patients, on separate floors. Key functions for cardiology patients (cardiac care unit, inpatient ward, catheterization laboratories, and day ward) were placed on the second floor, where the patient flows between functions will be clearly the largest in Heart Hospital. For the same reason, key functions for cardiac surgery patients (operating theatres, cardiac surgical intensive care unit, inpatient ward, X-rays) were placed on the third floor,” Porkkala says.

“By minimising the distances travelled by employees in wards, we can release more time for patient care. This supports not only patient care, but also wellbeing at work. Shorter distances support teamwork and

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facilitate communication inside the ward and between adjacent functions.”

Productivity also increases the effectiveness of care

Increasing the productivity of public healthcare is a challenge in our healthcare sector. Shorter distances have, in part, supported the new Heart Hospital’s positive productivity trend. As a result of the new hospital, Heart Hospital has already reached a higher level of productivity.

The study was conducted by Sauli Karvonen, M.Sc.Eng., Managing Director of SKA-Research and the developer of the patient flow analysis. The study based on Heart Hospital’s analysis has been published in the international Health Environments Research & Design Journal *(“Patient-Flow Analysis for Planning a Focused Hospital Layout: Tampere Heart Hospital Case”*). The study was co-authored by **Markku Eskola**, hospital director of Tays Heart Hospital, Timo Porkkala, Anaesthesiology and Intensive Care Service Director, and **Aki Haukilahti**, group CFO at Tays Heart Hospital.

Link to the study: https://journals.sagepub.com/doi/full/10.1177/19375867221086199

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