



Issue 3

Case Study Series

Radiology of the future

Encouraging patient empowerment for a personalized, value-based breast cancer pathway at Kantonsspital Baden (KSB), Switzerland

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Introduction

A change in the paradigm of healthcare

Value-Based Healthcare (VBH) is an important topic in today's healthcare transformation. In response to the steady increase in healthcare services worldwide and the resulting costs, a paradigm shift has gained importance in recent years. The individual health outcome of the patient is placed above the amount of health services provided, reducing unnecessary utilization. 'Value' in this context is defined as the outcome for the patient's health relative to the cost involved. In other words, 'value' is measured by the results achieved rather than the volume of services provided.

In a volume-based healthcare model focused on (short-term) spending, radiology has often been viewed as a 'cost center' rather than an intrinsic value creator. The diagnostic process, to which radiology makes a fundamental contribution, is not regarded as a value-adding outcome. Consequently, radiological societies such as the European Society of Radiology (ESR), the American College of Radiology (ACR) or the Radiology Society of North America (RSNA) claim to add Value-Based Radiology (VBR) as a necessary complement to existing VBH concepts. In this context, VBR refers to a healthcare delivery model providing high-quality radiology services that are effective, efficient, and patient-centered. It intends to both improve patient outcomes and increase patient satisfaction, while at the same time reducing healthcare costs.

Based on the example of the Breast Cancer pathway at KSB, this case study aims at demonstrating the holistic and multifaceted influence of radiology on patient health outcomes by positioning VBR as an integral part of the VBH framework. Using examples from daily practice, the article illustrates how value-based breast imaging can be successfully implemented in a radiology department.

This paper is the third part of the series "Radiology of the future"



Part 1:
Defining trends in
radiology and practical
examples of
implementation



Part 2:
Patient experience
project at Kantonsspital
Baden City

“Radiology is a key driver throughout the entire patient pathway as it holistically impacts individual patient outcomes at multiple levels. Therefore, it plays a fundamental role in any VBH model.”

Prof. Dr. Rahel Kubik, Head of the Department of Radiology at Kantonsspital Baden (KSB)

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Re-defining value in healthcare

In 2006, a game changing redefinition of healthcare value was proposed by Porter and Teisberg, moving from a purely monetary to a patient-centric definition. The central goal of healthcare should now be to maximize patient benefits while replacing the existing structure of reimbursement and measurement of healthcare. Optimized patient outcomes should thus be achieved in the most efficient way to reduce associated costs. As a result, the authors proposed the 'Value Equation' to measure the financial sustainability of healthcare delivery according to VBH¹.

In addition to defining 'value' in financial terms, 'outcome' is interpreted as the sum of 'quality' and 'service'. Consequently, these two metrics translate 'value' relative to 'costs' and provide a variety of new options for conducting VBH. Elements for better quality and a higher level of service can be actively influenced by each healthcare facility, on the one hand, and independently reduce costs on the other.

$$\text{Value} = \frac{\text{Outcomes}}{\text{Cost}}$$

Figure 1: Value equation to calculate financial sustainability

$$\underset{\text{(Value)}}{V} = \frac{\underset{\text{(Quality)}}{Q} + \underset{\text{(Service)}}{S}}{\underset{\text{(Cost)}}{\$}}$$

Figure 2: Adapted value equation to define value

"By embracing Value-Based Healthcare principles, radiology can contribute to moving to a value-driven system, where all investigations or interventions contribute positively to patient health and well-being."

James A. Brink, Professor of Radiology, Harvard Medical School

Radiology's unique contribution to value-based healthcare

In the following, we first provide a general description of crucial components for Value-Based Radiology (VBR). We then use the example of the breast cancer pathway at KSB to illustrate the selected combination of value-creating activities by emphasizing the role of medical imaging. Radiology plays a critical role in every patient pathway from medical diagnosis to treatment. Therefore, radiologists must adapt to current challenges in the healthcare sector by embracing the value-based approach. In VBR, radiology focuses on the contribution of imaging to patient outcomes while aiming both at minimizing costs and optimizing resource utilization.

