Healthcare transformation, we'll take you...

THERE

AGFA HealthCare

March 2013
Edition 14

8 **CENTRO DE ESPECIALIDADES MÉDICAS AMBULATORIAS (CEMA), MAR DEL PLATA, ARGENTINA**
New diagnostic center strengthens healthcare network and enables more effective care across municipality

14 **UC IRVINE HEALTH, ORANGE COUNTY, CALIFORNIA, USA**
Unique technology in ICIS 'connects the dots' between EHR and patient images

22 **CANISIUS-WILHELMINA ZIEKENHUIS, NIJMEGEN, THE NETHERLANDS**
CWZ Nijmegen goes beyond PACS vendor lock-in with new Vendor Neutral Archive

24 **ALLEGIANCE HEALTH, JACKSON, MICHIGAN, USA**
On-the-go bedside imaging brings better care to patients in ER and beyond

INTERVIEW INSIDE WITH:
» Charles Morris, Chris Magyar & Genady Knizhnik, ICIS Experts at Agfa HealthCare

Some things are meant to transcend borders

Anywhere in the world, the movements and rhythms of the tango are unmistakable: the steps, the precision and, above all, the perfect timing. It's a passionate dance, requiring discipline and a search for perfection.

ICIS, our Imaging Clinical Information System, translates those same demanding characteristics into the world of healthcare. It makes images readily available to the physician anywhere: across the department, enterprise, region, country, etc. By freeing medical images from the hospital's "information silos", by offering a way to capture, store, exchange and access these images directly through the EHR, ICIS gives them new meaning and perspective. And provides caregivers with seamless access to the patient's imaging history, with as much precision and smoothness as a meticulously executed tango.

With solutions like ICIS, Agfa HealthCare continues to play an important role in the changing healthcare world, which is always reaching farther, beyond yesterday's limits and limitations. This evolution is like a dance itself, using passion to take a new, expanded perspective on each step and movement, creating new meaning.

Inside this edition of THERE, you will find examples of how our own meaningful passion is helping transform healthcare, in real-life stories and interviews from healthcare enterprises. In radiology as well as at the enterprise level, our solutions support physicians and hospitals to make better-informed decisions.

Under the umbrella theme of *Insight. Delivered.* we will demonstrate at ECR 2013 how all our solutions help improve the delivery of patient care and collaboration across the department, hospital and region, underlining our promise: **"Leave no image behind."**

Enjoy!

MARC DE FRÉ
Director Marketing Communications

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4 MÁXIMA MEDISCH CENTRUM, EINDHOVEN, THE NETHERLANDS
Máxima Medisch Centrum buys peace of mind for the next decade

6 PIUS HOSPITAL OLDENBURG, GERMANY
Wireless detector helps hospital address efficiency goals

8 CENTRO DE ESPECIALIDADES MÉDICAS AMBULATORIAS (CEMA), MAR DEL PLATA, ARGENTINA
New diagnostic center strengthens healthcare network and enables more effective care across municipality

12 AMC HOSPITAL, AMSTERDAM, THE NETHERLANDS
Global Remote Incident Prevention services bring peace of mind to radiology department

14 UC IRVINE HEALTH, ORANGE COUNTY, CALIFORNIA, USA
Unique technology in ICIS 'connects the dots' between EHR and patient images

16 ENVISION YOUR EHR WITH IMAGING USING ICIS

19 NORWEGIAN RADIUM HOSPITAL, OSLO, NORWAY
Helping multi-disciplinary teams work together more efficiently

22 CANISIUS-WILHELMINA ZIEKENHUIS, NIJMEGEN, THE NETHERLANDS
CWZ Nijmegen goes beyond PACS vendor lock-in with new Vendor Neutral Archive

24 ALLEGIANCE HEALTH, JACKSON, MICHIGAN, USA
On-the-go bedside imaging brings better care to patients in ER and beyond

27 AZ SINT-REMBERT, BELGIUM
"IMPAX Agility is my office and I take it anywhere I want to work"

30 TECHNOLOGY CORNER
Agfa HealthCare introduces the benefits of task-based workflow engines to medical imaging

On the cover of this edition of THERE magazine:

Interpreted the world over, the tango has built a cultural heritage all its own. Blending precision with poetry, the dance is here performed in the old city of Split, Croatia – the perfect setting for one of the world's most imaginative dances.

© Katerina Bodrunova

DEFYING EXPECTATIONS

Russian artist Katerina Bodrunova explores the nature of physics in Underwater Tango, a spectacular series of photographs depicting an underwater dance performance. Transcending space, time and gravity, these dreamlike images offer a compelling visual interpretation.

MÁXIMA MEDISCH CENTRUM, EINDHOVEN, THE NETHERLANDS

Máxima Medisch Centrum buys peace of mind for the next decade

Rigorous tender involving all stakeholders translates global vision into smart long-term relationship

INTERVIEWEES Jac Verbruggen, Purchase Manager · Jef Pluijmen, Radiology Manager · Robert Waterschoot, Functional Application Manager

When Máxima Medisch Centrum, The Netherlands, decided to replace its RIS/PACS, it wanted the best of all worlds: to acquire the most current, appealing features from as many of the shortlisted vendors as possible. After a thorough review, they signed a contract for Agfa HealthCare's IMPAX 6 solution covering radiology, cardiology, nuclear medicine; IMPAX Data Center; and IMPAX Business Intelligence including long-term Managed Services with Global Remote Incident Prevention. It is peace of mind for at least ten years, they say.

Máxima Medisch Centrum has two sites in the south of The Netherlands (Veldhoven and Eindhoven) totaling 595 beds. Its 3,300 staff members, including 210 specialists, care for about 25,000 inpatients each year. The medical center is committed to implementing a hospital-wide imaging solution with high-end connectivity to other hospitals.

After thorough preparation for several years, a project team consisting of radiology and purchase departments launched a tender to upgrade the facility's RIS/PACS, and cover cardiology and nuclear medicine as well. Purchase Manager Jac Verbruggen: "The project group consisted of the functional application manager of radiology, the manager of clinical physics, the purchase manager and the radiology manager. In the course of the process, this steering group was advised by clinical specialists, ICT and radiologic technologists. We wanted a future-proof solution, so we involved all stakeholders in the hospital."

The need to replace the existing PACS infrastructure had been clear for several years. "We visited numerous important exhibitions in Europe to fine-tune the tender and establish our short list of vendors," says Jef Pluijmen, Radiology Manager. "This was a 'field reconnaissance' phase, which allowed us to define the vendors with whom we wanted to move into the purchasing process."

STRINGENT REQUIREMENTS LEAD PROJECT TEAM TO AGFA HEALTHCARE

The team eventually ended up with a shortlist of five and a very long list of requirements. Says Jac Verbruggen: "We were quite thorough in our demands as we wanted to safeguard the existing functionalities and add all the attractive features from the different vendors. Our research taught us that all vendors had their own approach to PACS and their growth path for it."

Eventually, the team's choice was Agfa HealthCare including its IMPAX 6, IMPAX for Cardiology, IMPAX for Nuclear Medicine, IMPAX Data Center and IMPAX Business Intelligence. IMPAX 6 is the latest version of Agfa HealthCare's proven image and information management solution. IMPAX for Nuclear Medicine delivers the benefits of integrated care to the nuclear medicine department and supports the patient's entire exam flow, while IMPAX for Cardiology enables patient-centric cardiac management with all the relevant data promptly available. The decision

"We wanted a future-proof solution, so we involved all stakeholders in the hospital."

JAC VERBRUGGEN, Purchase Manager

"Agfa HealthCare came with a smart deal for both of us."

JEF PLUIJMEN, Radiology Manager

also involves a 'smart' Managed Services contract and GRIP (Global Remote Incident Prevention), Agfa HealthCare's remote monitoring and event management solution for PACS and IT infrastructure.

SCALABLE SOLUTION WILL EXPAND PACS INTO WIDE RANGE OF SPECIALTY DEPARTMENTS

"We proved that Agfa HealthCare was the most suitable vendor to stabilize and extend our existing functionality and workflow. But they can also guide our growth towards a wider PACS solution, which includes nuclear medicine, cardiology, oral surgery and medical photography," explains Robert Waterschoot, Functional Application Manager. "We also considered expanding towards a hospital-wide PACS solution, but we first needed to quickly offer one single viewer, integrated into the Electronic Health Record, so medical specialists could access all images made and stored in the two different PACS within Máxima Medisch Centrum. Another goal is the efficient sharing of images with outside third parties."

"We found Agfa HealthCare to be the best in supporting our ambition. They make it possible for us to grow towards the implementation of a hospital-wide PACS solution using a single viewer."

ROBERT WATERSCHOOT, Functional Application Manager

The key to the solution is IMPAX Data Center, Agfa HealthCare's scalable enterprise imaging management solution, which can store imaging data from multiple departmental imaging systems and disparate hospital PACS solutions. IMPAX Data Center will allow doctors at Máxima Medisch Centrum to view images from radiology, cardiology and nuclear medicine from a single viewer, thereby increasing productivity.

SERVICE AND BUDGET IN LINE WITH HOSPITAL'S VISION

"Functionality, workflow and Agfa HealthCare's technical dimensions were excellent," Jef Pluijmen continues. "They supported our vision on making workflows efficient, as well as how to expand the solution to the complete organization. They also offered an outstanding service organization that's close to us, with a budget that met our needs."

During the pre-tender discussions, Agfa HealthCare introduced its Managed Services concept, with its Global Remote Incident Prevention functionality. The steering team decided to include Managed Services as part of the list of requirements. Says Jef Pluijmen: "Agfa HealthCare came with a smart deal for both of us: we would invest in our infrastructure, but we would have a contract that includes permanent technology updates to keep our solutions state-of-the-art for as long as we continue the relationship. We realized this Managed Services concept would provide us with peace of mind for at least a decade. Even with the equipment completely on-premise, we are assured of minimum downtime, and we don't have to continually invest in technology upgrades to prevent our system from becoming obsolete." •

AGFA HEALTHCARE'S CONTRIBUTION

» Solutions that meet the needs of today, while laying the foundation for expansion
» Comprehensive Managed Services concept that keeps solutions current
» In-depth knowledge of workflows and hospital information management needs

SOLUTIONS

» IMPAX 6 RIS/PACS, IMPAX for Cardiology, IMPAX for Nuclear Medicine, IMPAX Data Center and IMPAX Business Intelligence
» Managed Services contract including Global Remote Incident Prevention (GRIP)

DID YOU KNOW...

» Máxima Medisch Centrum's very existence is closely related to the multinational concern Philips. Philips' early 20th century growth led to the 1933 creation of a hospital site close to the company, thanks to an initiative by Dr. Anton Philips. This is still the location of the hospital's facility at Eindhoven.

PIUS HOSPITAL OLDENBURG, GERMANY

Wireless detector helps hospital address efficiency goals

Small device delivers big benefits including cost savings, seamless integration into workflow and sharing options for flexible use

INTERVIEWEES Priv.-Doz. Dr. Alexander Kluge, Director of the Institute for Diagnostic and Interventional Radiology · Jutta Juilfs, Head Technologist

> "Our staff is very satisfied with this detector, they appreciate the quality of the images as well as the significant workflow improvements."
>
> PRIV.-DOZ. DR. ALEXANDER KLUGE, Director of the Institute for Diagnostic and Interventional Radiology

Pius Hospital, located in the northeast region of Germany, serves a wide geographical area, providing both general medical services and highly specialized expertise. Over the last 10 years, Pius Hospital has gone through a process of complete refurbishment, including the hospital building as well as its medical technology. The introduction of a DX-D Retrofit solution fits into the hospital's goal of streamlining processes across the facility, especially in the ER.

