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GH de la Région de Mulhouse et Sud Alsace, France: Equipped with a State-of-the-Art Hybrid OR

A large-scale project jointly conducted by the management and the clinical teams of the Groupe Hospitalier de la Région de Mulhouse et Sud Alsace (Mulhouse and South Alsace Region Hospital Group), and supported by Philips.

With the evolution of technologies and clinical practices, the use of a Hybrid Operating Room (OR) is expanding in healthcare institutions globally and also in France. GHRMSA, a GHT (Territory Hospital Group) support institution, has a complete territorial cardiovascular patient care pathway that is undergoing significant reorganization and optimization to support business growth. As part of this institutional strategic project, GHRMSA wanted to continue its investment policy and acquire a Hybrid OR. Given the scale of the work, the impact on teams and the approved investment, this project needed a collaborative approach, involving all stakeholders in its management and implementation. Rooted in the treatment requirements of the population and built upon the hospital's healthcare offering, this institutional project has to meet the needs of patients and healthcare staff alike. To ensure its successful completion, GHRMSA chose Philips as a partner.

"Beyond the regulatory context that requires healthcare institutions to have a Hybrid OR by the end of the year in order to conduct cardiac surgery activities, our healthcare professionals had expressed a desire for our institution to have this state-of-the-art equipment and to be able to offer up-to-date, less invasive techniques to patients. Part of our institutional strategic project was also to catch up so that we can be more attractive to vascular surgeons, anesthesiologists and OR staff."

Ms. Corinne Krencker,
Chief Executive Officer of the Hospital Group

4 clinical specialties

will primarily use the hybrid operating room: Cardiac surgery, Vascular surgery, Interventional radiology and Interventional cardiology.

1 Why a Hybrid OR?

A fully fledged healthcare offering

A Hybrid OR enables image guided, minimal invasive surgical procedures. This type of OR enables the conversion of complicated conventional surgical procedures into minimal invasive procedures. All public teaching hospitals currently have a Hybrid OR, and increasingly, more of the other public hospitals are equipped with one of the other public hospitals are equipped with one. The corresponding global market has evolved considerably and was valued at 744 million dollars in 2018. It is estimated that it will reach a value of 1.8 billion dollars by 2026*. The Mulhouse and South Alsace Region Hospital Group (GHRMSA) is part of this trend. The Hybrid OR will primarily be used by four clinical specialties: Cardiac surgery, Vascular surgery, Interventional radiology & Interventional cardiology.

$744 million

The corresponding global market is experiencing a significant growth, valued at $744 million in 2018 and estimated to exceed $1.8 billion by 2026[1]. The Groupe Hospitalier de la Région de Mulhouse et Sud Alsace (GHRMSA) has not deviated from this trend.

"Philips provided us with the best response to our needs within our allocated budget," confirms Ms. Véronique Fouché-Noizet. In addition to the technological choice, adds GHRMSA's Director of Operations and Material Resources Division Coordinator, it was the more structured support provided to professionals in managing change that ended up convincing management to choose Philips.

Ms. Corinne Krencker,
Chief Executive Officer of the Hospital Group

Benefits and challenges of a Hybrid OR implementation

Quality and safety of patient care

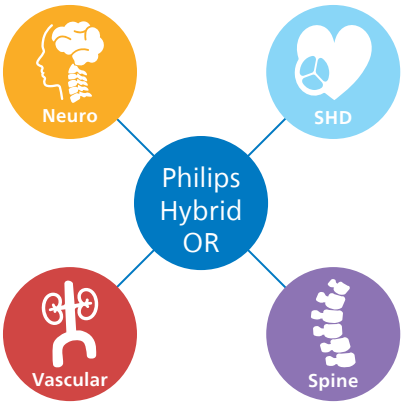
The use of a Hybrid OR, above all, meets challenges related to the quality and safety of care, explains Paul Baeumler, senior manager of the ARUBA (Anesthesia, Intensive Care, Emergency, ORs, Outpatient) division of GHRMSA. Less invasive and shorter, Hybrid procedures require fewer contrast media, expose patients to less radiation and carry a lower risk of complications. Recovery times and length of stay are shorter, helping to improve patient comfort. The safety of care is also optimized thanks to the stringent aseptic conditions associated with the OR, reducing the risk of infection, as well as the proximity of anesthesiologists. Ultimately, setting up this Hybrid OR contributes to improving patient care.

