Issue 2

Case Study Series

Radiology of the future

Patient experience project at Kantonsspital Baden City

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Introduction

Whether as an outpatient or inpatient, visiting the radiology department means leaving familiar surroundings and entering an often unfamiliar, high-tech world. Radiology departments are filled with technology, and patients know little about the equipment, examinations, and treatments. Performance pressure and staff shortages might also increase the risk of friction. In addition, patients usually only visit the department for a short time – often at a stage when they are vulnerable because of an unclear diagnosis. Fear and uncertainty might cause tension. Radiologists are therefore faced with the challenge of increasingly upgrading the social-interactive elements of their departments.

In 2020, the Beryl Institute reported that, besides health outcomes, the biggest influence on patient experience is basic *human interaction* "[Patient Experience is] the sum of all interactions shaped by an organization's culture that influence patient perceptions across the continuum of care." Jason A. Wolf, PhD, CPXP, – President of The Beryl Institute[1]

By using examples, our case study will show how patient experience can be enhanced in radiology. The patient, who plays the central role, will show us the way to the radiology of the future.

"Medical competence and smart technologies will not be sufficient anymore to fulfill patients' expectations – radiology of the future needs dedicated human interaction."

Prof. Rahel Kubik, Head of the Institute of Radiology, KSB

Contents

Project concept

Before we present the project in more detail, we would like to start with a conceptual outline. Figure 1 shows the key elements of a successful interaction and therefore a positive patient experience:

1. Competence
2. Organization
3. Information and communication
4. Well-being
5. Comfort

The basic assumption is that, during the continuum of care, patients constantly compare their perceptions against their expectations. The patient experience therefore begins with patient satisfaction. Based on Kano's customer satisfaction model[2], meeting basic requirements, such as providing of a correct diagnostic report, is no longer sufficient.[3] Just like retail customers, patients are willing to change their provider if their expectations are not met. They have many more needs, e.g., empathy, smooth processes, and "wow-effects". They are gradually taking for granted earlier innovations, such as online appointment scheduling. For this reason, decision-makers need to consider that not every service achieves the same degree of impact on the patient experience. Following Maslow's pyramid, basic requirements are considered routine, and comfort offerings are only valued when the basic requirements are met. This makes it increasingly difficult to implement the patient experience measures shown in Figure 1.