The 400-bed hospital's major focus is on oncology, and it offers centers dedicated to breast, lung, colon and pancreatic carcinomas. Because of these specialty centers, the hospital performs more imaging and pathology exams than other hospitals of this size, which means productivity is paramount. Advanced imaging technology and PACS play a key role here in creating an efficient workflow for physicians' reports and study comparisons, and enabling a smooth interchange with clinical departments and referring physicians.

Previously, a cassette-based imaging system was in place, used for mammography and in the emergency department. "We decided to upgrade from imaging cassettes to a wireless detector, which would make workflows more convenient and faster, and also save on cassette costs," says Dr. Alexander Kluge, Director of the Institute for Diagnostic and Interventional Radiology.

The DX-D Retrofit solution allows healthcare facilities to upgrade to the benefits of Direct Radiography, without having to replace their existing equipment. The solution consists of a flat panel detector, a retrofit box and an NX workstation with Agfa HealthCare's gold standard MUSICA^2 image processing software, which provides excellent contrast detail and exam-independent, consistent image quality.

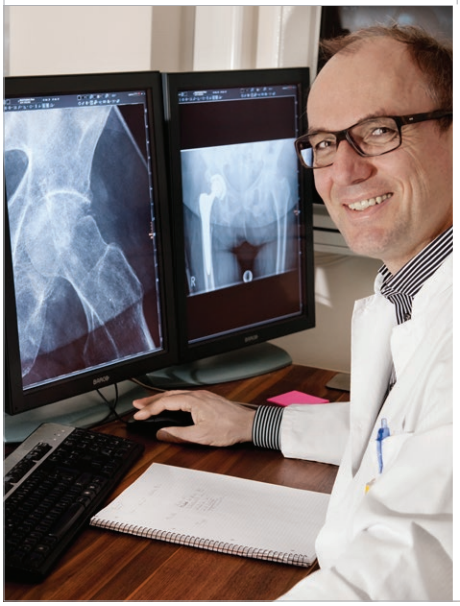
FAMILIARITY WITH AGFA HEALTHCARE SOLUTIONS, INTERFACES AND IMAGE QUALITY

Hospital staff were already familiar with imaging solutions and user interfaces from Agfa HealthCare, having worked with them for many years. After analyzing DR detectors in the market with regard to image quality, workflow and cost, Pius Hospital decided in favour of the WLAN-enabled DX-D Retrofit. "This solution has the added benefit of not requiring any significant training for our staff," explains Dr. Alexander Kluge. "Software and interfaces are from a single source, which is a great plus."

"Since September 2012, we've used the DX-D Retrofit to perform exams on approximately 30 patients daily on weekdays, and approximately 10-15 patients during weekends," says Head Technologist Jutta Juilfs. These patients had to be examined in a very short amount of time. Therefore, quick turnaround was a requirement. "The detector has significantly reduced staff workload for each patient."

Because it is wireless, the DX-D Retrofit offers enhanced flexibility. Demographic data is automatically fed to the detector from the PACS, and acquired images are transmitted directly onto the detector, streamlining workflow and speed of exams. Within seconds after the acquisition, technologists can pre-check the image, approve the technical quality, and transmit it wirelessly to the PACS. The detector fits into any standard bucky tray, and can be used in multiple X-ray modalities, meaning it can be shared among several rooms or modalities as needed, maximizing efficiency and keeping costs low.

As part of the re-organization, the CR system from Agfa HealthCare that was already in place was moved from the ER to the radiology department to be used for mammography, and to provide backup to the department. Featuring a team of 25 radiologists and technologists, the department carries out approximately 40,000 exams annually, including X-ray, 64-slice CT, MRI, high-end ultrasound, as well as mammography exams. Radiologists also work with PET/CT in the nuclear medicine department, and provide services for the ER, ICU, and the intermediate care department.



TECHNOLOGY INVESTMENT KEY TO HOSPITAL'S POSITIONING IN MARKET

"Investing in an infrastructure of advanced medical technology is a strategy fostered by our CEO, who clearly sees the necessity for this in the context of our positioning in the market. Our staff and our technology stand for diagnostic and therapeutic competence in complex cases," says Dr. Kluge.

In working with the DX-D Retrofit, radiologists at Pius Hospital typically aim to reduce dose by approximately 20 to 30 percent. "Our staff is very satisfied with this detector, they appreciate the quality of the images as well as the significant workflow improvements," states Dr. Kluge. Agfa HealthCare has been very responsive in regard to questions and with support, he says. "Patients profit from the investment by reduced queuing and more time spent with them by technologists," adds Jutta Juilfs.

INVESTMENTS THAT PROVIDE IMAGE QUALITY AND WORKFLOW IMPROVEMENTS NOW AND INTO THE FUTURE

Both the CR solution and the wireless detector technologies are economically forward-thinking investments, concludes Dr. Kluge. "DR detectors require a certain minimum number of exams to make sense financially, based on resource economies and productivity. In Oldenburg, a city with three hospitals providing in-patient care, Pius Hospital is well-positioned with its general scope, plus its focused expertise on oncology," he says. "Innovative, and still affordable, medical technology supports us in managing this mix of patients, which includes many complex cases, by providing advanced image quality and enabling swift turnaround times. The DX-D Retrofit is an excellent illustration of a solution which supports our goals." •

"Patients profit from the investment by reduced queuing and more time spent with them by technologists."

JUTTA JUILFS, Head Technologist

SOLUTION

DX-D Retrofit

- Offers the workflow and image quality benefits of DR
- Easy and quick to set up
- Wireless for enhanced flexibility
- Seamlessly connects to HIS, RIS, and PACS
- Single detector can be shared across different rooms, different modalities, maximizing efficiency and reducing equipment costs

AGFA HEALTHCARE'S CONTRIBUTION

- Enables cost savings and efficiency improvements
- Makes workflows more convenient and productive with technology that fits in seamlessly at all steps in the workflow process
- Develops technology that improves staff and patient satisfaction

DID YOU KNOW...

- Founded in 1871 as a charitable refuge for the poor, Pius Hospital has grown into an acute-care hospital with more than 400 beds, 1,000 employees, and 13 specialty departments.
- The European Medical School, newly established by Oldenburg University, integrates Pius Hospital as well as the two other hospitals in Oldenburg and local care providers into its research and teaching activities.

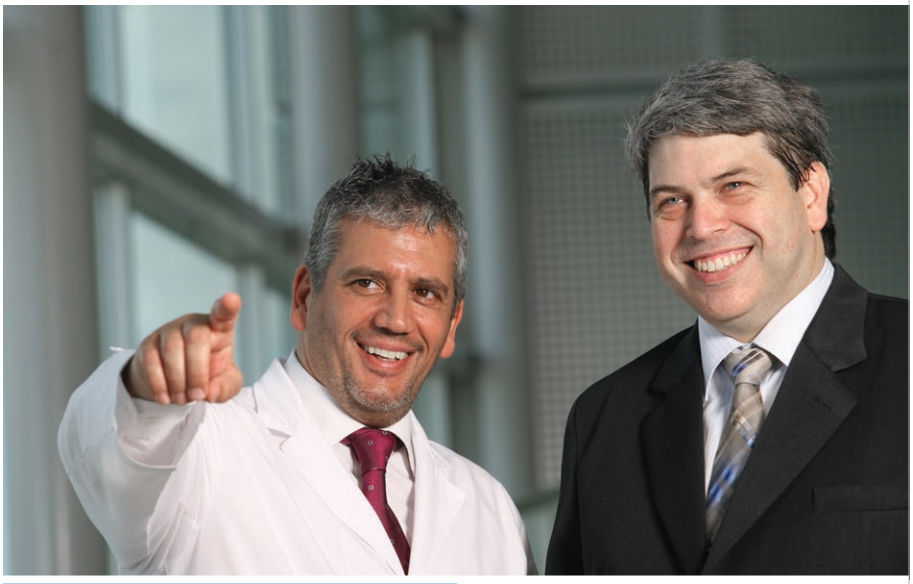
CENTRO DE ESPECIALIDADES MÉDICAS AMBULATORIAS (CEMA), MAR DEL PLATA, ARGENTINA

New diagnostic center strengthens healthcare network and enables more effective care across municipality

Completely digital approach aligns with government's aim to evolve towards preventive healthcare

INTERVIEWEES Dr. Alejandro Cristaldi, General Manager · Germán Giles, Medical Technology Director

Unlike other health service models in Argentina, the Centro de Especialidades Médicas Ambulatorias (CEMA, Center of Specialized Ambulatory Medicine) was designed to be completely digital, right from the start. The objective for CEMA was to support the 32 Centers of Primary Healthcare of the General Pueyrredón Municipality, along with two provincial hospitals. Through its specialized diagnostic technology and healthcare professionals, CEMA serves as a key link between the first and third levels of the healthcare system, optimizing healthcare in the public sector.



The city of Mar del Plata, Argentina's most important tourist center, is located on the Atlantic coast, about 400 kilometers south of the capital, Buenos Aires. CEMA, the area's newest and most technologically-advanced diagnostic center, opened its doors there in late 2012. Designed to provide medium- and high-complexity diagnostics to inhabitants of the region, CEMA will serve up to 1,500 patients per day.

> "Our completely digital site is perceived as a benchmark for healthcare in Latin America."
>
> DR. ALEJANDRO CRISTALDI, General Manager

This state-of-the-art facility features the latest ecologically-sustainable building materials and systems, and was funded by Argentina's national and provincial governments. Dr. Alejandro Cristaldi is General Manager of CEMA, and also Undersecretary of Municipal Health. "This project, included in the municipal healthcare system, was designed by mayor Gustavo Pulti, and Dr. Alejandro Ferro, Secretary of Municipal Health. We are very pleased with the building's design," he says, of the 6,200 square meter, three-storey purpose-built center. "But I always say that CEMA's main asset is its informatics profile."

SHAPING THE PROJECT PROFILE

Once Agfa HealthCare was awarded the contract, it helped to shape that project profile from the earliest stages of implementation. Local government administrators turned to Agfa HealthCare experts to help define the technology and workflow requirements. "The local team from Agfa HealthCare was of inestimable value during the process of the project, as they offered different types of specialized knowledge to help identify the specific needs," says Germán Giles, Medical Technology Director at CEMA.

Most of the examinations performed at CEMA are in the areas of CT, MRI, X-ray, ultrasound, echocardiography, and mammography. Patients are referred by physicians at any of the 32 primary healthcare centers in the municipality, which could be up to 30 kilometers away. Before CEMA, there were only four centers in this system providing

conventional radiology. Now, there are seven centers in the network providing digital radiology, around the clock, and the images from these health centers are read in real-time by the radiologists at CEMA.

DIGITAL PATIENT RECORDS IMPROVE SECURITY AND MINIMIZE DUPLICATION

The changes in the way healthcare is managed in the municipality go way beyond this improved use of radiology resources. Before CEMA started operations, all patient information for the municipality was handled on paper, including medical records, radiology films, etc. Now, this information is managed digitally. Once the patient is checked in, the system receives their demographics and personal details, so there is no need to transcribe the patient's personal information or re-perform imaging studies, improving patient security and minimizing exam duplication.

