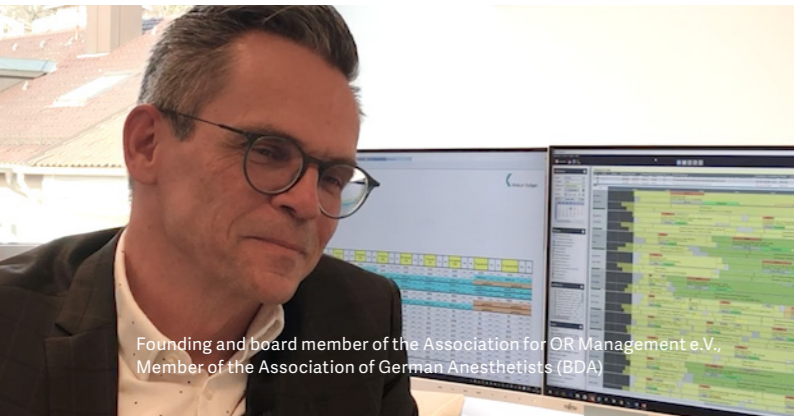# Klinikum Stuttgart increased profit by 4% with Torin OR Management solution

Forward planned surgeries, efficient processes, maximized utilization, aligned communication, streamlined workflows and optimized performance led to a 3.4% increase in surgeries and a 4% increase in earnings in 2019 at Klinikum Stuttgart in Germany.

**Dr. med. Thomas Ramolla, MBA,
Head of OR-Management at Klinikum Stuttgart
in Germany**

"Standardization, transparency, workload reduction with the help of our integrated Torin OR management software provided a decisive contribution to managing our tasks in the complex requirements of today's OR management."

Founding and board member of the Association for OR Management e.V.,
Member of the Association of German Anesthetists (BDA)

At Klinikum Stuttgart, a few years ago, the major objective in our surgical department was to keep punctual start and defined suture times. Nowadays, the requirements are much more complex. In today's OR management, you must manage the balancing act between quality, cost and time.

The balancing act between complex requirements

It is essential for us that we safeguard a high quality of care, says Dr. Ramolla. It is about managing the hospital economy, ensure profitability and at the same time provide the optimal medical care for our patients.

"We must ensure optimal use of our resources and constantly utilize available capacities, especially in times of shortage in trained and skilled staff."

OR management plays a key role for us at Klinikum Stuttgart. The surgical department is the most cost-intensive department in every hospital. It can create an important bottleneck that determines speed, efficiency, and quality of care. A higher standardization of workflows and resource utilization is the key to profitability, efficiency and risk reduction, Dr. Ramolla explains.

Over the years, I have learned that improved planning, coordination, and quality of all processes involved, opens up for considerable savings potential, relieves the workload on our staff and ensures the quality of care of our patients.

Plenty of room for improvement

Klinikum Stuttgart is one of the largest hospitals in Germany. The hospital generates an annual turnover of approximately 650 million Euro and the surgical department has an annual budget of around 200 million Euro.

When I started working for Klinikum Stuttgart in 2017, we analyzed our use of resources and benchmarked our process times against the average value of other high-performing hospitals. So we decided to update our OR Management with a lot more SOPs (Standard Operating Procedures) and we implemented Torin* in September 2018. The results were evident and showed plenty of room for improvement in capacity management as well surgical and resource planning, says Dr. Ramolla.

OR capacity and staff were not adjusted for the actual requirements. Our rather inefficient surgery planning process accounted for a considerable part of delays and disorganization. Process times and staff were not well planned and changes to the surgery plan were dealt with in a relatively disorderly manner.

This had a particularly unfavorable effect on the morning start, which was often late due to delays in the upstream process steps and thus impaired the schedule quality of the entire day. We often experienced unnecessary delays to occur in incision-to-suture times and suture-to-incision times. More important, this sometimes led to cancellations of scheduled surgeries or overtime work for the surgical team.

"Discontinuous OR utilization diminish economic potential and can negatively influence employee satisfaction and quality of care."

At that time known as myMedis in Germany

Efficient surgical planning is the key to success.