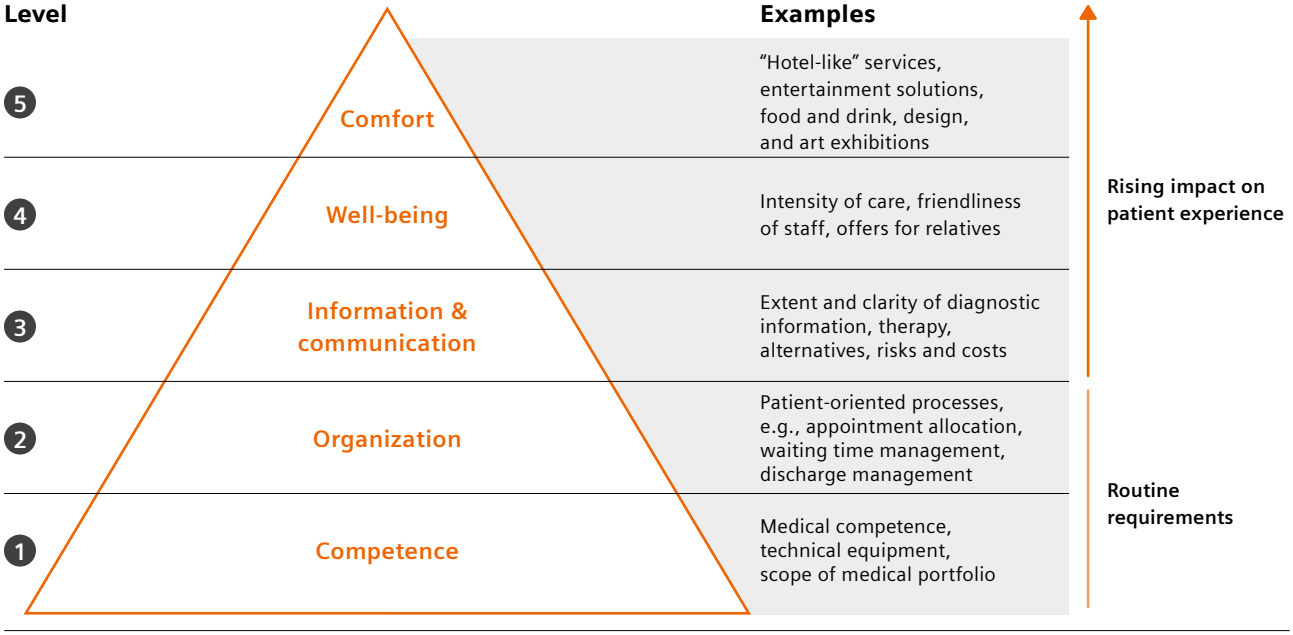

Figure 1: Pyramid of patient experience at Kantonsspital Baden City

While it may be difficult to influence the way patient expectations evolve, we can control the way we interact with patients. We interact with them not only during the examination, but also by creating a seamless organization (flow design), offering valuable information and well-being (service design), and creating smart spaces (facility design and a healing environment). For details, see Figure 2.

In addition to these three mediators, it will be increasingly important to create the patient experience in a sustainable and resource-efficient way. To fulfill their mission in the patient journeys of the future, radiology departments will therefore have to find solutions to reduce their ecological footprint.

"The three levers of flow, service, and facility design strive to improve not only the patient experience, but the employee experience as well."

Karl-Philipp Kienle, Collaboration Manager and Clinical Consultant, Siemens Healthineers

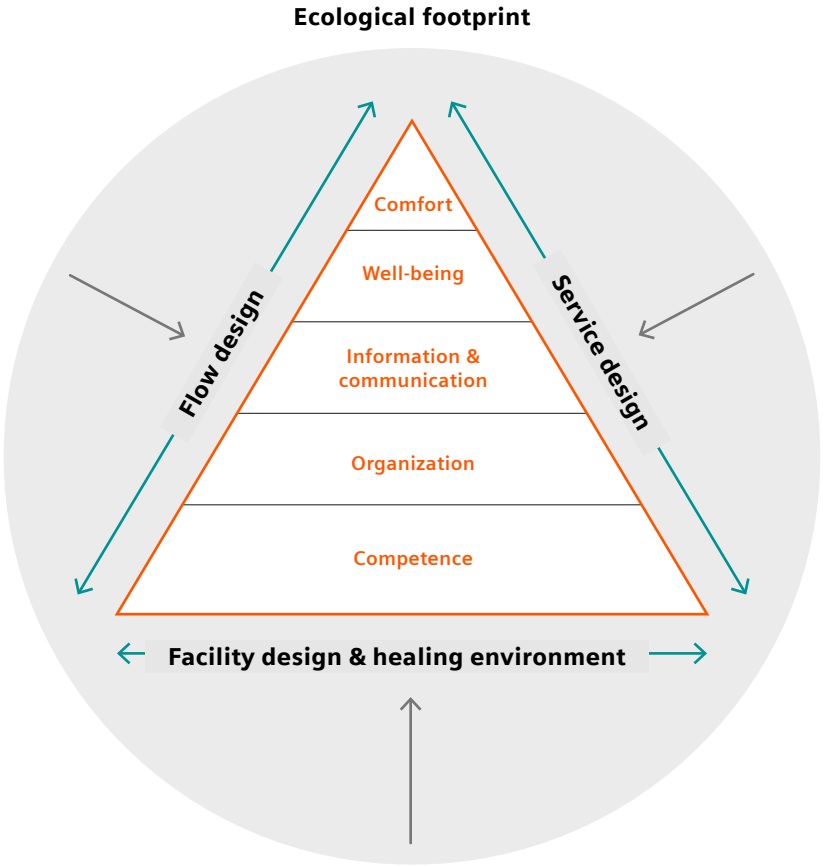

Figure 2: Mediators of patient experience at Kantonsspital Baden City

Case study

The key task for radiology leaders is to define the practical mediators of patient experience and understand the challenges of the different levels in the pyramid. The Kantonsspital Baden (KSB) has set itself the target of tracking the patient experience and addressing the challenges—thereby paving the way for the radiology of the future.