In this model, the quality and value of imaging and image-guided interventions take precedence over the volume of imaging services provided. VBR's fundamental principles include the appropriate use of imaging tests, up-to-date infrastructure, minimization of unnecessary or redundant exams, and prevention of potential adverse effects linked to radiation exposure, image-guided interventions, or contrast agents.

VBR includes evidence-based guidelines into clinical decision-making, such as the BI-RADS classification system and other national and international guidelines for breast imaging.

The concept of VBR also emphasizes the importance of patient-centered care, shared decision-making, and communication between radiologists, referring physicians, and patients. Therefore, the integration of the radiologist into multidisciplinary care teams, as discussed below for the breast cancer pathway, is an important principle.

Finally, outcome measurements are gaining increasing importance. By collecting and analyzing data on patient outcomes, radiation dose exposure, and other relevant metrics, radiology departments can identify areas for continuous quality improvement to enhance the value of their services. This data-driven approach not only allows identifying areas for improvement and helps optimize patient care but also enables a radiology to demonstrate its contributions to healthcare stakeholders, such as patients and policymakers.

“Radiology is deeply embedded in the entire pathway of modern patient care and as such, needs to be recognized. With our passion at Siemens Healthineers, we continuously strive for the best technical solutions and work intensively on reducing costs in the individual patient workflow.”

André Hartung, President of Diagnostic Imaging at Siemens Healthineers

Case study

Encouraging patient empowerment for a personalized, value-based breast cancer pathway at Kantonsspital Baden (KSB), Switzerland

In a value-based and patient-centric environment, traditional departmental divisions are being replaced by multidisciplinary teams, leading to improved outcomes, better management of radiology procedures, and reduced costs for hospitals. This approach generates efficient value for patients, the economy, and society.

At the Interdisciplinary Breast Centre (IBC) in Kantonsspital Baden, a cohesive team of professionals, including gynecologists, radiologists, pathologists, (psycho) oncologists, breast surgeons, plastic surgeons, and radiotherapists, work together to address individual patient needs.

Through shared decision-making and comprehensive patient representation, this collaborative approach enhances care quality, resulting in faster treatment and recovery times. By embracing a multidisciplinary model and focusing on value-based care, IBC exemplifies the benefits of breaking down silos and fostering collaboration among healthcare professionals. This patient-centered approach improves the overall patient experience and promotes efficient resource allocation and cost-effective healthcare delivery.

The medical expertise is supplemented by state-of-the-art imaging devices consisting of mammography including tomosynthesis, breast ultrasound, MRI, PET/CT and

SPECT/CT. What's more, the latest methods of minimally invasive diagnostics are offered including tomosynthesis- or MRI-guided vacuum breast biopsies. Minimally invasive procedures have the potential to decrease the necessity for more invasive surgical interventions and enhance surgical planning, customized to the specific requirements of each patient. As a result, these procedures align with and contribute to the concept of value-based healthcare (VBH).

The IBC is certified according to the criteria of ISO 9001 and of the German Cancer Society and the German Society for Senology as well as the Swiss Cancer League and the Swiss Society for Senology. These quality standards ensure that the workflows are standardized, and processes are optimized.

"At KSB, we leverage the full potential of our multidisciplinary team's expertise from the very start. We care for our patients throughout the entire pathway, which allows us to adjust our treatment to each patient individually for maximum treatment success."

Prof. Dr. Cornelia Leo, Head of the Interdisciplinary Breast Center at Kantonsspital Baden (KSB)