Paul Baeumler,
Senior manager of the ARUBA division of GHRMSA

Collaboration and friendly competition among teams
For medical and paramedical teams, the advantages of the Hybrid OR are equally numerous. By allowing a quick switch from a minimally invasive procedure to open surgery in case of complications it provides increased flexibility in planning and executing medical procedures. These Hybrid ORs also facilitate collaboration between different medical teams, bringing together specialists from various fields for complex procedures, and promoting friendly competition.

"On a professional level, working in a Hybrid OR provides enrichment opportunities for staff: surgeons are able to develop new treatment techniques by combining different approaches, and anesthesiologists and paramedical staff have the opportunity to collaborate with different physicians. This strengthens teamwork and, ultimately, fosters team loyalty."

Ms. Corinne Krencker, Chief Executive Officer of the Hospital Group



Expanding the patient population treated in the institution
Purchasing a Hybrid OR also comes with numerous benefits for an institution, such as the opportunity to treat more patients with the highest quality of care; indeed, by offering the ability to treat complex conditions with procedures such as Transcatheter Aortic Valve Implantation (TAVI), the Hybrid OR broadens the range of patient types that can be treated.

"Access to better quality imaging systems in a large enough room now makes it possible to treat patients requiring complex surgical procedures. For example, we can implant branched or fenestrated endoprostheses to treat abdominal or thoracic aortic aneurysms and to manage aortic dissections or post-traumatic aortic ruptures. We are also able to perform complex recanalizations for atheromatous disease of the iliac or gastrointestinal arteries, as well as carotid stenting, which requires great accuracy. These advancements allow us to welcome a wider range of patients to GHRMSA."

Dr. Bogdan Bratu, Vascular Surgeon at GHRMSA

Since minimally invasive procedures are also most often performed in an outpatient setting, length of stay is reduced, meaning beds can be made available more quickly.

"Another advantage is that we will be able to collaborate with private healthcare providers in the region whose cardiac activities are substantial, thus preventing patients from having to seek care in another region. This should therefore allow us to absorb the significantly increasing local demand."

Dr. Jean-Yves Wiedemann, Head of the Cardiology Department at GHRMSA

Finally, this substantial investment will have a highly positive impact on our image: not only in the eyes of patients, who are reassured that they are being treated in a hospital at the cutting edge of technology, but also in the eyes of healthcare professionals. It allows us to promote loyalty among those already with us, since they will be happy to work in a modern healthcare institution where they can offer innovative approaches, and to recruit new talent who will be attracted by such a prospect.

* Hybrid Operating Room Market Size, Share and Trends | Analysis - 2026 », Allied Market Research. https://www.alliedmarketresearch.com/hybrid-operating-room-market

2 Managing a Hybrid room implementation project in the OR department

A Hybrid OR project is an institutional strategic project supported by the hospital management and the medical staff, requiring the contribution of many stakeholders. It was therefore important to align and involve the different teams and different roles around this project.

From the institutional strategic project to the creation of a Hybrid OR

Project preparation and design phase

Setting up a multidisciplinary Hybrid OR presents a range of organizational and technical challenges, and accurately predicting these challenges is vital to the project's success. The first challenge to overcome when designing the Hybrid OR at GHRMSA was to clarify our needs: which types of procedures, requiring which types of specialists, will take place in this Hybrid OR? How should scheduling be organized for this new room and reorganized for the other ORs?
Is the institution able to commit to an investment of this scale and bear the associated operating costs? It was necessary to assess the impact that the creation of this room would have on existing cathlabs and on medical and paramedical human resources. It was also essential to visualize the operational flows (patient flow, the flow of medical staff, equipment and supplies, and finally the flow of emergencies) and to ensure that each stakeholder is able to work under the best conditions. By making a diagnosis of current activities through interviews with all stakeholders and through on-site observations of flows and inventory management, support from Philips has provided a solid foundation for modeling future activities thanks to the use of a Digital Twin*.