KSB is the central imaging provider in the east of the canton of Aargau in northern Switzerland. With five outpatient satellites and strong networks to regional providers and physicians, the Institute of Radiology is an essential diagnostics center, performing about 115,000 exams and imaging-assisted therapies yearly. Its 175 employees provide first-class imaging and interventions. However, the competitive environment is dynamic. Potential for innovation and partnerships emerges frequently. Therefore, shaping the radiology department of the future cannot wait—and it is important to grasp every opportunity.

"We relieve the project teams of coordination and communication tasks to turn long-cherished ideas into real added value."

Adeline Schlag, Management Consultant at Value Partners for Healthcare Consulting, Siemens Healthineers

The opening of KSB City in the summer of 2022 is one such opportunity. The new outpatient site right in the city center of Baden is designed to make examinations and treatments as pleasant as possible in the form of an all-round positive experience. The site's compact structures offer an ideal space for testing patient experience innovations, preparing new approaches, and adapting to changing patient needs.

As part of the Value Partnership[4], KSB's Institute of Radiology engaged Value Partners for Healthcare Consulting from Siemens Healthineers on a project to explore feasible patient experience initiatives and to drive these forward. As an enabler, the consulting team unburdened the project managers and provided structured coordination of the patient experience measures. In this way, new formats and offerings were implemented across the entire patient journey (Figure 3) in just a few months.

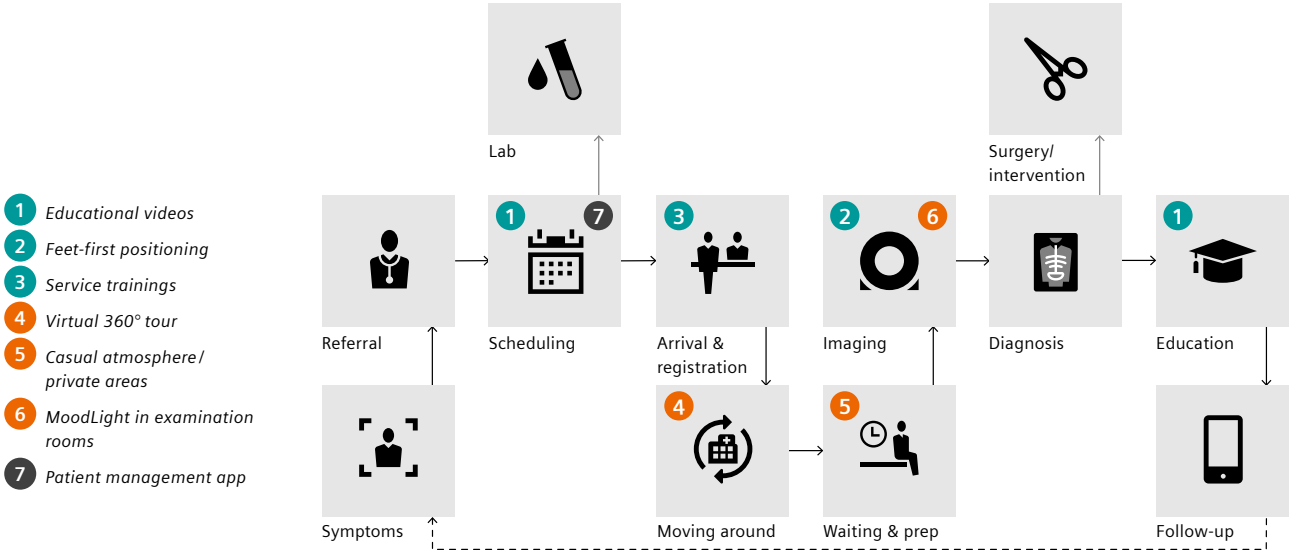

Figure 3: Patient experience examples along the patient journey at KSB City

Flow design

Flow experience is created when structures and processes are optimally intertwined. Smart and smooth operations are key. Based on patient satisfaction level 2 in the pyramid of patient experience, streamlined processes do not necessarily win patients' enthusiasm – they are usually taken for granted. In contrast, a slow and inconsistent flow has a high risk of causing frustration. Patients are therefore increasingly demanding intelligent solutions in clinical areas.