"The digital solutions from Agfa HealthCare play a central role at the center, helping us to meet our goals for high-quality diagnostics and for connectivity," says Germán Giles. The center uses a range of CR solutions from Agfa HealthCare, including the CR 30-X, CR 35-X and CR 85-X. It started with CR to be able to use the analog radiology equipment in place in the primary healthcare centers, and also because CEMA received some analog

> "The digital solutions from Agfa HealthCare play a central role at the center, helping us to meet our goals for high-quality diagnostics and for connectivity."
>
> GERMÁN GILES, Medical Technology Director

mammography equipment as a donation from the Buenos Aires province. Radiology workflow is managed with an IMPAX RIS/PACS solution, and the center also uses iPlan, Agfa HealthCare's internet-based enterprise scheduling and planning solution.

TECHNOLOGY TO ENABLE PREVENTIVE HEALTHCARE

In addition to all of the efficiency improvements that the technology enables, there are also important gains being made in the area of preventive healthcare. The network makes the solutions more widely available, and it also grants access to a wider professional offer. Day by day, as the project grows, physicians, technologists, and administrative staff are being added to the network.

This is making a significant impact on the health of the population. Because they have access to more equipment and professional expertise, diseases may be diagnosed faster. Healthcare providers are working with health protocols that determine what studies are needed, and how to make the best use of the facilities and all the solutions both in the CEMA and the health centers. "This is generating a major cultural change, not only from the technology point of view, but also on the medical side by standardizing processes of patient care," says Dr. Alejandro Cristaldi.

> "The local team from Agfa HealthCare was of inestimable value during the process of the project, as they offered different types of specialized knowledge to help identify the specific needs."
>
> GERMÁN GILES, Medical Technology Director

The project tender required that the IT solutions proposed for CEMA be based on the Project Management Institute (PMI) and its high project standards, to specify baselines for the implementation schedules, the staff needed and the hardware necessary to start this project. According to Dr. Cristaldi, Agfa HealthCare's solutions not only complied with the standards required by the municipality; they also offered a very attractive economic proposal, which facilitated the decision when assigning the tender.

The implementation was very structured, and broken into steps, including progressive training steps. This was helpful because the staff members were starting from a variety of perspectives, e.g. the staff at CEMA were more easily trained because they were all new; meanwhile at the health centers the staff were used to working with conventional radiology solutions and protocols.

BENCHMARK FOR CARE IN LATIN AMERICA

As the first site of its kind in the country to be developed as completely digital, CEMA is a model of efficiency and cost-effectiveness. This pilot project is being analyzed so it can be duplicated not only in the province of Buenos Aires, but in other municipalities in Argentina as well. "It is perceived as a benchmark for healthcare in Latin America," concludes Dr. Cristaldi. •

AGFA HEALTHCARE'S CONTRIBUTION

- Recognized across Latin America for healthcare technology and expertise
- Strong local team provides support and knowledge at all stages in the process
- Focus on integration for more efficient provision of healthcare

SOLUTIONS

CR 30-X
- Compact, tabletop digitizer for Computed Radiography where space is limited or in mobile environments

CR 35-X
- Supports a broad range of applications and provides significant results to facilities experiencing a high volume of spinal examinations among other common orthopaedic exams

CR 85-X
- Multi-user, multi-application digitizer with compact footprint, for centralized Computed Radiography environments

IMPAX PACS
- Next-generation PACS, streamlines enterprise workflow and delivers increased efficiency and productivity

IMPAX RIS
- Electronically manages radiology operations, from patient registration through worklist generation and transcription, to medical reporting and business intelligence

iPlan
- Internet-based enterprise scheduling and planning solution

DID YOU KNOW...

- Mar del Plata is the seventh largest city in Argentina.
- In the early 20th century inhabitants of Buenos Aires began to come to Mar del Plata as a holiday resort, and it is the biggest seaside beach resort in the country today.
- It is the most popular destination for conventions in Argentina, after Buenos Aires.

COMMUNICATING WITHOUT WORDS

It's the electricity between partners that gives the tango its magic. You can't quite see it, but when it's there the dance becomes transcendent. The tango first saw its start in African-Argentine dance venues, frequented by 'compadritos' – young men with a certain style.

AMC HOSPITAL, AMSTERDAM, THE NETHERLANDS

Global Remote Incident Prevention services bring peace of mind to radiology department

GRIP increases uptime levels and reduces patient care delays

INTERVIEWEES Dr. Annette Bak, Manager of Radiology and Nuclear Medicine · Jan Wolters, Functional Application Specialist

With its new GRIP remote monitoring and event management and reporting solution, the Academic Medical Center (AMC) in Amsterdam, The Netherlands, expects to reduce the incidence of technical incidents. "With GRIP we can provide higher uptime levels to our users in the radiology department," says Functional Application Specialist Jan Wolters.

> "It brings a peace of mind that incidents will not affect our end users."
>
> DR. ANNETTE BAK,
> Manager of Radiology and Nuclear Medicine

Before AMC Hospital in Amsterdam decided to install an IMPAX RIS/PACS solution from Agfa HealthCare, it went through a lengthy European tender process. "The upside of this was that we gained an in-depth view of our IT-supported workflow," says Dr. Annette Bak, Manager of Radiology and Nuclear Medicine. "Agfa HealthCare showed the best overall score, and when they suggested that we support our version of the IMPAX radiology solution with Global Remote Incident Prevention (GRIP), we were quite confident we would also benefit from this new service."

GRIP provides state-of-the-art electronic monitoring of IMPAX RIS/PACS to help prevent service interruptions or downtime surprises in the healthcare IT environment. A permanently open VPN connection links GRIP to the Agfa HealthCare central monitoring center in Rijswijk, The Netherlands.

PREVENTING DELAYS IN PATIENT CARE

GRIP services consist of a real-time, centralized global monitoring center and technical team, watching for disruptive incidents at all connected customer sites. "You can have communication problems between RIS and PACS, where patients may not be included in the PACS queue, but they may already be in the examination room," says Jan Wolters. "Currently we have some 80 open incidents. We look into each incident first ourselves, and if we cannot handle it, we refer to Agfa HealthCare's helpdesk."

At AMC Hospital, the GRIP solution is set up to act when certain thresholds of event incidence are surpassed. The threshold determines when GRIP notifies the hospital, explains Jan Wolters. "At the moment we are fine-tuning these thresholds together with Agfa HealthCare and also implementing new monitoring points in the system. A low threshold results in a high reporting level of incidents, many of which may not be important. A high threshold may lead to a reduced preventive reliability. The balance is where we have the lowest

possible level of incident reporting by the users in radiology and nuclear medicine, which means that GRIP takes care of the incidents before they actually occur. Ideally, Agfa HealthCare would be monitoring and handling the problems faster than our users can experience them."

KNOWLEDGE OF A PROBLEM BEFORE IT OCCURS

GRIP allows AMC Hospital to know about a problem before it occurs, and this knowledge can enable staff to prevent the incident from taking place at all. Says Dr. Annette Bak: "We clearly expect to benefit from GRIP from a user perspective. Upfront awareness of potential disruptions, 24/7, allows IT to intervene before outages or incidents occur and even help make sure they do not occur in the future. It brings a peace of mind that incidents will not affect us."

Jan Wolters provides an example. "We recently were pre-notified of a memory space problem that would occur in one of our servers. Because of this report, we were able to anticipate and avoid problems. This allows us to increase our uptime levels to our end users in the hospital."

CLINICIANS WORK EFFICIENTLY AND RELIABLY, THANKS TO ENHANCED UPTIME

AMC Hospital has an SLA agreement outlining uptime expectations, and Agfa HealthCare is keen on keeping uptime as high as possible and preventing any unsettling downtime surprises. This is the win-win between both parties, says Jan Wolters. "Our clinicians need to be able to do their job reliably. This requires uptime of the services offered by Agfa HealthCare. With our particular Agfa HealthCare system configuration, our SLA is end-to-end 99.84% guaranteed. The uptime is measured each quarter and needs to be end-to-end all the way to the end user. We use a stopwatch model when incidents occur, allowing us to label an incident from P1, a major problem, to P4, a low relevance incident. GRIP can prevent incidents evolving from P4 to P1."

"The Agfa HealthCare GRIP solution is a watchdog for AMC Hospital, delivering this service in a reliable way," concludes Jan Wolters. "Constant monitoring by the Agfa HealthCare technical team allows them to quickly detect potential issues and take action, ranging from calling a local technician to intervening remotely to correct the situation. We are still fine-tuning, but the potential is huge."•

> "The Agfa HealthCare GRIP solution is a watchdog for AMC Hospital."
>
> JAN WOLTERS, Functional Application Specialist

> "With GRIP we can provide higher uptime levels to our end users."
>
> JAN WOLTERS, Functional Application Specialist

SOLUTION

Global Remote Incident Prevention (GRIP) services with:

- Remote monitoring of the complete Agfa HealthCare system infrastructure
- Event management for fast action remotely when issues arise
- Event reporting of all warnings with instant graphical displays and historical records of past events
- 24/7 SLA

AGFA HEALTHCARE'S CONTRIBUTION

- Support IMPAX radiology solution with Global Remote Incident Prevention (GRIP) services
- Define an SLA agreement focused on keeping high uptime and preventing downtime
- Team up with AMC's IT department and end users to find the right level of incident reporting

DID YOU KNOW...

- The Academic Medical Center was founded in 1983, when two hospitals from the Amsterdam city center, the Wilhelmina Gasthuis and the Binnengasthuis, merged with the medical faculty of the University of Amsterdam.
- In collaboration with the city of Amsterdam, AMC Hospital is stimulating the development of a Medical Business Park: a whole range of innovative businesses and research institutes in the field of healthcare, biosciences and life sciences.
- AMC Hospital has 1,010 beds, and about 7,000 employees.

UC IRVINE HEALTH, ORANGE COUNTY, CALIFORNIA, USA

Unique technology in ICIS 'connects the dots' between EHR and patient images

Built-in acquisition and workflow reference tools create the links between data and users

INTERVIEWEE Jim Murry, Chief Information Officer, UC Irvine Health and Associate Dean of IT & Informatics, School of Medicine

"By giving people access to images from anywhere, connected to reports, we're improving patient care."

JIM MURRY, Chief Information Officer

Like many healthcare enterprises, UC Irvine Health needed a way to manage the explosion in patient images and data. From ultrasounds to OR videos, from X-rays to angiograms, the facility had to find a solution to manage these millions of patient images, securely and cost-effectively, and also link them seamlessly to the Electronic Health Record (EHR). With ICIS, an enterprise clinical IT platform from Agfa HealthCare, UC Irvine found a comprehensive solution that provides data storage and much more.

UC Irvine Medical Center is Orange County's only university medical center, not far from Los Angeles. Opened in 1976, the 422-bed medical facility offers a full scope of acute and general care services, including a regional burn center, Level I trauma center, neuropsychiatric center, Level III neonatal care unit and a National Cancer Institute (NCI) designated comprehensive cancer center. It has about 35,000 ER visits per year, and 18,000 admissions.

There were several key criteria that the UC Irvine image storage solution had to address. "It had to be able to hold any type of digital image, it had to be scalable, able to scale up and out, it needed to have a single viewer, and it needed to be very fast – users just won't tolerate a slow system," says Jim Murry, Chief Information Officer. "It needed to be compatible with our disaster recovery approach, and it needed to have the workflow technology built right into it."

