

Medtronic

Integrated Health SolutionsSM

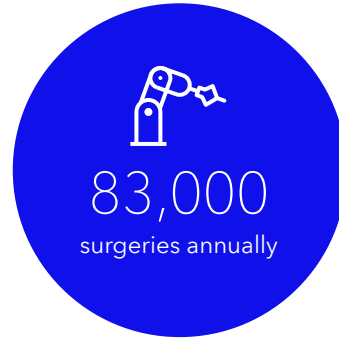
Optimising managed services in operating rooms

Lessons from
Aarhus University
Hospital

The hospital

Aarhus University Hospital (AUH) is the second-largest hospital in Denmark with over 900 beds and 9,000 employees. The hospital covers the majority of all specialised services in Denmark. Known for its robust research, AUH conducts roughly 83,000 surgeries annually and has one of the shortest patient length of stays across Europe.

AUH is consistently ranked as the top hospital in Denmark. According to Newsweek Magazine, AUH was ranked 19th in the global Smart Hospital rankings. Hospitals on the list *“lead in their use of artificial intelligence, robotic surgery, digital imaging, telemedicine, smart buildings, information technology infrastructure and electronic health records.”* The majority of these hospitals are in the US and AUH is among just four European hospitals in the top 20.



The hospital puts particular emphasis on a whole-person approach, creating results through collaboration and having the highest levels of professionalism.

The challenge

AUH had ambitions to build on its reputation and achievements. As a result of the specialised care provided, there is always a demand to treat more patients.

The hospital sought collaboration with industry to glean external perspectives to function in the most efficient ways possible. AUH wanted to leverage innovation and data, particularly around operating room activities to free up capacity - both financially and on the nursing side.

To address this challenge, AUH decided to collaborate with Medtronic, in part due to the company's experience optimising managed services in more than 150 hospitals in 20 different countries. AUH prioritised the Neurosurgery Department as a starting point for the partnership. Depending on the results, AUH and Medtronic could then partner in other departments.

Medtronic and the Neurosurgery Department aligned on the following five partnership outcomes:

- **Optimise and professionalise** core activities such as operational planning and the use of resources.
- **Reduce waste** and free up nurse resources.
- **Bring new competencies** in terms of operational optimisation and planning.
- **Strengthen the organisation** and ensure the well-being and engagement of employees.
- **Leverage international benchmarking, collaboration and knowledge exchange** with other university hospitals.

There were various components to the partnership. Two particular solutions are highlighted below.



1 ACHIEVING SIGNIFICANT SAVINGS BY REIMAGINING MATERIALS MANAGEMENT

Medtronic's work on materials management initially involved a comprehensive review and the creation of a department Procedure Catalogue. The team input all products into a Medtronic cloud-based software system to better understand usage for specific procedures.

The start-up phase took three months, and Medtronic then launched the service delivery stage in February 2020. Two Medtronic employees are on site every weekday to manage all aspects of materials management: ordering and receiving, filling up products, collaborating with nurses about their different needs around materials management, scanning what has been used and storage room optimisation, among other priorities.

These Medtronic experts are considered part of the hospital team. As a result of the data-informed decisions, the hospital stopped ordering "for stock purposes". Instead, the focus was on the actual consumption data.

Decisions and actions could then be taken based on the different materials' unique risk product portfolio. These actions prevent the discarding of expired materials.

Among the keys to Medtronic's success in the area of materials management is:

- The opportunity to customise the process for each department.
- Bridging logistics knowledge with the specific department's expertise.
- Brand agnostic: the process can be applied to any product (not only Medtronic devices).

With the insights gleaned from the Medtronic process on materials management, the Neurosurgery Department was able to immediately save 5 million Danish krone (DKK), which is approximately 675,000 Euro. These savings were achieved within the first year of the partnership. The waste reduction is at 3.9 million DKK to date (still counting).

Medtronic took over the logistics processes from nurses in the department. This freed up nursing capacity. Approximately two nurse full-time equivalents have been released.

// Efficient utilisation of the department's four operating suites is crucial to ensure that patients have timely access to non-elective and elective neurosurgical procedures."