For many project ideas, a powerful catalyst is digitalization. New technologies influence positively the way we design processes. They enable us to reduce manual effort and to create a better flow experience for patients and staff. Together with startups, the KSB Health Innovation Hub is promoting the development of digital solutions that improve care, processes, and services for patients and staff. One major example is the cooperation with a start-up that develops a patient management app. The app helps patients keep track of their medical appointments and KSB can share specific educational material with the patient before the appointment. In this way, digitalization supports the flow of information between patients and staff. Especially for digitally confident patients, these types of smartphone-based solutions will noticeably upgrade processes and therefore enhance the sense of flow at KSB. By triggering patient satisfaction level 3 (information & communication), digital solutions are increasingly influencing the patient experience.

Figure 4: Educational video for a CT examination

Service design

In addition to impeccable expertise and smooth processes, KSB aims to achieve a holistic **service experience**. Education and imparting information play a very important role in patient interactions (patient satisfaction level 3). The aim is to convey the details of the diagnosis, examination, or treatment as comprehensibly and purposefully as possible. Most patients do not want to read through endless documents. Many look for catchier information on the internet and, depending on their digital skills, increasingly end up watching videos and listening to podcasts. Therefore, the KSB marketing team has expanded its toolbox to include educational videos that address these expectations and changing patient behavior. The short video format uses the power of storytelling and conveys the most important key messages to patients in a simple and entertaining way. Via the patient management app, KSB provides patients with a link to a relevant video before the appointment, creating access to dedicated content about each examination type (Figure 4). Educational videos also establish an emotional bond through their protagonists, emphasizing the aspect of human interaction. The radiology videos also serve as pilot videos for other communication purposes, e.g., for learning videos or for introducing other KSB medical services. KSB City's radiology is, therefore, already living up to its pioneering role.

At patient satisfaction level 4 (well-being), KSB emphasizes regular staff training. In training sessions and workshops, members of the team practice how to guide patients in a friendly and goal-oriented manner while establishing trust. In team meetings, they regularly discuss further improvement measures, e.g., for breast MRI. Since some patients suffer from claustrophobia, trusting patient relationships and direct communication are crucial. Staff also learn how to achieve the shortest possible scan times while ensuring high image quality. If needed, patients are offered a nasal spray for sedation and an accompanying person can be present in the scanner room during the examination. Recently, feet-first positioning on the scanner was implemented where possible, e.g., for breast MRI. Patients very much appreciate being able to face the control unit. Furthermore, KSB City has separate waiting zones for patients who need a more relaxing atmosphere, with coffee available and more privacy. Patient-oriented services promote a sense of well-being and a positive service experience at KSB City.

Facility design and healing environment

In addition to flow-supporting technologies and service-related innovations, KSB can also enhance the patient experience through a smart design of premises and infrastructure. According to both the patient satisfaction pyramid, and Maslow, basic requirements for a sense of safety and orientation must first be met. Therefore, **facility experience** also includes how patients can gain an impression of the building in advance. Linking up with this, the KSB team initiated the development of a virtual 360° tour of KSB City (Figure 5). With this solution, patients can virtually explore KSB City in a dollhouse-like digital application. Anchor points within the 3D images link directly to informational materials such as educational videos and interviews with the department's employees.

Layout design is one of the biggest challenges in health-care architecture. At KSB City, preparation rooms in the immediate vicinity of the CT and MRI rooms allow patients to have their IV lines placed in private. In the inpatient environment, i.e., more separate, and smaller rooms are also relevant for improved patient satisfaction. Patients do not like to talk about personal issues at the counter with a queue behind them. That's why KSB City's design concept includes small meeting rooms that give physicians space to have private explanatory discussions with patients before and after the examination. Furthermore, the indoor windows of the examination rooms have an automatic opacity function that offer a significant and easy to implement support for enhanced levels of privacy.

Figure 5: Virtual 360° tour of KSB City

Employees can see from the outside that a room is occupied, making unexpected walk-ins a thing of the past. These are just a few aspects, that make everyday life smoother while creating a closer and more reliable connection between patients and medical staff. Facility design therefore influences patient satisfaction levels 2 to 5 (organization, information & communication, well-being, and comfort).