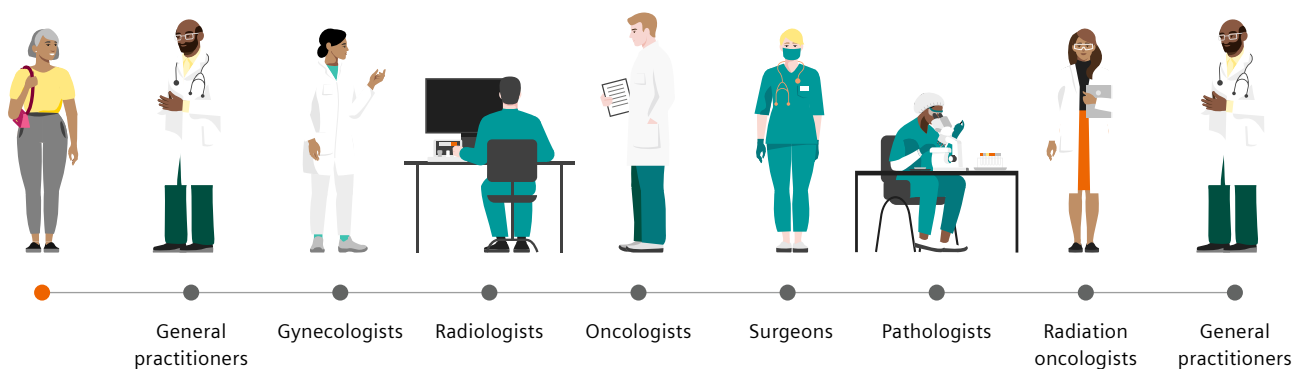


Figure 3: Radiologists' dovetailing with the various disciplines characterizes the value add of the Breast Cancer Pathway at KSB

Streamlined workflows for optimized efficiency

KSB offers women breast imaging at various locations: their main site, KSB City centrally located next to Baden's train station or decentralized in multiple geographically distant areas within the Canton Aargau. Each facility follows the same organ process standards, employs customized imaging protocols, utilizes teleradiology, has specialized personnel, and is equipped with state-of-the-art medical equipment, including various AI solutions.

Irrespective of the physical location, an integrated IT infrastructure ensures effective image distribution and streamlined processes, such as reading and analysis. With digital access to images and reports, physicians can avoid duplicate examinations and delays, resulting in cost and time savings.

Furthermore, the implementation of the most advanced infrastructure complements the value-based approach. For instance, digital breast tomosynthesis (DBT), a newer form of mammography that creates a three-dimensional image of the breast, can reduce the need for follow-up exams and biopsies, leading to fewer false-positive results and a higher probability of accurate diagnosis. Professor Kubik emphasizes, "for us, it is important to give certainty to our patients, using the best imaging techniques available to date." This commitment also includes protecting patients from unnecessary radiation exposure.

Optimizing imaging protocols for diagnostic accuracy

Radiologists closely collaborate with imaging technicians to optimize the imaging protocols, such as adjusting imaging parameters or selecting additional sequences, to suit the specific needs of each patient and obtain the required diagnostic information. Furthermore, FlexForce provides support in terms of tools, resources, and expertise to enhance the performance of the radiology department through an on-site workforce.

FlexForce Tech supplies licensed, and Siemens Healthineers trained technologists who support the radiology team in optimizing protocols and workflow, as well as maximizing patient throughput.

FlexForce Coach offers a highly experienced Siemens Healthineers trained application specialist to assess and continuously improve the skill level of team, sustainably enhancing the procedural scope and image quality.

This collaborative effort is facilitated by a technology partnership with Siemens Healthineers, enabling KSB to benefit from the latest work-in-progress (WIP) packages, which include cutting-edge algorithms that contribute to optimal imaging quality.

Applying international guidelines, yet personalized!

International guidelines like the BI-RADS lexicon are essential for breast imaging to standardize reporting and interpretation practices. They provide radiologists with a common language and framework, improve communication, and facilitate comparisons. While standardization is crucial, these guidelines also recognize the importance of individualized treatment decisions,

considering patient-specific factors. "For the diagnosis and treatment of breast cancer," explains Prof. Kubik, "it is of outmost importance to strike a balance between standardization and personalized care. We want to ensure at KSB that every patient receives the most appropriate and tailored management based on her unique circumstances".

Maximizing outcome through patient empowerment

Another important principle of VBH is empowering patients. Through questionnaires and patient dialogue, a radiologist can help select the best possible imaging modality and diagnostic examination tailored to the patient and to make an accurate diagnosis. Important information about the

patient e.g., past surgeries, scars, and breast prostheses can be gathered resulting in the prevention of unnecessary examinations. Dialogues not only build trust, but are also crucial for value-based, personalized healthcare.