We have been able to reaffirm our decision through a visit to a public teaching hospital partner site with equivalent clinical activity that has a substantially similar Philips Hybrid OR. The project team then had to ensure technical feasibility: the Hybrid OR had to be set up in a pre-existing OR, which needed to be redesigned. Philips therefore worked to adapt its solution to the constraints of our institution. Checks had to be performed: these included checking that the air treatment system complied with the ISO5 standard, that the size of the OR allowed for the installation of Philips equipment and associated equipment, that the premises had adequate provisions (connection to various networks - gas, electricity, lighting -, cable length), and that installation of the ceiling-mounted system was possible. The provision of clinical teams was essential to refine the spatial installation and ergonomic use of the OR.

Structured internal project monitoring

To structure the project process, we appointed an institutional steering committee (COPIL), a project committee (COPROJ) bringing together key stakeholders, a medical and technical project manager and a biomedical engineer, in order to successfully complete the project:

- The role of the COPIL was to study the feasibility of the project in light of the constraints and risks, and to ensure its design (specifications, contracts, etc.) and then its implementation (directing the work, managing suppliers, controlling costs, etc.).
- The aims of the COPROJ were to establish an overview of existing activities, to create a forecast of the activities to be performed in the Hybrid OR and in other ORs impacted by the project, to assess, prepare and support the organization of the OR and cathlabs both on a human resources level and on a logistical level, and to implement effective communication about the project

* A virtual, statistically based, modelling and simulation methodology testing organisational scenarios of cathlabs and Hybrid OR, and their impact on capacity.

Management of the Hybrid OR project: operational implementation

Choice of equipment

In order to perform minimally invasive procedures, the Hybrid OR must be equipped with a medical imaging system that allows for the acquisition of high-definition images to provide real-time 2D and 3D image guidance. Various factors led our institution to choose the Philips Azurion 7M20 FlexArm, with a ceiling-mounted C-arm: this system facilitates biocleaning of the OR, frees up space for the various operators, particularly around the patient table, and produces full-body images from any angle thanks to its high level of flexibility. Finally, it can be parked away to create room above the patient.

This Hybrid OR is an integrated OR that includes a video-management system. Multiple screens are therefore strategically placed around the room. Using a simple tablet, users can therefore easily cast any video signal to any screen, depending on their position.

The Azurion system includes radiation dose reduction tools, to the benefit of users and patients: ClarityIQ designed to obtain a high-quality image at the lowest dose level. Zero dose positioning makes it possible to recall a baseline position without further image acquisition. Nonetheless, to reinforce the protection of our users, we have extended our range of ionizing radiation personal protective equipment (lead aprons and skirts, protection placed high up on mobile arms, goggles, etc.) and collective protective equipment (radiation protective screens, demarcation of radiation areas, etc.).

Heavy but limited work

The provision of equipment in the Hybrid OR was approved with the clinical teams following numerous work sessions in order to meet the needs of each stakeholder as closely as possible and to make operations as ergonomic as possible. A mock-up phase and co-creation workshops directed by Philips made it possible to set up control stations, adjust the dimensions of work surfaces and understand how the various flows are integrated into the OR and Hybrid room.

Since the Hybrid OR was installed in an OR dating from 2014, the work was limited to reinforcing the ceiling structure for installation of the C-arm. The storage space, shared by several specialties and designed prior to the work on the Hybrid OR, is being optimized with the creation of storage areas arranged by user specialty.

Change management support
The installation of the Hybrid room within the OR, which already has a well-defined organizational structure, raised a few worries and concerns which needed to be resolved. Supporting the clinical teams was one of the priorities, critical to the success of this project.