Within milliseconds, we decide whether we feel comfortable in a room or not[5]. The sense of well-being (patient satisfaction level 4) and comfort (level 5) offered by healthcare facilities through their premises should not be underestimated. An increasingly significant concept that ties in with smart facility design is a **healing environment**. A healing environment embraces the idea that environmental stimuli with elements that are close to nature promote the healing process of patients and have a positive impact on the well-being of everyone [6].

To achieve positive effects in healing environment approaches, the architectual team at KSB assisted in the selection of furniture and lighting elements (see Figure 6). In addition to an attractive wood-effect floor, the Institute of Radiology deliberately chose seating with a playful look. Furthermore, the wall photos of landscapes from the local region of Baden convey a sense of familiarity and provide distraction before the examination. The images are backlit, creating a virtual window effect, which is perceived as soothing, especially in the examination rooms. Patients have a sense of well-being and comfort (patient satisfaction levels 4 and 5).

Figure 6: Waiting zone at KSB City

"This concept study developed in close coordination within our Value Partnership with KSB acts as a globally valuable pilot project."

Jana Petersik, Zone Business Lead Vascular Robotics and Clinical Consultant

Research shows that light can have a decisive influence on the well-being of patients.[7] Therefore, instead of glaring spotlights, indirect light is used at KSB City. Circular and wide ceiling lights add areas of warm light. In the examination rooms, staff can choose color tones to match the patients' taste. Staff can also dim the backlighting of the Baden photos, which means it is possible to respond even better to the needs of the patient. However, this principle is not limited to the rooms; it also features in the technology itself, e.g., in scanners with built-in illumination panels (MoodLight) for mammography in CT imaging or MRI. The MoodLight is an advanced feature for promoting patient satisfaction level 4 (well-being)[8].

In summary, the patient experience project at KSB City has added value in the form of several quick wins. It is now a matter of delivering this added value to the patient. It takes perseverance and discipline to not lose momentum. In addition, KSB City is prioritizing a sophisticated communication strategy so that the new patient experience offerings also gain awareness and are perceived as real differentiators by physicians and patients. By focusing on flow design, service design, and facility design, KSB City has addressed all levels of the patient satisfaction pyramid. The project team translated the concept of patient experience into tangible results (see Figure 7).