- Dr. Gorm von Oettingen,
Chief Physician at AUH

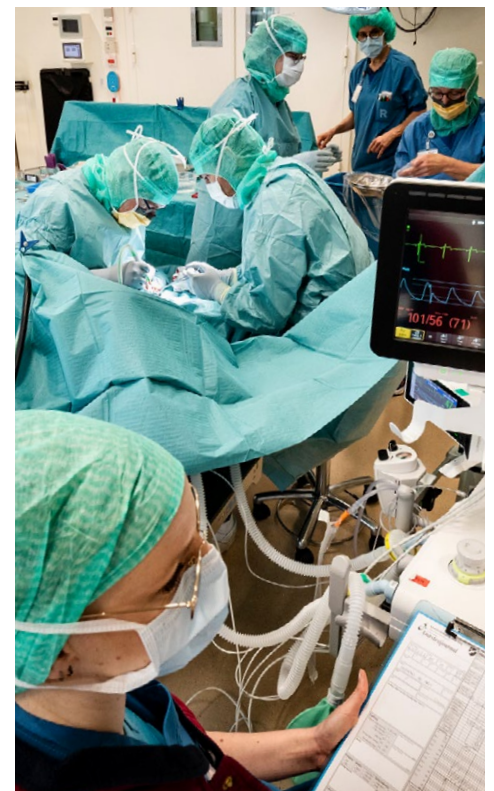
// The collaboration with Medtronic has shown us that data-driven optimisation can create value for hospitals, clinical staff and patients. Medtronic has brought insight and tools, allowing us to use and allocate resources to match capacity and demand much more beneficially. It's a partnership where we work together for change and improvement."

- Dr. Gorm von Oettingen,
Chief Physician at AUH

#2 ENHANCING THE STAFF AND PATIENT EXPERIENCE THROUGH ROOM OPTIMISATION AND PLANNING AND SCHEDULING

Specifically, the Neurosurgery Department aimed for a better understanding of the allocation of operating room time slots for acute patients in the elective program. There were no free time slots for acute patients. Thus, the planning of these patients was done ad-hoc. Cancellations were increasingly a source of frustration for nurses and patients as roughly five elective patients were cancelled weekly.

First, **Medtronic leveraged its unique mathematical approach for operational scheduling.** This approach draws upon a decision theory that provides a mathematical framework for modelling decision-making. This model provided a planning and scheduling strategy for acute surplus slots in the Neurosurgery Department.



Secondly, **Medtronic deployed a pilot and tested the model**. It involved choosing a block of hours each weekday to operate on acute patients. A pilot was then carried out to compare the results from the same time period of the previous year. Based on this, an assumption was used and factored into activities. There was an impact from this pilot in several areas. Notably, Medtronic was able to support the department in working differently to understand operational performance using analytics to predict outcomes.

The project led to nurses working in new ways. One of the project's goals was to transform how staff worked to retain the nurses and improve their working environment, particularly in operating rooms. Nurses were so accustomed to working frantically and in a stressful environment. Because of the changes made, nurses were now working in a much

calmer and positive environment. As a result of this change, many of the physicians and nurses in the department actually thought they weren't treating as many patients as before. Medtronic presented data that revealed a surprising reality: more patients were now being treated in the ORs, both acute and elective patients.

In addition, coordinators have experienced a smoother, calmer planning process upon the arrival of an acute patient due to a clear definition of roles and responsibilities.

A third part of the solution consists of **Medtronic consultants collaborating with the department around change management and optimising operations**. The overall project for operational planning subsequently enabled the entire department to give full focus to the optimised patient program, allowing room for increased activity by mitigation of cancellations and focus on the optimal patient flow.

In the 35-week implementation period in 2021, this new allocation strategy resulted in:

a significant
77% decrease in the cancellation of elective neurosurgical procedures when compared with the same period in 2019

a significant **16% increase in surgical productivity**

an **8% decrease in the number of acute surgical procedures** performed during the night was noted

The increase in activity resulting from the planning and scheduling project has led to financial benefits as the department was able to take on an increased number of back spine operations from the private sector, leading to up to **270,000 Euro in savings yearly**.

// This project shows that applying mathematical modelling to solve complex capacity distribution problems in surgery planning has the potential to increase patient access and, at the same time, improve the working environment for staff."

- Head of Neurosurgery



Next steps

Following these demonstrable results within the Neurosurgery Department, other units within AUH are now exploring how they can leverage such projects to bring about a similar impact by analysing capacity and resource allocation using data-driven models.

About Medtronic IHS

Medtronic has been one of the main market leaders in innovative medical technologies for the last 65 years. Aware of the need to balance treatment access, the associated costs and the quality of care, Medtronic created Integrated Health SolutionsSM (IHS). The IHS division relies on Medtronic's investment capacity, its expertise in process optimisation, and its deep knowledge of therapies in order to propose global and personalised solutions to healthcare institutions. An approach based on cooperation with medical institutions to help them move towards a value-based organisation, improve the quality of care, optimise operational performance and increase financial results.

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Medtronic International Trading Sarl
Route du Molliau 31
Case postale
1131 Tolochenaz
Switzerland
Tel: +41 (0) 21 802 70 00
Fax: +41 (0) 21 802 79 00

[medtronic.eu](https://www.medtronic.eu)

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