Building trust, dismantling fear

An important step towards increasing value is listening to the patient first and building trust. Anxious patients tend to be less compliant, have poorer imaging results, and less understanding of the purpose of an exam. At KSB, brochures, website information, lectures, and even videos provide additional information on breast imaging. Additionally, the radiology expert attaches importance to a patient's emotions to reduce intensity and augment compliance for an accurate and timely diagnosis.

A welcoming clinical surrounding has a supplementary positive effect on the patient. Spring motifs like flowers, soothing colors, and separate waiting rooms can further contribute to making a woman feel comfortable during her stay at KSB's radiology department. "We have redesigned our waiting areas to create an atmosphere of well-being and health," explains Prof. Kubik. "To create a safe and trusting atmosphere, we have demarcated the waiting areas only for women of the Breast Center". Men are not allowed in this zone.

Enabling the choice

At KSB, when breast cancer is diagnosed, affected women are actively involved in the decision-making process. The state of research opens new possibilities for women who have been diagnosed with breast cancer. In earlier years, removal of the breast (mastectomy) was often considered a necessary practice.

Nowadays, minimally invasive biopsies guided by MRI, ultrasound, mammography or tomosynthesis can clarify the diagnosis of a suspicious finding and specify the subsequent surgical removal of the tumor.

"The radiological diagnosis forms the basis for an individualized, less invasive, treatment concept," explains Prof. Leo. Affected women who want to avoid the removal of the breast have many more choices today. "We listen to the patient and decide together what's the best way forward". Here the value-based approach lies in the active involvement of the patient in being able to make decisions regarding next treatment steps.

"Quality of care as one of the main pillars of value creation depends heavily on a precise, individualized, and integrated end-to-end cancer care. Through the close and smooth interconnection of all stakeholders and resources, KSB consistently enforces this value contribution in all processes."