WORKFLOW TECHNOLOGY IN ICIS SETS IT ABOVE STANDARD VNAS

For Jim Murry and his team, the workflow technology in the Imaging Clinical Information System (ICIS) is what elevates this solution above standard vendor neutral archives. "A vendor neutral archive on its own does not typically have this connecting piece – a workflow tool that allows you to 'connect the dots', to connect an image to a report," describes Jim Murry. "In the Agfa HealthCare solution there are workflows and technologies that let you get into the archive, and build a reference that allows you to feed it back into the EHR through interfaces, and connect up with the report. This allows a physician to read a report, then click on an icon to see an image, and the system will retrieve that precise image from this massive collection of images and present them with exactly the one they want to see."

In its search for a partner for its image repository, UC Irvine reviewed the marketplace, compared other vendors, and also turned to its radiology department. Since the radiologists were accustomed to working with the image management capabilities of IMPAX, they were able to share their knowledge and experience. "That helped quite a bit," says Jim Murry.

REDUCED COSTS TO MANAGE AND STORE DATA

There are numerous advantages to moving to an enterprise approach. First, there

AGFA HEALTHCARE'S CONTRIBUTION

» Global leaders in managing healthcare images and reports
» Professional, expert teams contribute to projects of all sizes and scope
» Understanding of hospital IT requirements and processes

DID YOU KNOW...

» The ICIS repository at UC Irvine will contain about 17 terabytes of data by the end of 2013; the IT department anticipates about 1 terabyte will be added each month.
» More than 60 UC Irvine Health physicians are listed as Physicians of Excellence in the January 2013 issue of Orange Coast magazine, selected by the Orange County Medical Association.
» The UC Irvine School of Medicine offers summer enrichment programs to about 150 high school students interested in pursuing careers in healthcare and research.

are all the costs associated with running separate image storage 'silos' across the hospital enterprise. "Now, instead of buying and managing storage for all these one-off departments, I'm supporting one enterprise-scale storage system," explains Jim Murry, "greatly reducing the investment needed in these one-off storage solutions."

The approach also brings more focus around the role of the CIO, and strengthens the connection between technology and the hospital's strategic goals. For UC Irvine, this improved access to information will help towards the enterprise's goal to become one of the top 20 academic health systems in the United States, within five years. This ranking looks at clinical, research and education outcomes – all areas that will see benefits with the implementation of ICIS.

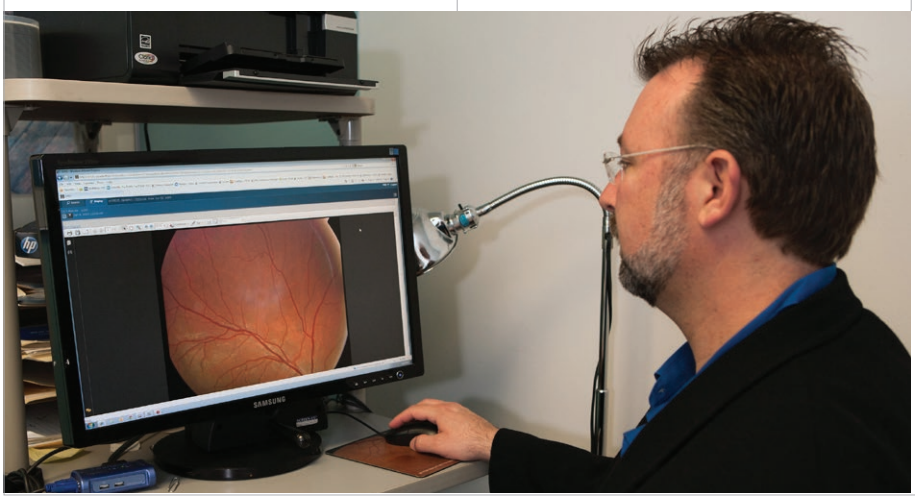
ENABLING BETTER CLINICAL OUTCOMES AND RESEARCH WORK

"By giving people access to images from anywhere, connected to reports, we're improving patient care," says Jim. "When you look at what we will be able to do with the data and the metadata, we're enabling better clinical outcomes and research work. For the first time ever, through this technology, and the right protocols, researchers will be able to access the metadata to understand and identify cohorts, and access images that they couldn't access before."

Another focus as a medical school is data security. Students, and professors, need access to images, but access must be strictly controlled. With all images in a single archive, it is easier to control and monitor access. "You can get access to the images from anywhere in the world, if you have the right security, but you can't download anything, without IT oversight and encryption," Jim comments.

So far, the ophthalmology department has gone live; cardiology is next, to be followed by ultrasound. At the same time, Jim is working with Agfa HealthCare's Managed and Cloud Services to move the solution to the cloud. "Right now, the storage is sitting in my data center. When we move it to the cloud, it becomes even more scalable, we can look at genomics, research, we can move the entire PACS into this environment. Agfa HealthCare will look after backups, disaster recovery, all of that," he says. "Agfa HealthCare brought good, experienced resources to the table, they've got a great team, they made this happen." •

> "Agfa HealthCare brought good, experienced resources to the table, they've got a great team, they made this happen."
>
> JIM MURRY, Chief Information Officer



SOLUTIONS

Imaging Clinical Information System (ICIS)
» Provides a comprehensive view of multimedia patient imaging records, across regions, facilities and departments, creating a true longitudinal patient imaging record by integrating and linking multi-facility, multi-departmental and multi-specialty imaging data

XERO Technology Viewer
» Enables anywhere, anytime access to images
» Provides secure access to standard healthcare data from existing workstations anywhere on the network
» Uses any popular internet browser and simple network connection
» No software download or installation required

IMPAX PACS
» Integrated reporting solution provides easy and convenient access to reports, workflow optimized for the different users in an enterprise, web-deployable for access to data from any location

Envision your EHR with imaging using ICIS

Despite the promise of the Electronic Health Record (EHR) to provide a view of patient health generated from encounters across all healthcare settings, imaging has been a critical missing component. Until now. In keeping with its "Leave no image behind" promise, Agfa HealthCare has developed the Imaging Clinical Information System, or ICIS, to provide clinical images within the EHR. In this article, Charles Morris, Chris Magyar and Genady Knizhnik of Agfa HealthCare reveal how ICIS empowers physicians to make more informed care decisions by embedding medical image accessibility within the EHR user interface to provide a more accurate view of the patient.

Healthcare organizations around the globe are under pressure to deliver care more cost-effectively and with higher quality. One way to achieve this is to empower physicians with easy, direct access to all of a patient's relevant medical information. While this understanding is driving a meteoric rise in Electronic Health Record installations, there is still one significant roadblock to ultimate clinical productivity: most of the EHRs available on the market today do not complement the textual data with relevant clinical images.

"Physicians can deliver better, more expedient care when they have immediate access to a patient's entire medical history regardless of the care setting the information was created within," explains Charles Morris, ICIS US Market Segment Manager. "If they are limited to only looking at the textual data that comes out of the EHR, then they aren't getting the whole picture. The addition of pre-diagnostic, diagnostic, treatment, and descriptive imaging data gives a truly integrated view of the continuity of care."

IMAGING SILOS ARE WIDESPREAD

Giving physicians access to all the images associated with a particular patient isn't easy. "Most departments have their own solutions for capturing images, but their strategies for storing and distributing those images vary greatly," says Genady Knizhnik, Business Development Director, Regional Health EMEA. "Radiology has the systems in place to manage all of their images, data and workflow – and even to collaborate through regional PACS – but other departments do not have the same level of sophistication. Solutions can range from sophisticated and automated image capture and workflow to simple digital snapshots, for example, in dermatology."

While each department's clinical image storage solution is based on procedures that work fine within their own walls, things get more complicated when they try to share those images with colleagues in other facilities or departments, or with referring physicians.

"Images are going into private departmental silos in every possible way that you can imagine," explains Chris Magyar, Head of the ICIS Business Unit for the US Region. "Some images are printed out and filed in a paper record. Some are stored on hard drives, CD or USB sticks. Some are entered as a line item in a spreadsheet. Now imagine you're a physician from another department and you're making a care decision. How much time do you have to hunt that image down? Even if you do have the time, there is no guarantee that you will find what you are looking for in the end. You have to choose between doing without that piece of the puzzle or, if you can't, reordering an imaging study that has already been performed."

Given these realities, image-enabling the EHR is a logical way to help physicians deliver higher quality care, faster. To put it in context, imagine an orthopaedic or plastic surgeon is preparing to repair a patient's severely injured hand. If the surgeon was able to access images within the EHR to visualize the hand, using clinical photography side by side with CT and perhaps even MRI imaging, it would add so much value to the process and the patient. Furthermore, if the primary care physician also had easy access to pre- and post-surgery images and reports through the EHR, that patient's experience would become richer still.

TAKING THE EHR TO A WHOLE NEW LEVEL

"Our Imaging Clinical Information System addresses a whole class of missing information from the EHR," explains Morris. "It seamlessly captures imaging data in a clinical context and then links it to the EHR. Since the images are embedded inside the primary textual interface, it is much more streamlined and efficient for the people using it. Images are presented in the context of the patient's entire health record. Doctors do not know that ICIS is managing the imaging health record, they simply know that images show up within the EHR when they need them."

According to Morris, creating ICIS involved looking at existing Agfa HealthCare solutions and expertise and imagining what was possible.

> "ICIS has workflow components for capturing image sources that do not adhere to DICOM standards, creating metadata around them and delivering them to the same Vendor Neutral Archive as the more traditional imaging generated by departments like radiology."
>
> GENADY KNIZHNIK, Business Development Director, Regional Health EMEA

> "The addition of pre-diagnostic, diagnostic, treatment, and descriptive imaging data gives a truly integrated view of the continuity of care."
>
> CHARLES MORRIS,
> ICIS US Market Segment Manager

"We wanted to create a platform solution composed of Agfa HealthCare technologies that were pre-integrated together in a particular way so that when we encounter a department that has gaps along the chain of acquiring, viewing, interpreting, storing and sharing images, we can offer them a complete workflow. And that workflow leverages technology that is in place or provides supplemental technology to produce a high-quality, intelligent imaging study that is ready for EHR integration."

"ICIS has workflow components for capturing image sources that do not adhere to DICOM standards, creating metadata around them and delivering them to the same Vendor Neutral Archive as the more traditional imaging generated by departments like radiology," explains Knizhnik. "So if we go back to our surgery example, where the emergency department is recording images with their digital camera, ICIS can store those images alongside traditional DICOM images and make both accessible to everyone through the EHR."

ICIS also includes Agfa HealthCare's widely adopted regional health portfolio that enables the creation of image sharing networks across administrative or geographical boundaries. This provides radiologists and clinicians with access to the patient's entire radiology history irrespective of the originating radiology department. Moreover, it enables health authorities to optimize the utilization of both radiologist and radiology equipment by allowing an "acquire anywhere – report from anywhere" workflow.

ICIS has the clinical breadth to cross the 3 primary care settings: inpatient, ambulatory/outpatient and physician's offices. Since each environment delivers care differently (encounter-based medicine vs. schedule-based medicine vs. office appointments), ICIS supports their unique workflow in order to successfully acquire images.

ICIS IS FOR EVERYONE

"In a way, ICIS is really the second frontier of the EHR," says Morris. "The primary health record is the single most important thing we can do for patients. And then right behind it is the imaging record. All hospitals need this technology."

ICIS offers a vendor neutral architecture and support for multiple patient ID domains. What this enables is the ability to provide a comprehensive patient health record across departments within a single facility or between multiple facilities. Hospital groups, Integrated Delivery Networks (IDN), or public and private health information exchanges can develop and effectively share unified patient records containing both images and textual information.

"ICIS enables healthcare organizations to share imaging information across regional, facility, departmental and technical boundaries," says Magyar. "This allows them to focus on their primary mission of care delivery."

