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Digital pathology efficiently fosters diagnostic accuracy and improved collaboration at Hallym University Medical Center

Digital Pathology
Customer story



The transformation to digital pathology at Hallym University Medical Center

Who

Mr. Taehwan Jung, Digital Innovation Team, Hallym University Medical Center
Professor Eun Shin, Department of Pathology, Dongtan Sacred Heart Hospital

Where

Hallym University Medical Center, Seoul, Korea

Challenge

Updating pathology capabilities across four hospitals at once to increase image sharing, consultation, diagnostic confidence and workflow efficiency

Solution

Centralized management through a single platform for all pathology slides across four hospitals with improved network consultation, standardized pathology operations, automated workflows and AI-based analysis for rapid diagnostic support

How do you unite four physical locations in the transition to digital pathology so that operations are standardized, collaboration is increased, efficiency is improved and diagnostic confidence is enhanced? This was the challenge facing Hallym University Medical Center in Seoul, Korea. The teams knew that the time had come to move from analog digital pathology, and they searched for a partner with the experience and capabilities to help make the digital transition a success.

Background

Under the institution's former analog pathology system there was difficulty in tracking data due to paper-based slide management. The analog system also hindered pathology image sharing and consultation systems among hospitals, and it limited remote diagnosis capabilities and created a lack of standardization in diagnostic processes.

The institution searched for a digital pathology solution it could use across its four hospitals (Hallym University Sacred Heart Hospital, Kangnam Sacred Heart Hospital, Chuncheon Sacred Heart Hospital and Dongtan Sacred Heart Hospital). Hallym University Medical Center chose Philips, and its digital pathology system has been in full production across all four hospitals since March 2025. After an initial pilot operation, the majority of pathology diagnoses are now performed through the digital platform, leading to improved collaboration, more efficient workflows and increased diagnostic confidence.

Results

- Centralized management through a single platform for all pathology slides from the four hospitals
- Network consultation has improved diagnostic accuracy through inter-regional collaboration
- Standardized pathology operations and automated workflow have increased efficiency
- AI-based analysis allows for rapid diagnostic support using morphometric AI

A unified digital pathology network with multiple clinical, operational and financial benefits

Connecting four hospitals through one unified digital pathology network has produced positive results, says Mr. Taehwan Jung of the Hallym Digital Innovation Team.

"We have enhanced clinical collaboration, and our clinicians are able to provide rapid response to rare cases and complex cases through seamless consultation among specialists from the four hospitals."