Jana Petersik, Zone Business Lead Interventional Radiology & Cardiology CWE

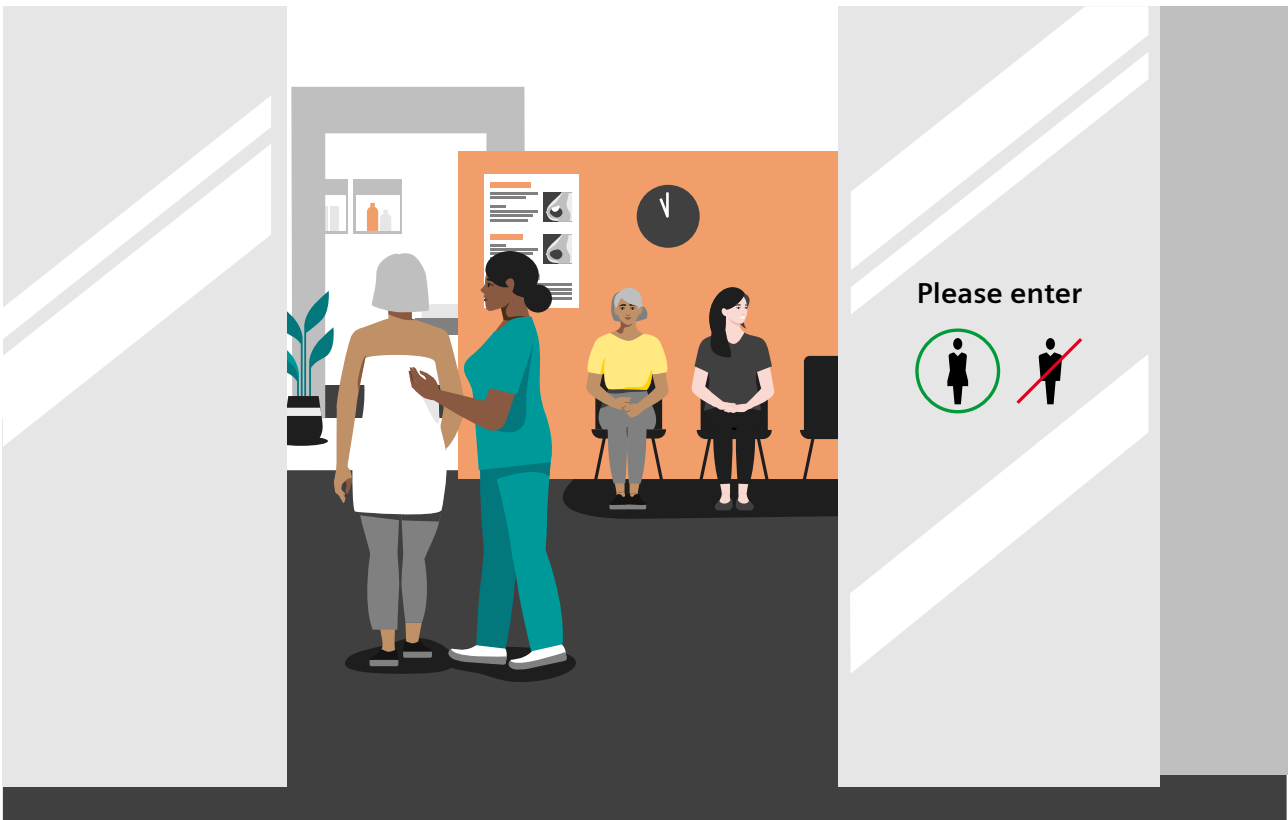


Figure 4: Waiting room with allowance just for women



Figure 5: New and modern mammography with a spring landscape and soothing colors at KSB City

Conclusion

With ongoing healthcare reforms, financial constraints, and increasing demand for value-based care, the importance of value-based radiology cannot be overstated in ensuring that radiology remains relevant and sustainable. By embracing value-based healthcare, radiology will contribute to improved patient outcomes, greater efficiency and improved healthcare overall – for the breast cancer pathway and beyond.



Figure 6: Breast Cancer Pathway offered for the patients at KSB

About the authors



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.



Prof. Dr. 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.



Prof. Dr. Cornelia Leo,
Head of the Interdisciplinary Breast Center, KSB

As a specialist in the diagnosis and therapy of breast cancer, Professor Dr. Cornelia Leo serves as the Head of the Interdisciplinary Breast Center at KSB in Switzerland. Her focus areas comprise minimally invasive breast biopsies, oncoplastic breast surgery, chemotherapy and targeted systemic therapies as well as genetic counseling for patients with familial breast and ovarian cancer. In addition to being a principal investigator in various clinical trials, Professor Leo conducts research on personalized breast cancer screening.



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Communications Manager,
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Dorothea is specialized in science journalism and corporate storytelling. She gained in-depth expertise in the journalistic work of broadcasting from experiences at Vatican Radio, among others. Previously, she had dedicated her academic career to analyzing media discourses while attending many international conferences and conducting interviews with a range of diplomats, journalists and leading figures in international relations during her PhD. Dorothea is currently driving employee and leadership communications at Enterprise Services (ES).



Jana Petersik
Zone Business Lead Interventional Radiology &
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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 Radiology & Cardiology 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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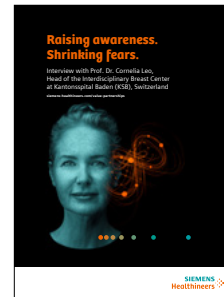
Lara Herzog has over six years of experience in management consulting and has joined Siemens Healthineers in 2021. Having worked in a multitude of consulting projects over the years, she brings in expertise in the areas of strategy development, transformation, process optimization, implementation and global roll outs as well as project management. In her current position, she focuses on the digital healthcare sector. Lara holds a master's degree in industrial engineering and management with focus on biomedical technology and health economics from the Technical University of Berlin.

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¹ Porter, Michael, Teisberg, Elizabeth (2006): *Redefining Health Care. Creating Value-based Competition on Results.* Harvard Business Press.



Raising awareness. Shrinking fears.

Learn more about the personalized, patient-centric breast cancer care at KSB in an interview with Prof. Dr. Cornelia Leo, Head of the Interdisciplinary Breast Center at KSB, Switzerland

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The outcomes achieved by the Siemens Healthineers customer described herein 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 others 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.

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