The creation of a working group helped to support professionals in understanding the challenges, particularly pertaining to human resources, to facilitate visualizing the new organizations and to assist with adapting to the space and the working environment. For a year, newsletters were distributed regularly to inform them of the progress of the work; site visits were scheduled; stand-up meetings, training and reflection time within the institution helped to strengthen interprofessional cooperation between different departments and teams. Organizational changes could be introduced, such as with the creation of the role of OR logistical coordinator to ensure a continuous connection between the radiology department, cathlabs and the OR.

Support from Philips also helped to facilitate and anticipate certain organizational elements, for example by holding meetings with teams from a partner public teaching hospital to share information and benefit from their feedback. 3D simulations provided by Philips made it possible to measure potential crowding in the room and to anticipate the future working conditions of healthcare professionals, and provided a good way for the various stakeholders to understand the project. Healthcare leadership teams were particularly involved in supporting the respective teams while promoting a department/specialty approach and cooperation between the interventional departments, hospital wards and administrative teams. This increased support was a key factor in the success of this project.

"We collaborated extensively with the various clinical teams required to work together in the Hybrid OR, so that we could understand their practices and positions in the OR and arrange the equipment accordingly."

Jocelyn Paul, Philips Project Manager

We predicted an estimated increase in activity of almost

22%

The creation of the Hybrid OR at GHRMSA marks a significant development in the evolution of medical practices and in the improvement of the quality of care offered to patients. This large- scale project is the result of a close collaboration between management, the clinical teams, the technical departments and the biomedical department of GHRMSA, as well as Philips, and reflects the institution's resolute commitment to meeting the challenges of quality and safety of care, supported by innovation.

Change management support

A medico-economic study
As with any large-scale medical project conducted within a healthcare institution, a medico-economic study made it possible to assess the cost and profitability of installing a Hybrid OR at GHRMSA. Initiated before launching the project, this will be conducted over several years.

"The study is not limited to the cost of acquiring the Hybrid OR and the income it should generate. Keeping 3 cathlabs in the interventional radiology department has led us to include other parameters, such as the need to find new revenue by expanding activities, and the costs related to transforming and adapting our capacity."

Ms. Fouché-Noizet,
Director of Operations and Material Resources Division Coordinator at GHRMSA

The decision to install a Hybrid OR in addition to the 3 cathlabs - not as a replacement for any of them - created additional costs associated with the purchasing of supplies and the redeployment of human resources; this additional cost must be covered by an increase in activity. "The acquisition of a Hybrid OR, which includes building work, biomedical equipment, accommodation and IT, etc., required an investment of over 2.7 million euro. We predicted an estimated increase in activity of almost 22% (vs 2022)," explains Ms. Fouché-Noizet. This project is part of a major restructuring of the entire cardiovascular care pathway and aims to support business growth. In this context, the objectives defined and co-created by the medical teams rely, on the one hand, on transforming activities, for example by emphasizing a shift to outpatient care and, on the other hand, on regaining market share. Alongside objectives determined by the number of hospital stays, performance targets were also set and involve in particular the IP-DMS (average length of stay performance indicator), the Hybrid OR and hospital bed occupation rate and, finally, monitoring access times for certain procedures.

"A return on investment is expected within less than 5 years."

The medico-economic steering of the Hybrid OR project continues as part of monitoring the objectives defined and shared with users from the specialties involved in the Interventional cardiovascular care pathway. Subannual monitoring is organized specifically for this project and the parties involved in the cardiovascular care pathway particularly as part of the dialogs between the management team and the medical activity divisions.

Beyond simply acquiring an innovative technology, this Hybrid OR embodies a holistic vision of clinical treatment, combining clinical expertise and state-of-the-art equipment to offer the highest quality care. By integrating the needs of patients and healthcare staff, this project illustrates the crucial importance of collaboration and of involving all stakeholders when it comes to transforming clinical practices.

Thanks to this Hybrid OR, GHRMSA has strengthened its position as a major healthcare institution in its region, in order to respond to the most complex medical challenges and to offer patients the highest quality of care.

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