In this era of increasing regulatory pressures and efficiency focus, getting images out of departmental silos and in front of the physicians who need them just makes sense. Adding an imaging layer to the EHR with ICIS can deliver far-reaching benefits that go above and beyond expedited delivery of care and improved clinical confidence. Surgeons can use it to enhance their preparation process. Primary care physicians can leverage it to deliver more detailed, image-rich patient consultations. Physicians can access it to streamline their collaborations, even in emergency medical situations. Plus having the images in the EHR where authorized stakeholders can access them helps eliminate the cost- and labor-intensive process of ordering duplicate imaging procedures.

"You don't need to wait until your EHR is up and running to think about image enablement," advises Knizhnik. "If you're in the process of implementing your EHR, or even if you're just in the planning stages, it is a good time to have a conversation about ICIS. Getting Agfa HealthCare involved earlier in the process is beneficial because we can help make important decisions regarding the acquisition, discovery and access of imaging and non-imaging data."

INDUSTRY-FIRST IMAGE ENABLEMENT

ICIS is a unique solution in the industry today. "The healthcare market is now fully appreciating the value of managing images in the EHR," says Knizhnik. "Agfa HealthCare is in a great position to leverage the experience we have gained over the past 15 years improving image and information management for the radiology world. We have the experience, expertise and products to make it happen."

"We don't just think about image management from the perspective of the radiologist," says Magyar. "We have been stretching beyond that perspective for some time and considering how imaging affects the overall quality, cost and effectiveness of care. Any number of vendors will sell you a place to store your images. That's not good enough. The true value comes in having a solution that gives physicians access to stored images from all sources in the context of the EHR. That's what makes ICIS different and so powerful."

"Someone might ask why physicians need images in the EHR now when their current methods have served them for so long. Diagnoses still happen, people receive the care that they need," says Morris. "It is one of those you-don't-know-what-you've-been-missing-until-you-have-it scenarios. Once physicians have access to the image-enabled EHR, just try taking it away. They won't let you." Agfa HealthCare has already enabled sharing of imaging data for customers in Europe, Brazil, Canada, and the United States. ICIS is globally available to healthcare organizations everywhere.

> "ICIS enables healthcare organizations to share imaging information across regional, facility, departmental and technical boundaries. This allows them to focus on their primary mission of care delivery."
>
> CHRIS MAGYAR,
> Head of the ICIS Business Unit for the US Region

© Sandro

AN ARTIST'S PERSPECTIVE

Internationally-renowned photographer Sandro's love of dance shines through in his images of dancers from the River North Chicago Dance Company and the Joffrey Ballet. With over twenty years' experience photographing dancers, Sandro's photographs capture perfectly the beautiful movements of the tango.

NORWEGIAN RADIUM HOSPITAL, OSLO, NORWAY

Helping multi-disciplinary teams work together more efficiently

'Easier image interpretation' and streamlined management of high image volumes deliver more informed treatment plans at leading cancer center

INTERVIEWEE Dr. Cathrine Saxhaug, Specialist in Oncologic Radiology

"We use Volume Viewing 'live' when we demonstrate pathology for the clinicians, because we can choose to display IMPAX Volume Viewing on the projector screens."

DR. CATHRINE SAXHAUG, Specialist in Oncologic Radiology

As the largest cancer center in Northern Europe, combining a hospital and a research arm (the Institute for Cancer Research), the Norwegian Radium Hospital is leading the way with new cancer treatments and ground-breaking scientific advancements. With the implementation of IMPAX Volume Viewing, one of the latest clinical applications available for IMPAX, the hospital has applied that same approach to the technology and processes that support the work of its professional teams.

As a cancer center, the hospital's imaging requirements are complex. Many diverse groups within the hospital work with patient images; and there is also a high volume of images to manage – both those that come from outside, from referring physicians across Norway, and those from exams performed within the hospital itself. "We have more exams coming in from referring doctors than those we do ourselves," says Dr. Cathrine Saxhaug, Specialist in Oncologic Radiology, whose primary focus is on brain tumors and head and neck cancer.

Diagnostic imaging is used to diagnose cancer, and also to assess responses to treatment. In addition, many research protocols are more image-intensive than clinical imaging, and they can also require more types of imaging.

Another difference as a cancer center is the close cooperation between the radiologists and the oncologists, physicists and technicians who perform radiation therapy. "We really work together as a team," says Dr. Saxhaug.

FASTER, EASIER IMAGE INTERPRETATION AND DETECTION OF PATHOLOGIES

The heaviest imaging demands come from the large volumes generated by MR. "We do a lot of 3D volume imaging, so we need to have a system that displays the volumes effectively," explains Dr. Saxhaug. The hospital uses IMPAX Volume Viewing mainly for MR, but also CT and PET CT. "In MR we

use it all the time," says Dr. Saxhaug. "It gives us a better visualization of the image volumes, and it is easier to interpret the images and to find pathologies. Another major use for IMPAX Volume Viewing is to compare two sets of images effectively by using the registration tool: either a comparison of two different sequences from the same exam or a comparison of the same sequence from two different exams. This is an efficient way of monitoring tumor development and treatment response over time."

IMPAX Volume Viewing offers advanced visualization tools including MIP/MPR, volume rendering and segmentation, and allows users to save reconstructed series, static screenshots and video captures. With IMPAX Volume Viewing PLUS (an optional extension for IMPAX Volume Viewing), users at the Norwegian Radium Hospital can also view series in fusion mode or subtraction mode, and it offers automatic registration of both volumes. "The advanced functionality of automatic registration and fusion is extremely helpful and useful for us," says Dr. Saxhaug.

A tight integration with IMPAX PACS makes IMPAX Volume Viewing highly efficient. "It improves the workflow, and you don't waste time loading all the images," comments Dr. Saxhaug. "It is seamless, easy to use, fast, offers a high level of automation and it has a familiar user interface."

RADIOLOGY-LED MEETINGS BENEFIT WITH BETTER VIEW OF PATIENT INFORMATION

The radiologists at the hospital hold daily and weekly meetings in the radiology department, where they demonstrate pathology for the hospital's clinicians. "In Norway, these meetings are a central way for the radiologists to provide information to clinicians," says Dr. Saxhaug.

The daily meetings focus on cancer patients who will be operated on, or receive radiation treatment, that day. Clinicians attend in groups, according to their specialty area. For example the oncologists who are working with brain tumors come as a group, or the surgeons who are working with breast cancer. "We use Volume Viewing 'live' when we demonstrate pathology for the clinicians, because we can choose to display IMPAX Volume Viewing on the projector screens. It gives them a better picture of the pathology. For the surgeons, for example, it makes it easier to visualize the tumors in reference to neighboring structures."

The radiologists also host weekly multi-disciplinary team meetings, which are attended by surgeons, oncologists, pathologists and nurses. These meetings include discussions on cancer treatment options and next steps, and here also the participants refer extensively to patient images.

"The advanced functionality of automatic registration and fusion is extremely helpful and useful for us."

DR. CATHRINE SAXHAUG,
Specialist in Oncologic Radiology

> "It gives us a better visualization of the image volumes, and it is easier to interpret the images and to find pathologies."
>
> DR. CATHRINE SAXHAUG,
> Specialist in Oncologic Radiology

In addition to providing a better view of the images, the implementation of IMPAX Volume Viewing has also helped to streamline the daily and weekly meeting process. "Because the Volume Viewing is so tightly integrated with IMPAX, we can start volume viewing right when we are in a specific study," describes Dr. Saxhaug. "We use the IMPAX PACS as the 'mother' system, and we have two image screens plus a third screen where we have Volume Viewing. We are looking to add a fourth screen, which will add an area for text as well."

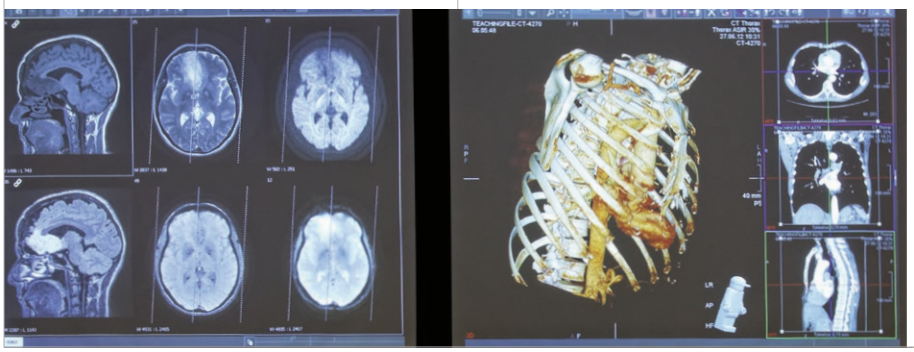
NEW APPLICATIONS TO HELP MANAGE IMAGES AND AID IN DIAGNOSES COMING IN FUTURE

A challenge for the Norwegian Radium Hospital, and for hospitals around the world, is how best to manage the exponential increase and complexity in images and data. Agfa HealthCare has introduced IMPAX Volume Viewing and a range of other clinical applications in answer to this need, and is working on others that will further address the management of large image and data volumes.

For Dr. Saxhaug, advances in technology in this area will become increasingly important. "We use a combination of different imaging types and different modalities in the majority of patients, which means a lot of information for radiologists to sort. We need more help from computers, in sorting different types of signal intensities from all the different types of sequences. This is what I think technology will do in the future. If you 'teach' it, a computer can sort this huge amount of information rapidly and present it to us, much more easily than if we look through every single image of an exam that has 7,000 images. We are moving more and more in this direction," she concludes. •

DID YOU KNOW...

- The Institute for Cancer Research has internationally strong research groups within biochemistry, cell and tumor biology, genetics, radiation biology, immunology and cancer prevention.
- The Norwegian Radium Hospital is part of the Oslo University Hospital, one of the largest hospitals in Scandinavia, with more than 40 different locations, and more than 20,000 employees.
- Oslo University Hospital treats more than 1.2 million patients each year.



SOLUTIONS

IMPAX Volume Viewing

- Provides radiologists with advanced visualization tools to diagnose large CT and MR volumes
- Covers MIP/MPR, volume rendering and segmentation
- Allows users to save reconstructed series, static screenshots and video captures

IMPAX Volume Viewing PLUS

- Optional extension, allows users to view two series from the same or from different studies simultaneously and view series in fusion or subtraction mode, and offers automatic registration of both volumes as well as stereoscopic 3D view

IMPAX PACS

- World leader in enterprise-wide image and information management
- Offers seamless integration with IMPAX Clinical Applications

AGFA HEALTHCARE'S CONTRIBUTION

- Builds solutions that integrate seamlessly, across modalities and enterprise IT
- In-depth knowledge of image and information management, founded on decades of experience with PACS
- Can scale solutions and expertise according to modality and connectivity requirements

CANISIUS-WILHELMINA ZIEKENHUIS, NIJMEGEN, THE NETHERLANDS

CWZ Nijmegen goes beyond PACS vendor lock-in with new Vendor Neutral Archive

'Leave no image behind' approach extends PACS-independent view of EHR across all clinical departments

INTERVIEWEE Pascal van Nispen, Information Advisor

Moving beyond the limits of PACS vendor lock-in and taking the lead in the development of a regional Electronic Health Record (EHR) were the drivers for the Dutch Canisius-Wilhelmina Hospital in its implementation of Agfa HealthCare's Vendor Neutral Archive IMPAX Data Center (IDC). As an enterprise or regional imaging management solution, IDC extends the EHR to include all medical images and related information to the point-of-care inside and outside of the hospital.