4%
profit increase

15 min.
saved before first morning cut

3.4%
increase in no. of surgeries
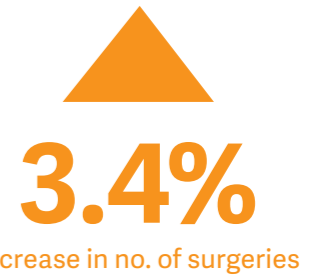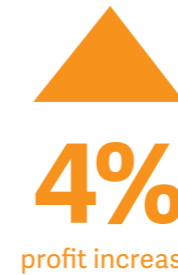
The cornerstones of our change management

During the strategic capacity planning, we coordinated elective and emergency surgery volumes to align our resources of staff, material, OR capacities and time with the number of surgeries projected for each OR. Process times and perioperative process times were defined and set as key performance indicators (KPIs).

Workflow optimization performance measures were considered next, including time of first suture, sluice, anesthesia release and incision-to-suture times. We also defined KPI-based standards for surgical procedures including OR set-up times, diagnostic and procedural codes and instrument consumption standards, Dr. Ramolla explains.

"An important means of realizing our ambitious plan was, and still is today, the Torin OR management software."

Torin is integrated with our hospital information system (HIS) since 2018. We use Torin for the entire surgical planning and coordination of ORs, patients and resources. The software enables us to permanently monitor all processes and provides us with a full overview of all ongoing and future planned surgeries in every OR room. To get a fast and easy visual overview, all process steps are color-coded, Dr. Ramolla points out.

Additionally, documentation of the surgical process, which was previously carried out manually, and oftentimes were non-transparent, is now completely digitalized. Medical record documentation has brought significant benefits. Postoperatively, Torin now transfers ICD and OPS codes to our HIS for billing purposes and the intraoperative utilization of instruments and disposables are booked.

Optimized performances led to about 2,000 additional surgeries carried out or a 3.4 % increase in surgeries in 2019. Through optimization, we streamlined our surgical workflows and we saved time. For example, we have been able to significantly improve the timing of the first suture in the morning by up to 15 minutes, says Dr. Ramolla.

Klinikum Stuttgart in numbers:

No. of beds:	2,200
No. of employees:	7,000
No. of inpatient/year:	90,000
No. of outpatients/year:	600,000
No. of ORs:	55
No. of surgical procedures/year:	53,000

**Data in material originates from 2019.*

Efficient planning of OR rooms and resources is key

With our new way of working, we are reallocating staff and capacities on a-need-basis and all responsibilities are reorganized and redefined. Thereby, we secure that ORs with good performances are allocated more capacities and others are withdrawn. In addition, we have adjusted the core operating hours of our interdisciplinary ORs to reflect the surgery schedule. Also, our surgery teams are now much more coordinated with one another. For example, the anesthesiologist and anesthesia is coordinated with the surgeons.

"Torin helps us map all process steps of our surgical schedule and plan perioperative process times, including upstream and downstream surgical workflows."

For the first time, we are now able to plan anesthesia times and changeover between surgeries times, Dr. Ramolla highlights. We are currently planning for a more even utilization of our intensive care beds to achieve a consistent occupancy and to avoid bottlenecks or empty beds. By considering possible over- or under-occupancy in the weekly planning and reflecting the actually incurred surgery times in the operating room planning, a much more precise and, above all, more realistic surgery planning can be achieved.

At any time, the Torin software captures all processes and changes occurring throughout the day in real time, providing reliability and flexibility in planning and documentation of our ORs. This is important especially in situations where last minute changes are made. Also, it enables us to more easily integrate emergency surgeries into the daily workflow in accordance to the respective classification and urgency.

"We now have a much better utilized surgical department with precise and reliable planning, maximized resource utilization, and efficient management of our OR capacities."

No efficiency without transparency

The daily objective analysis of our processes and KPIs are an essential success factor for the process optimization and quality assurance, we have achieved here at Klinikum Stuttgart, Dr. Ramolla explains. On the other hand, without proper training and onboarding, it can be a source of tension because all individual performances are now transparent.

In addition to the monthly reports in OR management, we have set up an automatic daily reporting of relevant key figures with red-yellow-green color coding to show delays or deviations from the predefined process times "at a glance". All key figures are automatically shared with the OR teams and published internally every day. This way, not only your own KPIs, but also the key figures of the entire surgical department become visible.

This neutral transparency and self-monitoring in combination with daily reporting and performance standards led to improved performance. We have found that resource limitation is more disciplined because it causes a more responsible use of resources and led to more efficient work, Dr. Ramolla explains.