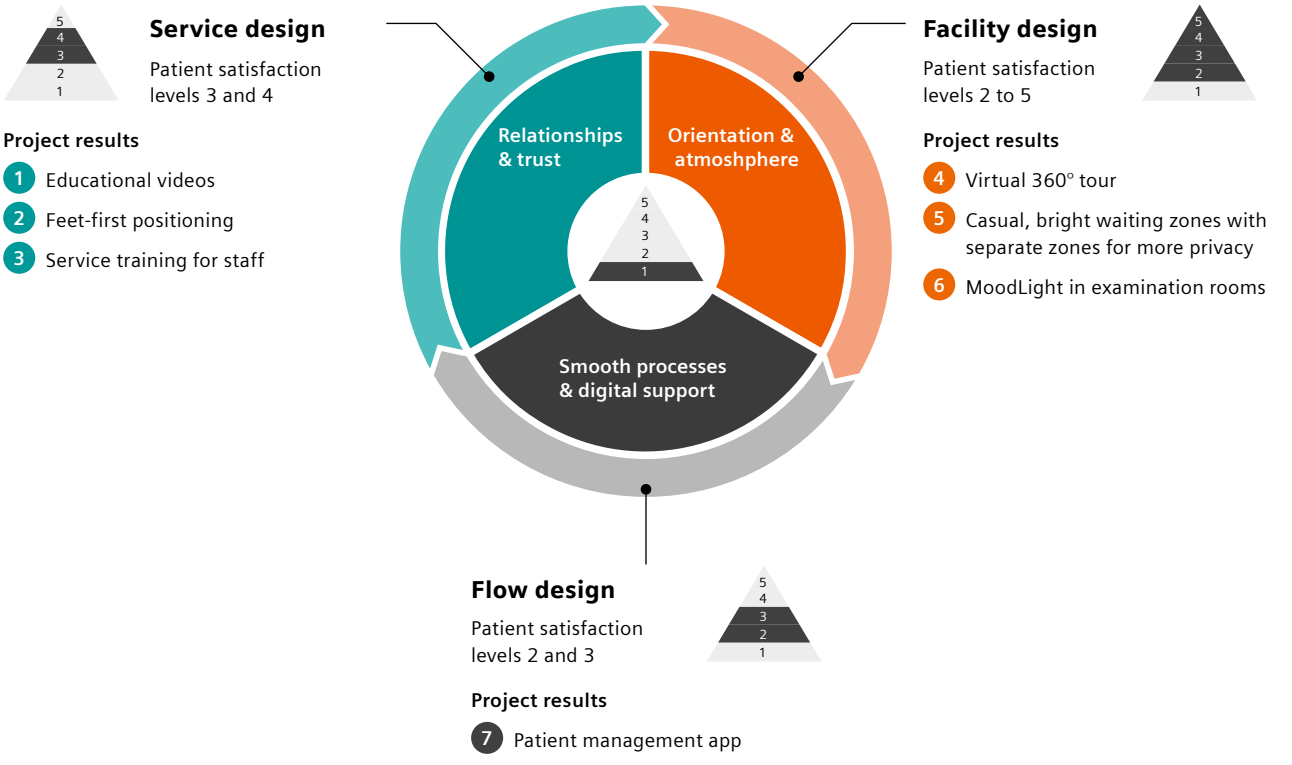

Figure 7: Patient experience project results at KSB City


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Outlook: Ecological awareness and value-based radiology

What seems innovative today, patients will take for granted tomorrow. In addition, new challenges and responsibilities are emerging. Managing one's own ecological footprint is becoming increasingly important. Radiologists should become aware of their elevated level of responsibility in this regard. As their discipline relies on critical raw materials, for example as helium, meaning leaders must also monitor sustainability and fairness in supply chains. Moreover, medical imaging needs a large amount of energy. At KSB City, the latest equipment provides optimal conditions for saving energy, but even with innovative functions such as the Eco-Power mode of MRI equipment from Siemens Healthineers, the modalities consume about as much as 20 family households per year.[9] This will make it even more important to optimize equipment use to keep per capita consumption at a minimum. In addition to energy-saving equipment, outpatient sites will play a major role. KSB City's central location near the train station means that patients can also use public transport to attend their examinations , which will reduce carbon emissions. Other measures include recycling patient clothing and using contrast agents sparingly. Therefore, the ecological footprint will be a limiting factor in the flow, service, and facility design of patient experience elements.

Moreover, demographic developments are creating a need to rethink financial concepts. In future, medical outcomes might be more important for reimbursements than volumes or case groups. Since diagnostics have a decisive influence on the patient pathway, leaders will increasingly deal with integrative value-based radiology approaches as discussed in the upcoming publication.[10] A holistic and, above all, positive patient experience is an essential prerequisite for such developments. Putting the patient at the center of these processes will have a positive impact on both human interaction and financial results.

These and other challenges of the future cannot be solved alone. Healthcare is constantly changing. Speed and complexity are increasing and a volatile, uncertain, complex and ambiguous (VUCA) world will affect the demands on healthcare providers.[11] Hence, the radiology of the future requires strong partnerships, strategic expertise and future-oriented technological investments. In this challenging environment, a positive patient experience embedded in a healing environment provide orientation by supporting decisions and focusing on what is essential – our patients.

Contact us for further insights and support.

"We strongly believe that a holistic approach to patient experience will also improve quality and thus outcomes in value-based radiology."

Prof. Rahel Kubik, Head of the Institute of Radiology, KSB

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Adeline Schlag
Management Consultant at Value Partners for Healthcare Consulting, Siemens Healthineers

Adeline Schlag has over ten years of experience in the healthcare sector, and particular expertise in digital project management. She holds a bachelor's degree in healthcare management and a master's degree in digital transformation from HHL Leipzig Graduate School of Management. As a consultant, she supports her clients in the development and implementation of smart and data-driven solutions that increase the decision-making quality, stakeholder value, and patient satisfaction including telematics and reporting tools, as well as digital applications and communication instruments in healthcare marketing.