With University Medical Center St Radboud nearby, Canisius-Wilhelmina Hospital (CWZ) is both competing and collaborating with one of The Netherlands' foremost healthcare centers. Sharing patient data is part of this relationship and CWZ decided to take the lead in developing a regional EHR. When Agfa HealthCare's Vendor Neutral Archive IDC becomes available to the CWZ healthcare network, a major milestone will have been reached.

"With Agfa HealthCare's Vendor Neutral Archive solution we rise above the PACS vendor lock-in constraints and can start sharing data with other hospitals to coordinate care."

PASCAL VAN NISPEN, Information Advisor

A VNA CONCEPT TO STOP BUILD-UP OF IMAGING SILOS

With a strong board of directors at its helm, CWZ has taken its future firmly in hand. The hospital has been recognized by the Dutch government as a top-clinical hospital in the fields of neurosurgery, PCI (Percutaneous Coronary Intervention) and ICD (Implantable Cardioverter Defibrillator) surgery, and it also has a strong reputation as a pioneer in several medical fields, such as childhood diabetes, large vein surgery and laparoscopy interventions. The fourth medical training institute of the country, CWZ has a continuous influx of young and ambitious clinicians and care professionals that share this dedication.

Almost 380,000 day clinic visits and over 31,000 inpatients per year across its six sites mean that the hospital must organize its workflows effectively. Pascal van Nispen, Information Advisor, conducted an inventory of the existing image flows. "We found that our imaging flows were diverse, to say the least. Some departments printed their own images and attached them in paper to a departmental paper patient file, some saved images as compressed jpegs, some stored them on offline CDs. All of these 'imaging silos' resulted in a lack of centralized management, corrupt

SOLUTIONS

» IMPAX Data Center VNA with XERO Technology Viewer
» Long-term Managed Services Agreement
» Serve as General Contractor within multi-vendor agreement

AGFA HEALTHCARE'S CONTRIBUTION

» Meeting the aim of the customer to move beyond vendor-based PACS and take the lead in regional EHR concept
» Comprehensive Managed Services concept that provides peace of mind to IT and clinical users
» Ability to take the lead in a multi-vendor environment

files, and incomplete patient records. Our findings led our board to propose a centralized approach based on a Vendor Neutral Archive (VNA)."

Pascal van Nispen: "We decided to ask Agfa HealthCare to take the lead as our general contractor, coordinating with our local PACS vendor, and provide a VNA solution to six departments in the first phase: gastroenterology, ophthalmology, urology, pneumology, the OR and the medical photographer," says Pascal van Nispen. "Agfa HealthCare had already provided its IMPAX PACS solution to radiology, cardiology and nuclear medicine, and our local hospital-wide PACS vendor joined in, so each department had digital access in one way or another to patient images and data. We just needed to centralize all imaging data, be able to validate it, and share it seamlessly with all of our care professionals."

Agfa HealthCare's role was to provide a back-end solution that would enable all images to be centrally stored, and be HL7, DICOM, IHE and XDS/XDS-I Framework compliant. The IMPAX Data Center is central to creating a longitudinal imaging-enabled medical record and is designed to work with multi-vendor solutions. "We wanted to steer away from a vendor lock-in," says Pascal van Nispen, "and we were looking for the lowest integration cost possible. Agfa HealthCare supports the hardware infrastructure according to the service level specifications in our Managed Services Agreement, and proactively determines when to replace or upgrade the solution to improve uptime and functionality.

A LOW-COST AND USER-FRIENDLY WAY TO VIEW ALL IMAGES IN THE EHR

In line with the hospital's aim to play a leading role in the development of a regional Electronic Health Record, using the Agfa HealthCare XERO Technology Viewer as the unique way to access images coming from the VNA is a major asset. This enterprise medical image viewer allows clinicians to access imaging information securely and independent of location, on a variety of web-enabled devices, improving the delivery of patient care through point-of-care access to patient data.

"The XERO Technology Viewer is an important asset to us, as it doesn't require the installation of client software. It uses existing infrastructure and connects on standard browsers, such as Microsoft Internet Explorer, Google Chrome, or Mozilla Firefox," says van Nispen. "Our clinical users will access medical images from any location and image source across the hospital, straight from the patient record. It is a matter of time before we extend our VNA with the XERO Technology Viewer to outside referring doctors, remote sites and collaborating hospitals, completely secure."

This will fully release the power of the VNA concept to the care network and also to the patients, continues van Nispen. Instead of paper prints, CDs or even "snail mail" transfer of images, examination images and results will be able to be accessed by referring doctors or tertiary care clinicians almost immediately. "This will result in fewer retakes, fewer superfluous examinations and a more streamlined patient flow between care providers. With XERO integrated in the EHR, we can complete our VNA proof-of-concept and start expanding its use outside our campus. We will then be able to really rise above the PACS vendor lock-in constraints and start sharing imaging data with other hospitals to coordinate care." •

DID YOU KNOW...

» Nijmegen is the oldest town in The Netherlands as we know it today. It was 2,000 years old in 2005.
» The most famous story, known in literature throughout Europe and the Middle East, is that of Mariken van Nieumeghen, an inhabitant of Nijmegen. It is a late medieval Dutch text from the early 16th century, where Mariken spends seven years with the devil, after which she is miraculously released having confessed her sins with remorse to Saint Mary. The morale of the story is that no matter how sinful one is, there is always salvation through Saint Mary.

ALLEGIANCE HEALTH, JACKSON, MICHIGAN, USA

On-the-go bedside imaging brings better care to patients in ER and beyond

Moving technology to 'critical areas' as needed lets doctors and technologists obtain images and share results more quickly

INTERVIEWEES Robyn Pulliam, Director of Imaging Services · Dr. Samir Parikh, Vice Chief Radiologist · Amy Helton, Manager of Imaging Performance and Quality

Allegiance Health has played an integral role in south-central Michigan for more than 90 years, growing from a 100-bed facility to a full-service acute care community health system, now with 411 beds and a broad range of specialty departments. In its continuous effort to improve patient care and processes, Allegiance Health recently implemented two DX-D 100 mobile DR solutions from Agfa HealthCare.

Allegiance Health interprets 'community' broadly, extending the definition to include an emphasis on education, both on the medical side and community outreach. It will become a teaching hospital in 2014, bringing 140 new physicians to Jackson. The hospital also strives to educate its community through initiatives like the Speakers Bureau, offering experts to speak to groups on topics such as diabetes, health and wellness, or palliative care.

For imaging, this focus on education translates into a collaboration with local colleges. Allegiance provides a clinical experience for students of general radiology, ultrasound and nuclear medicine. "Having students in the department supports an atmosphere of professional growth for all of us," says Amy Helton, Manager of Imaging Performance and Quality at Allegiance Health. "They're able to learn in a variety of settings, on both older analog and the newest digital solutions."

Imaging services at Allegiance Health include about 170 staff members, operating 20 departments that include MRI, CT, general radiology, nuclear medicine and mammography, producing about 230,000 procedures each year.

IMMEDIATE ACCESS TO INTERPRET IMAGES FROM ANYWHERE

One of the key drivers in the hospital's decision to add mobile DR to this range of services was the need to receive and share images, especially in critical cases, more quickly. "It's important to have direct digital technology in critical areas, so that the image can be viewed and evaluated immediately," says Amy Helton. For Dr. Samir Parikh, Vice Chief Radiologist, the speedy image access that is enabled by the DX-D 100 solution is vitally important.

"The DX-D 100 solutions were the choice for us, meeting the criteria, providing overall value and ensuring the best use of our resources."

ROBYN PULLIAM, Director of Imaging Services

"My staff technologists like the MUSICA² image processing software, because they can make immediate adjustments improving efficiency, and the images are excellent."

AMY HELTON,
Manager of Imaging Performance and Quality

"The DICOM wireless connectivity is of great benefit," he says. "We have immediate access to interpret images from anywhere in the hospital, or even our offices."

One DX-D 100 is used in the emergency department, and the other is used on select patient floors. With its large servo-driven wheels, and narrow width, "it maneuvers easily throughout the building," says Amy Helton. "In addition, my staff technologists like the MUSICA² image processing software, because they can make immediate adjustments improving efficiency, and the images are excellent."

The 'gold-standard' MUSICA² image processing has been specially adapted for the DX-D 100 and tuned to further enhance the excellent DR image quality. Exam-independent, it provides consistent image quality and high-contrast detail.

IMPROVED IMAGE QUALITY AND DECREASED RADIATION DOSE

For Dr. Parikh, the image quality of the DX-D 100 is important as well. "In general, the quality is much better than conventional portable radiography, providing very sharp and detailed images. In addition, we are able to manipulate the contrast on PACS for better visualization of lines and tubes. There is also an external dose-measuring device that helps us control the dose."

The DX-D 100 features an integrated NX workstation, for an optimal workflow. When users select a specific type of exam, the appropriate X-ray settings are automatically transferred to the X-ray generator and displayed on the touch-screen console. NX adds the exposure parameters used to the digital image file, and communicates seamlessly with the hospital's PACS.

DX-D 100 TAKES THE LEAD IN STRINGENT REVIEW PROCESS

For this first foray into mobile DR, Allegiance Health conducted a stringent review, assessing three vendors' solutions against a long list of requirements, including how the solutions provided patient care, safety, quality, as well as cost, operational and technical factors, and efficiencies gained. "In the end, the DX-D 100 solutions were the choice for us, meeting the criteria, providing overall value and ensuring the best use of our resources," says Robyn Pulliam, Director of Imaging Services. "When we choose responsibly and use resources wisely, it allows us to make good quality healthcare accessible to as many members of the community as possible."

The hospital already had a level of familiarity with Agfa HealthCare, with an IMPAX PACS and CR from Agfa HealthCare in place. "Allegiance has enjoyed a strong business partnership with Agfa HealthCare for over 12 years. We've been pleased with their products, level of responsiveness, and customer service," concludes Robyn Pulliam. •

"In general, the quality is much better than conventional portable radiography, providing very sharp and detailed images."

DR. SAMIR PARIKH, Vice Chief Radiologist

AGFA HEALTHCARE'S CONTRIBUTION

- 100-years' experience in developing imaging solutions to meet full range of hospital requirements
- In-depth understanding of user needs, from technologists to radiologists through to hospital administrators
- Specialists in ergonomics and intuitive systems that are easy to learn and simple to use

SOLUTIONS

DX-D 100 mobile DR solution

- Efficient mobile bedside imaging solution provides improved patient comfort
- Handles broad range of general radiography X-ray studies
- Offers instant high-quality image capture; immediate image validation, transfer and access (HIS/RIS/PACS integration)
- Features specially-tuned MUSICA², for gold-standard image processing, and NX workstation, for smoother workflow

IMPAX PACS

- Foremost image management solution for healthcare providers around the world

DID YOU KNOW...

- The emergency department at Allegiance Health, which sees about 80,000 patients each year, was renovated in 2006, and features 40 private rooms, an on-site pharmacy, valet parking, and family waiting areas.
- Allegiance Health appears in many national rankings, including the CareChex Top 100 Hospital 2012 Medical Excellence Awards; the Distinguished Hospital Award - Clinical Excellence in 2012 for the third year in a row from HealthGrades; and an "A" Patient Safety Rating from The Leapfrog Group.