"Transparently sharing performance metrics across our OR teams enabled us to achieve 80% of our KPI's."

Calmer working environment

Torin has proven to be helpful for our hospital, says Dr. Ramolla. For the first time, staff now have a full overview of the surgery plan and process times. For example, a color-code change in our surgery schedule overview alerts the surgeon when anesthesia release is completed, and the surgeon's presence is required. In the same way, wards can view the availability of surgeons, as well as the estimated end times of the individual surgeries. Furthermore, staff can receive notification when the next patient is ordered for surgery. For Klinikum Stuttgart, this has led to significantly fewer inquiries and phone calls.
Additionally, it has enabled us to work more calmly in the operating rooms, thanks to improved communication, says Dr. Ramolla.

Streamlined workflows saves time

Before Torin, we noticed that the transport team was not informed on time. Now, the order for patient transport is linked with the status change in the Torin software and automatically triggers a notification. At the same time, the anesthesia nurse receives a patient call to push a message on their mobile phone to start with their preparations. This combination effectively resulted in relevant changing and suture-to-incision time savings, Dr. Ramolla explains.

A bundle of optimizations has helped us make our surgical workflows more efficient and thus saved us time. For example, we were able to significantly improve the timing of the first suture in the morning by up to 15 minutes.

Success factors at a glance:

- ○ Early involvement of hospital management and departments
- ○ Implementation of strategic capacity planning
- ○ Performance standards with Torin OR management software and predefined settings
- ○ Resource management based on individual demands
- ○ More precise and reliable surgery planning with integration of perioperative process times
- ○ Accurate upstream and downstream process steps
- ○ Optimization and standardization of surgical workflows
- ○ In-depth integration at peripheral interfaces
- ○ Transparency and timely reporting
- ○ Digitalization of surgery documentation
- ○ Implementation of standardization concepts

"With Torin, we ensure streamlined information flow and significantly less impairments in our surgical workflows."

Important information, such as the need for a quick incision or a pacemaker that needs to be deactivated preoperatively, is documented in our Torin software before the surgery starts. During surgery, this enables our staff to be informed. Our improved flow of information has led to significantly fewer unnecessary process disruptions.

In parallel, we have implemented an OR room set-up concept with the aim to support our staff setting up operating tables and equipment under professional guidance in a quiet atmosphere. Our interdisciplinary teams are better coordinated, has less idle time, and are now trained for our processes. Our patients benefit from shorter waiting times, surgeries running according to schedule and a calm atmosphere, Dr. Ramolla continues.

Quo vadis OR management?

We are currently working on implementing Torin artificial intelligence into our surgery planning. With Torin AI, it will support improvement of the OR plan accuracy by providing AI-based prediction of our surgery times", Dr. Ramolla explains.

A study*** shows that accurately predicting duration of surgery is the most important factor for optimizing use of operating rooms. When calculating the surgery time based on documented data and context data, the surgery plan accuracy can be increased by 36%.

With this information in mind, we are launching into a new world of OR management, underlines Dr. Ramolla . Our aim now is to achieve even better utilization of core surgery hours and reduce overtime by ensuring a scheduled end-of-the-working-hours for our staff. In addition, it is going to be important to provide a high level of adherence to appointments for the patients.

We are now using Torin in our radiology department and we are working on implementing Torin in our internal medicine. We are also planning to integrate the Torin software with the sterile supply management solution to automatically trigger standard packing lists as well as availability checks of instrument trays and case carts, says Dr. Ramolla.

In the future, Torin will also support us in reducing material consumption. We are planning to inform patients automatically by SMS about appointments and provide online access to a patient portal. This enables us to share information such as preliminary test results, documents and detailed information about latest hospital stays and postoperative follow-up activities, Dr. Ramolla explains. During surgery, the documentation will be simplified by tools such as language assistance and artificial intelligence.

Todays OR management do not begin in the operation room, but rather at patient admission. Process optimization using AI and streamlining workflows does not only affect the surgical department, but all upstream and downstream workflows throughout the entire hospital. OR management require full integration in almost all areas of a holistic, cross-interface and multidisciplinary hospital workflow and must be supported by innovative digital solutions, Dr. Ramolla concludes.

*** Integrating Data Mining and Optimization Techniques on Surgery Scheduling - Carlos Gomes1,2, Bernardo Almada-Lobo1,3, Jos´ e Borges1,3, and Carlos Soares1

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