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Integrated Health Solutions[SM]

Case Study: How Pisa University Hospital increased weekly TAVI capacity through an improved pathway

Pisa University Hospital
Pisa, Italy

Overview

Heart centers in Italy have seen demand for transcatheter aortic valve implantation (TAVI) procedures grow by 21% over the last seven years. The Tuscany region sees 30% more TAVI patients than the rest of Italy due partly to an aging population and increased adoption. At the same time, heart centers are dealing with scarce resources and cost sensitivity. Therefore, they must maximize operational efficiency and productivity to ensure patients have timely access to this procedure.

30%

more TAVI patients in the Tuscany region than the rest of Italy

A heart center must systematically analyze its operations to achieve TAVI operational excellence. This requires visibility into current performance, knowledge of TAVI best practices and sustainable implementation, and a mindset of continuous improvement. By optimizing the TAVI pathway, heart centers can unleash greater productivity while maintaining or improving the quality of care.

The Hospital & Heart Center

In Italy, the Cardiac Catheterization Laboratory (Cath Lab) of Pisa University Hospital (Azienda Ospedaliero Universitaria Pisana, or AOUP) is a high-volume TAVI procedure center.

It is one of the most important Italian centers for Cath Lab procedures, with considerable demand from local patients and 202 TAVI implanted in 2021. One of the center's objectives is to set up a network with the leading heart hospitals in the North-West Tuscany area and strengthen its position as a hub center of reference for TAVI procedures.

Medtronic has worked in a strategic partnership with the hospital for several years. For this project, the hospital enlisted IHS to help them increase the number of TAVI procedures per year to help meet demand while ensuring good clinical outcomes and a positive patient experience, all while cost-effectively improving resources and capacity utilization.

The Challenge

Pisa University Hospital aimed to be more responsive to the increasing demand of Tuscany population to have access to TAVI Procedure. To do this, the hospital wanted to increase process efficiency and volumes, optimize patient pathways, and utilize its full capacity potential. Specifically, it aimed to solve the following:

1

Planning and scheduling issues

The nurses' schedules were not conducive to performing TAVI procedures, especially in the afternoon when only three nurses were present to cover two different Cath Labs - the same amount needed to cover a single TAVI procedure. In addition, planning was not optimized. The nurses' day-to-day activities, delayed start times, and lengthy turnover between procedures meant the hospital could only perform an average of two TAVI procedures per day.

2

Procedural issues

The scheduling activity pattern and the strong impact of emergency procedures - at least 30% of daily procedures - did not optimize the efficiency of the Cath Labs and exacerbated the planning and scheduling issues mentioned above.

3

Post-procedural issues

The high bed occupancy rate during the year, with weekly peaks over 85%, and a slightly higher LoS than the top-performing European centers were mainly due to the following:

1. Patient hospitalization the day before the procedure
2. Several pre-procedure blood tests often lead to longer hospital stays for the patient

In addition, the Cath Lab Unit of Pisa University Hospital required additional ward beds to support current structural heart procedural volumes (6 beds). Varied demand throughout the year, a low ICU bed occupation rate, and a lack of Cardiology ICU and sub-ICU beds reserved for Interventional Cardiology/Structural Heart procedures meant the hospital needed to utilize post-surgical ICU beds to meet increased demand, using more resources and costing more money.

The Solution

The hospital engaged Medtronic IHS to implement the TAVI **Pathway Optimization** Project with these objectives in mind:

- Increase the number of daily/weekly TAVI procedures without increasing resources
- Define a referral network model, structuring itself to be able to respond to the growing demand for TAVI Procedures and to set up a network with the leading heart hospitals in Northern West area of Tuscany by looking at the following critical aspects:
    - Share patient's evaluation and clinical processes with spoke centers
    - Facilitate a real-time image-sharing process with other centers
    - Set up a structured heart team to share clinical information during pre-care and follow-up phases
    - Improve the interaction and attendance of spoke centers during the procedure
    - Train spoke centers on the latest procedural techniques and device updates
    - Improve the speed of patient care and hospitalization (slot availability)

The Medtronic IHS team worked together with multiple stakeholders in the hospital team, including Cath Lab clinicians, assistants, nurses, cardiologists, and management. The goal was to evaluate the Cath Labs' performance and inefficiency drivers, to scan other related services (i.e., outpatient clinic, ward, radiology service), and list areas of improvement along the entire patient pathway (from referral to follow-up). The IHS team also needed to identify the main challenges for the center to cover spoke centers' needs in a referral network model.

Working together, we successfully:

Optimized procedure planning by:

- Optimizing the nurse staff's shifts by reorganizing weekly timelines with the ability to perform up to 6 additional TAVI procedures per week – a potential 50% increase
- Adjusting the procedure schedule to minimize peak demand
- Improving communication between planning, Cath Labs, and other wards to define new weekly cross-department planning to reduce the unpredictability of daily procedures

Reduced LoS and freed up ward capacity by:

- Setting up a **Day Service Model** for the pre-procedure consultations and examinations (i.e., CT scan, blood tests, hydration, etc.) to decrease the TAVI LoS of at least one day for TAVI patients
- Setting up a sub-intensive therapy center dedicated to the Interventional Cardiology and Cardiosurgery wards to:
    - Decrease the ICU beds occupied by Cardiosurgery patients and decrease the cost of their hospitalizations
    - Improve the capacity for both the departments

Increased daily production levels by:

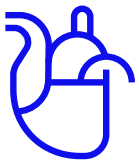
- Increasing on-time starts and reducing changeover time
- Managing empty spaces and scheduling more TAVI procedures per day

Evaluated a referral network model by:

- Identifying the main challenges for AOUP to recruit patients from spoke centers in the area
- Shaping a value proposition for AOUP to become the "Ideal Hub Center" in the TAVI care pathway by analyzing the key drivers for the spoke on selecting the Hub center for their patients
- Strengthening and expanding the referral network by increasing awareness and education around spoke centers and setting up an operative and clinical protocol for the referring process
- Assessing opportunities to digitalize the referring process and care pathway with a long-term referral strategy

The Impact

The hospital successfully increased the total annual number of TAVI procedures without adding resources or infrastructure, but increasing the efficiency of each phase of the patient journey. The impact was significant:



Increased TAVI procedures by **20%**

Reduced the average LoS by at least **1 day** per TAVI patient

Increased annual revenues thanks to the optimization of the patient pathway

In addition, patients are experiencing a smoother admission process, less time spent anxiously awaiting the procedure during the pre-procedure day, and shorter hospital stays – with comparable clinical outcomes and complication rates. Furthermore, because of the increase in TAVI procedures, the hospital is on its way to achieving its goal of becoming a reference center in the region.

What the Hospital is saying

> Due to Medtronic IHS' expertise and structured and multidisciplinary approach, we were able to increase production levels and realize our growth ambitions.

Head of Interventional Cardiologists

> The data collection and process analysis are not competencies of physicians: we need to rely on specialized consultants. The consultant's point of view may highlight criticalities that we cannot see (or do not want to see).

Interventional Cardiologist & Project Manager

> Medtronic IHS team did a highly valuable and outstanding job and surpassed expectations.

Chief Administrative Officer

About Medtronic IHS

Integrated Health Solutions builds on Medtronic's unique combination of capital resources, process optimization expertise and therapy knowledge. In cooperation with medical institutions, IHS develops innovative services and solutions to improve efficiency, reduce costs, facilitate patients' access to different types of treatment, and improve outcomes.

Would you like to know more about what IHS can do for your hospital? Learn more by visiting our website,reaching out to your Medtronic contact or emailing us at: integratedhealthsolutions@medtronic.com

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