POWER IN PRECISION

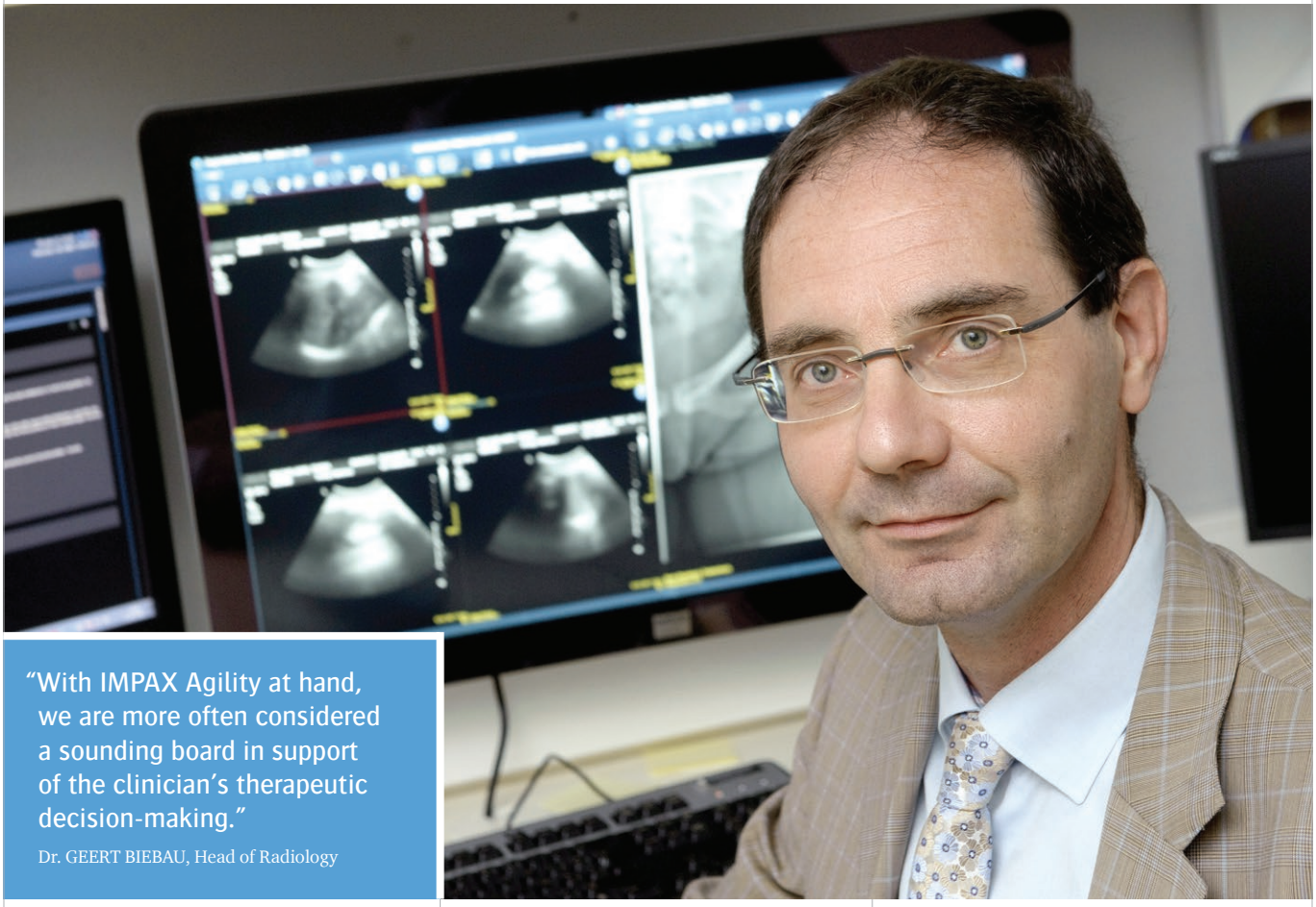
It's deceptively simple. It starts with a walk, and builds to an orchestration, legs and feet drawing silent shapes that tell a story unlike any other. It's romance, crossed with athleticism and art, that draws us in to the magic of the tango.

AZ SINT-REMBERT, BELGIUM

"IMPAX Agility is my office and I take it anywhere I want to work"

Integrated solution takes radiologists closer to clinician's therapeutic decision-making

INTERVIEWEES Dr. Geert Biebau, Medical Director and Head of Radiology · Dr. Frederique Van Robaeys, Radiologist



"With IMPAX Agility at hand, we are more often considered a sounding board in support of the clinician's therapeutic decision-making."

Dr. GEERT BIEBAU, Head of Radiology

Radiologists at Belgium's Sint-Rembert general hospital were the first to test and approve the image display, workflow management and personalized settings of Agfa HealthCare's new IMPAX Agility solution. It passed with honors, connecting the hospital's radiology department with medical imaging of the future.

The radiology team at Sint-Rembert, situated between two major regional hospitals at Roeselare and Bruges, is young and enthusiastic. Under the direction of Dr. Geert Biebau, Head of Radiology and Medical Director of the hospital, three radiologists have been striving to provide top-notch care to their patients. A strong focus on technological advancements is key to their ability to meet the referring clinician's expectations.

Dr. Biebau knows this technology focus also requires accepting an increasingly digital dimension to all their activities. "We have embraced the idea that up-to-date digital technology is essential to providing the best patient care and most accurate information to referring doctors and clinicians." Dr. Biebau's team performs examinations at the hospital site, but for MRI, they use facilities at nearby hospitals in Bruges and at the seaside.

Most modalities, such as MRI, cardio-CT and mammography, require more intense involvement by the radiologist and also stretch the performance and ergonomic demands of the underlying PACS infrastructure. "This requires pushing the boundaries of processing speed, user-friendliness and flexibility," says Dr. Biebau. "So when Agfa HealthCare proposed our testing their new integrated IMPAX solution, called Agility, we did not hesitate."

IMPAX Agility is a new solution in development at Agfa HealthCare. It has been released in Turkey and Brazil and is

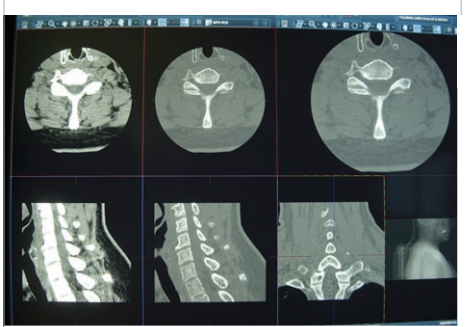
"This is my office and I can easily take it anywhere to continue working with Sint-Rembert's server over a VPN connection."

Dr. FREDERIQUE VAN ROBAEYS, Radiologist

a work in progress currently in the testing and evaluation phase in other regions of the world. Sint-Rembert agreed to serve as one of Agfa HealthCare's test locations for this new solution.

IMPAX AGILITY APPEALS TO MEDICAL PROFESSIONALS THANKS TO INTEGRATION WITH PATIENT INFORMATION

Having used Agfa HealthCare's IMPAX solutions since 2009, the radiology team was able to keep both solutions operational during the trial. Because they were familiar with IMPAX, the team did not need additional training prior to using IMPAX Agility's interface. "It was a way to test, and if necessary, adjust the interface to make it the most intuitive interface possible." Radiologist Dr. Frederique Van Robaeys explains the intuitive interface and the power of IMPAX Agility's integration with other relevant patient information, retrieved from the RIS, HIS, medical patient record, nomenclature and lab result server, as well as the IMPAX archive. "I get all this information from IMPAX Agility's interface, which means I no longer need to login anywhere else or wait for other applications to open."



Images and panels from different modalities are linked together and displayed according to preset hanging protocols, providing a familiar way of looking at results to begin dictation.

HANGING PROTOCOLS ALLOW 3D VIEW OF THE BODY

The interface's starting point is the powerful concept of hanging protocols. This determines how you see images from different modalities at the same time. "The combination of connected axial, coronal and sagittal planes constitutes a 3D view of the body from any perspective I want. Because all images are displayed according to preset hanging protocols, it provides a familiar way of looking at results to begin dictation."

REPORTING MACROS AVOID OMISSIONS, EVEN IF INTERRUPTED DURING REPORTING

"I can see the scanned original examination request form and use report macros that adapt as I complete the diagnosis. The macros considerably speed up reporting, helping to avoid omissions, even if I'm interrupted when reporting. During reporting, I tag key images that will form the basis of the image set which is provided to the referring doctor or clinician. If I need to add supportive viewpoints from external sources, the integrated internet browser

"We are convinced Agfa HealthCare will be our partner on our path to the future of medical imaging."

Dr. GEERT BIEBAU, Head of Radiology

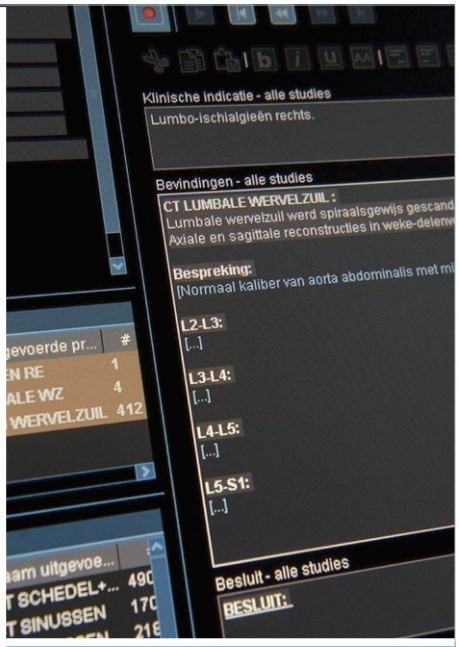
> "Macros considerably speed up reporting, helping to avoid omissions, even if I'm interrupted when reporting."
>
> Dr. FREDERIQUE VAN ROBAEYS, Radiologist

takes me to any source I want. I can then simply add files or links to my report. This is my office and I can easily take it anywhere to continue working with Sint-Rembert's server over a VPN connection."

RADIOLOGISTS NOW CONSIDERED A SOUNDING BOARD FOR CLINICIAN'S DIAGNOSIS AND THERAPY

The faster reporting speed and image support provided to clinicians has changed their working relationship with radiologists, underscores Dr. Biebau. With all images at hand, as well as those coming from the clinician's modality, the radiologist is able to interpret images from a more holistic clinical perspective. As a result, he is more routinely asked to explain his view on certain studies with his knowledge of images from other modalities. "With IMPAX Agility at hand, we are more often considered a sounding board in support of the clinician's therapeutic decision-making."

Dr. Biebau has been working with Agfa HealthCare for many years, and this relationship lets his department keep abreast of the fast technology evolution in medical imaging. "It has enabled us to improve our service and increase productivity. With IMPAX Agility we can cope with the challenge of increasingly complex imaging and software developments, such as cardio- or angio-CT, which can be easily integrated. We are convinced Agfa HealthCare will be our partner on our path to the future of medical imaging." •



> "If I need to add supportive viewpoints from external sources, the integrated internet browser will take me to any source I want. I can then simply connect either files or links to my report."
>
> Dr. FREDERIQUE VAN ROBAEYS, Radiologist

The use of macros in reports provides an examination-based template structure for the radiologist to complete his report. This offers more comfort to radiologists when picking up the report after being interrupted and ascertains the completeness of the report.

AGFA HEALTHCARE'S CONTRIBUTION

» A new intuitive image management solution that helps improve the delivery of care while reducing costs.