Prof. Rahel Kubik
Head of the Institute of Radiology, KSB

Professor Rahel Kubik is Head of the Institute of Radiology, Chair of the Department of Medical Services, and a member of the executive board at Kantonsspital Baden in Switzerland, a teaching hospital affiliated with the University of Zurich and the Swiss Federal Institute of Technology (ETH Zurich). She trained at the Rockefeller University Hospital in New York and at University Hospital Zurich, and earned her medical degree, doctorate, and habilitation from the University of Zurich. She received a Master of Public Health (MPH). She has a strong interest in female imaging with expertise in all imaging modalities and image-guided minimally invasive breast interventions, as well as management topics and research.

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Karl-Philipp Kienle has been a clinical consultant and project lead for Value Partners for Healthcare Consulting since 2016. He is also a clinical collaboration manager for X-ray products. He has deep knowledge of pathway, process, and workflow optimization, and layout adaption. His expertise also lies in the field of clinical strategies and digitalization in the healthcare sector. Karl-Philipp is a medical doctor and trained in Erlangen, Berne and Boston. After completing his postdoctoral fellowship in Berne in 2013, he worked as a physician in the Ear, Nose, and Throat Department at University Hospital Würzburg.

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Jana Petersik joined Siemens Healthineers in 2019 as a Partner and Head of Global Practice Clinical Operations with Value Partners for Healthcare Consulting. Currently, Jana leads the Interventional Vascular Robotics business in Central Western Europe. Prior to joining Siemens Healthineers, Jana worked for TÜV NORD where she held a number of leadership positions including Lead Auditor for Quality Management Systems in Hospitals. Additionally, she was responsible for the development, implementation, and certification of quality and clinical risk management systems in hospitals and health systems in Germany. Jana has a degree in economics, specializing in healthcare and public sector management, from the University of Augsburg.

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Department Manager of Medical Services, KSB

René Heule is currently Department Manager of Medical Services at Kantonsspital Baden. He has financial responsibility in the areas of radiology, nuclear medicine, pathology, rheumatology, therapies, and the hospital pharmacy. Since 2008, he has been contributing his experience from industry, the public sector, and the transport sector in various functions in the healthcare sector. In 2007 he successfully completed the Executive Master of Finance at SMP St. Gallen. His focus is on the strategic development of hospitals, process optimization, and change and corporate management.

Adrian Schmitter
CEO Kantonsspital Baden AG

Adrian Schmitter has been CEO of Kantonsspital Baden for over seven years. He completed an engineering degree as an agronomist and studied law and economics at the Universities of Neuchâtel and Freiburg. During his career, he drove innovation in different positions in the healthcare sector. From 2001 to 2010 he was Secretary General of the Department of Health and Social Affairs in the Canton of Aargau, before continuing his career as CEO at Emmental Hospital. In addition to his function as CEO at Kantonsspital Baden, he has held and continues to hold several board memberships. His focus lies on implementing innovative ideas that ultimately serve society and patients.

List of Figures:

The products/features and/or service offerings (here mentioned) are not commercially available in all countries and/or for all modalities. If the services are not marketed in countries due to regulatory or other reasons, the service offering cannot be guaranteed. Please contact your local Siemens Healthineers organization for more details.
The results described herein by customers of Siemens Healthineers were achieved in the customer's unique setting. Since there is no "typical" hospital and many variables exist (e.g., hospital size, case mix, level of IT adoption), there can be no guarantee that other customers will achieve the same results.

The scientific overlay on the title is not that of the individual pictured and is not from a device of Siemens Healthineers. It was modified for better visualization.

[1] *The Beryl Institute. Defining Patient Experience [Internet]. Nashville, TN: The Beryl Institute [cited August 1, 2022]. Available from: https://www.theberylinstitute.org/page/DefiningPX*

[2] *The Kano model, also known as the "Customer Delight vs. Implementation Investment" approach, describes the relationship between the fulfillment of customer requirements and expected customer satisfaction. As an analysis tool, it enables users to understand how emotional responses to products, services, or features can be measured and explored. Materla T, Cudney EA. The application of Kano model in the healthcare industry: a systematic literature review. Total Quality Management & Business Excellence. 2017;660–681.*

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Published by Siemens Healthcare GmbH · Online · 14199 0923 · ©Siemens Healthcare GmbH, 2023