SOLUTIONS

IMPAX Agility

» Unifies RIS, PACS, Reporting, 3D, Connectivity and Clinical Applications
» Uses a single data model to provide a seamless system offering relevant and varied clinical data in one platform
» Supports Agfa HealthCare's vision of image management across healthcare functions
» Easily adds new applications like special visualization or MIP/MPR/3D
» Fully standards-based design (IHE, HL7 and DICOM) for integration into existing healthcare systems

DID YOU KNOW...

» With four radiologists, Sint-Rembert hospital's radiology department reported on 60,000 examinations in 2011.
» Saint Rimbert, or Rembert, was archbishop of Bremen-Hamburg from 865 until his death. Rimbert is revered as the Second Apostle of the North but his efforts to christen Denmark and Sweden suffered from resistance by the Vikings.

Technology Corner: Workflow Engines

Agfa HealthCare introduces the benefits of task-based workflow engines to medical imaging

Workflow engines are ideally suited for healthcare workflows, yet many Picture Archiving and Communication Systems (PACS) continue to use status-driven workflows – which are hard to organize, resistant to customization and inflexible to change. This means many healthcare enterprises are missing out on the advantages a task-based workflow offers. Agfa HealthCare considers that task-based workflow engines offer hospitals and caregivers the best opportunity to improve patient care and minimize operational costs.

NEW PROCESSES REQUIRE NEW TOOLS

Contemporary digital imaging has transformed the face of healthcare. But to experience all the benefits, a suitable workflow is also necessary. This is where workflow applications come in. Healthcare enterprises today need applications that organize, customize and measure. This means tools that support them in organizing work and tasks in the most efficient and cost-effective way possible; allow the workflow to be customized to the specific needs of the hospital, department or user; and offer the possibility to measure processes, so that they can be improved.

WHO DRIVES THE TASKS?

Status-based workflows simply don't meet those needs. In a status-based workflow, the user first searches for a study with a certain status, and then must determine, prioritize, organize and complete all the steps and tasks to be carried out. But the typical workday rarely runs so smoothly. As he goes about his tasks, a person is often interrupted, by colleagues, by emergencies, by new tasks that may have a higher priority… Each time, he must return to the interrupted workflow, and again determine what needs to be done.

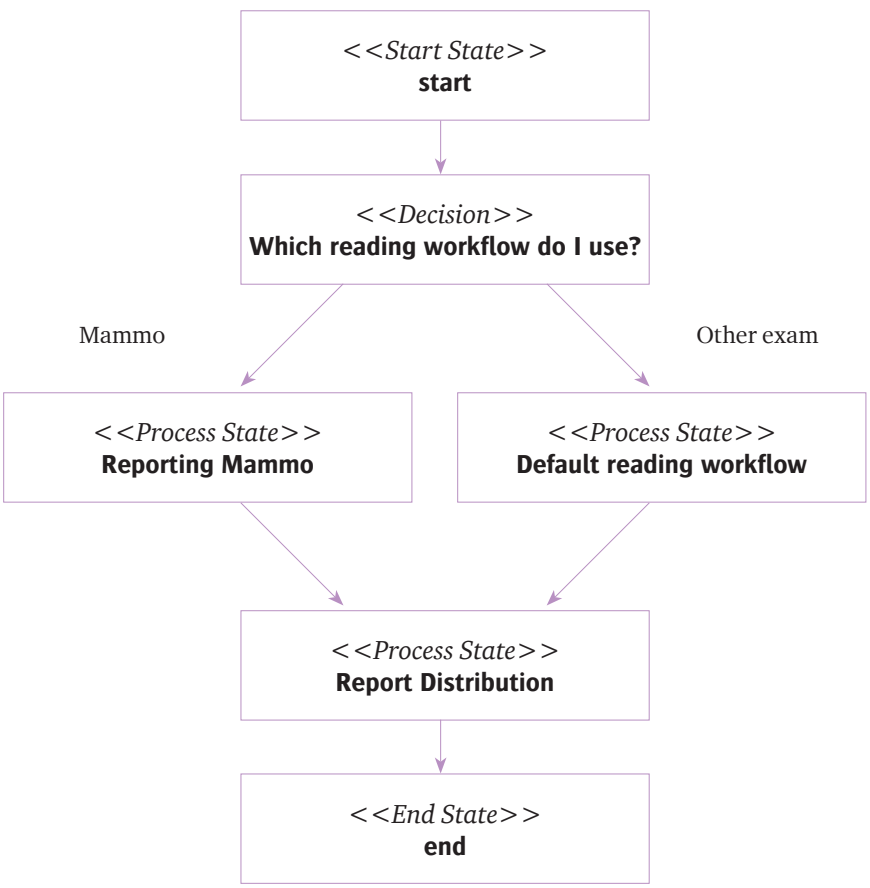
For the enterprise, there is also the risk that the individual's sense of priorities doesn't match the hospital's: who decides which tasks are most urgent? Who decides if a task has been completed? Who determines the best person to carry out a task?

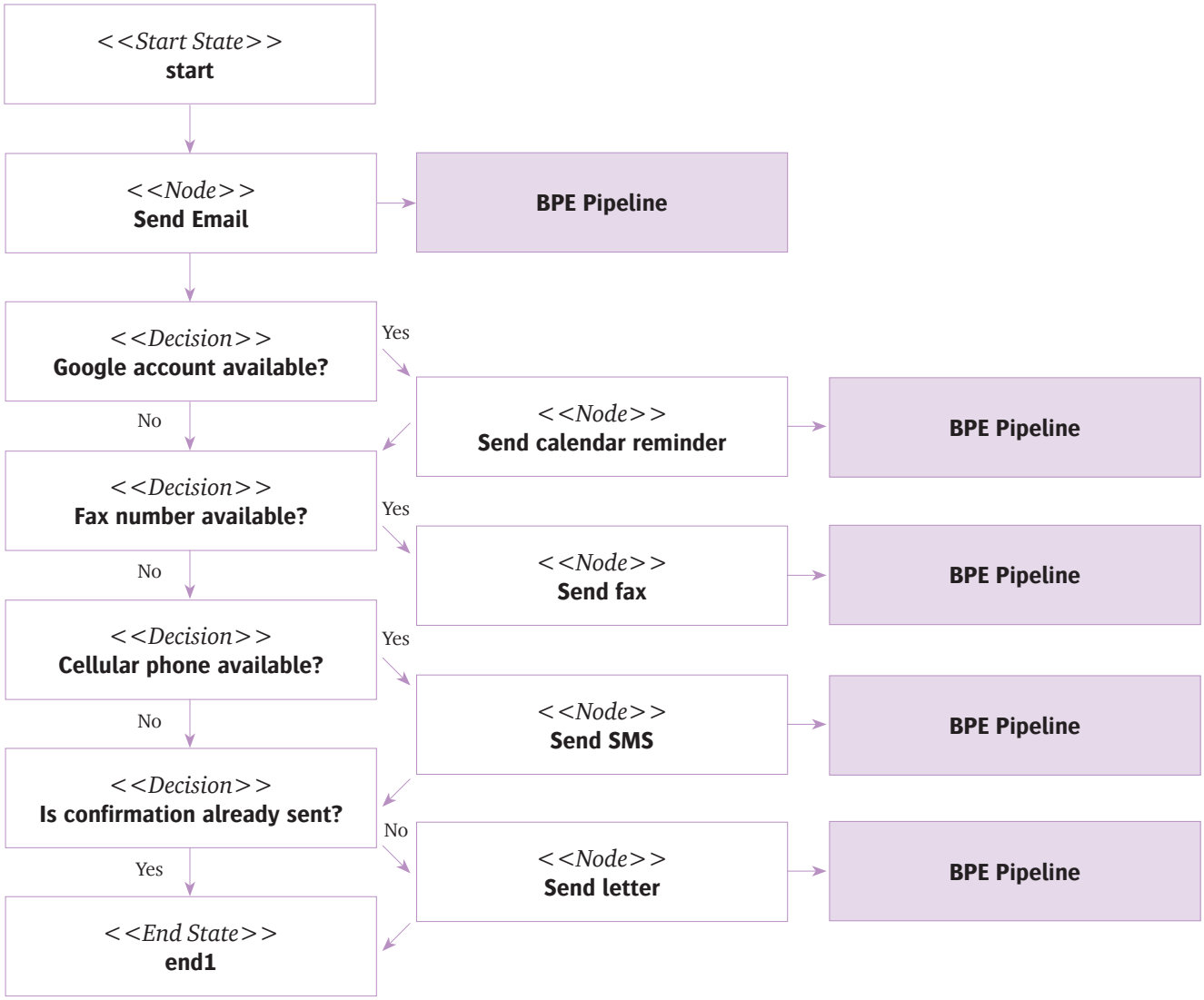
A workflow engine creates a task-driven workflow that answers all those issues, and more. Each user can create a task list for himself, organized by priority. New tasks are automatically added to the list in the correct place. So the user always has a clear and defined overview of everything that must be done. After any interruption, it is easy to return to the exact place in the list and task. The workflow engine does not consider a task complete, and remove it from the list, until all the information is available. It can even include clinical guidelines if needed. When input is required from a colleague, the user can create a task for that person, enhancing communication. And it is easier to measure how much work each person has to do, and to assign work to another person if necessary.

For the hospital, the workflow engine can enforce hospital-defined workflows, and then validate that they are being followed. This allows the enterprise to ensure that its best practices are being used correctly.

YOUR WORKFLOW IS UNIQUE

No two healthcare enterprises will use exactly the same process and rules for their workflow. One may require an extra, manual quality check before an image is sent to the Radiology Information System (RIS). In another, perhaps only radiologists may create reports.





In a status-based workflow, there is no way to configure these specifications: usually a comment is added to studies. But the workflow engine can incorporate these requirements into a customized workflow. Each unique requirement is turned into an additional step, and prioritized correctly. The specification of the person to complete the task can also be configured, and so can the priority. In fact, tasks can be prioritized depending on their purpose: a task for an emergency patient can be given a higher priority than the same task for another patient.

These customizations and specifications are configured into the workflow engine using normal, natural language. So it is easy to configure the system as needed at runtime. For example, to specify that the creator of a report needs to approve the final version of the report, the following rule might be configured: "each approval task is assigned to the creator of the task." The engine itself turns the natural language into the technical format and applies the rule.

CONTINUOUS IMPROVEMENT IS A MUST

Healthcare enterprises are committed to continuously improving processes, to enhance care and control operational costs. But status-based workflows do not support change, as they create rigid, rather than flexible, workflows. With a workflow engine, the hospital can easily measure the efficiency of its processes, and then change the workflow configuration to optimize them. All kinds of measure points can be used, interpreted and compiled into reports. And the hospital can monitor the evolution of its processes, keeping it agile and responsive to changing needs and regulations.

WORKFLOW ENGINES IN PRACTICE

With all the benefits of workflow engines, Agfa HealthCare is committed to introducing them into the medical imaging domain. Solutions like IMPAX Next Generation and IMPAX Agility use powerful task-based workflow engines that help to ensure that users follow the appropriate steps for the procedure, circumstances and, most importantly, their own workflow.

This supports the hospital in meeting regulatory obligations and workflow best practices, as well as improving communication.

Radiology
without boundaries

Agfa HealthCare's Regional Health portfolio provides radiologists and clinicians with seamless access to the patient's entire radiology history, irrespective of the originating radiology department, making medical images available across all clinical disciplines as part of the patient's comprehensive medical record. Moreover, our solutions enable sharing of longitudinal imaging records by connecting third party RIS/PACS systems across all facilities via federated and centralized approaches utilizing state-of-the-art industry standards and techniques allowing an 'acquire anywhere – report from anywhere' workflow.

Insight. Delivered.

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