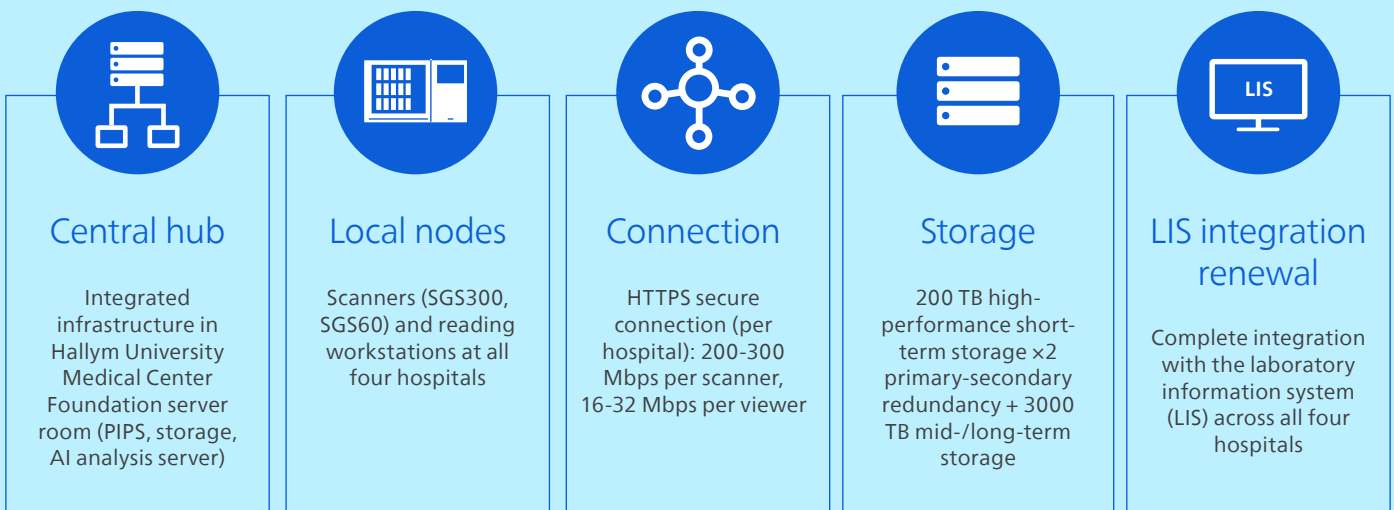


Mr. Taehwan Jung, Digital Innovation Team, Hallym University Medical Center

Mr. Jung says that the digital pathology solution also helps optimize healthcare resources through a centralized infrastructure that avoids the need for duplicate investments in expensive equipment, reducing operating costs. Standardization increases diagnostic consistency because all four hospitals use the same digital pathology platform and AI tools.

The integrated database facilitates data-driven management for clinical trend analysis and pathology research. The patient journey is improved through the complete tracking of diagnostic history during patient transfers, preventing duplicate diagnoses. The platform's scalability allows for the application of new technologies such as AI and machine learning across all four sites.

Fully networked digital pathology lab architecture at Hallym University Medical



“Since the introduction of digital pathology, the diagnostic process has been systematically improved, and we are experiencing both workflow improvements and improved diagnostic confidence.”



Professor Eun Shin, Department of Pathology, Dongtan Sacred Heart Hospital

Supporting fast, confident diagnosis

Professor Eun Shin of the Department of Pathology explains how the solution is helping clinicians speed time to diagnosis while enhancing diagnostic confidence. She points out that the transition from paper-based slide management to a digitized system has made slide retrieval and storage much easier, and that high-resolution digital images enable clearer observation of detailed structures than before. There is also no longer the need to search for or carry physical slides, which increases workflow efficiency. The standardization of digital images allows for greater consistency, with the same observed results across repeated reviews. “The high-magnification zoom functions (zoom-in/out) enable detailed examination of fine structures, and the team finds that it is easier to maintain diagnostic accuracy without the physical fatigue caused by microscope use,” said Professor Eun Shin.

Improved cross-department collaboration

Integration with the laboratory information system (LIS) has substantially improved collaboration between pathology and clinical departments. Information is now more accessible. In fact,

clinicians can now access pathology diagnostic results through the LIS whenever needed. Communication is improved, and consultations that previously required phone calls or direct visits can now proceed more systematically through digital platforms.

Emergency response is also improved, because the system is able to respond quickly when pathology results are needed in urgent clinical situations. Now clinicians at each hospital can easily consult with pathology specialists at other hospitals, which is particularly useful when gathering multiple expert opinions on complex cases. All four hospitals use the same digital platform, improving consistency of diagnostic criteria. “Digital pathology implementation is not just technology adoption but a change in diagnostic culture. Our Dongtan Sacred Heart Hospital is currently in this process, and we expect to produce better results going forward. If other hospitals fully understand this change process and proceed step by step with a reliable partner, they will be able to achieve good results,” said Professor Eun Shin.

Transformation journey timeline

The digital pathology system has been in full production across all four hospitals since March 2025. The entire process through the pilot stage lasted approximately 21 months.



The benefits of leaving the microscope behind

Professor Shin points out that under the previous analog system, clinicians had to visit the pathology department in person to view slides, and that meetings with a pathologist were necessary to seek explanations. Remote examinations using the latest systems were not possible, and information sharing was irregular. Now remote consultation across the four hospitals is routine. Dermatologists and other clinicians who frequently need to review pathology slides can now open slides from their own clinics offices whenever needed, and can leave asynchronous comments using memo and annotation features on the digital platform. All of this has made diagnosis easier and faster, and the ability for rapid response to emergency cases. Specialists from all four hospitals can simultaneously participate in reading a case.

The institution is seeing improved diagnostic outcomes through increased sharing of information. During less than one year of operation, Professor Shin has observed the following positive changes: an increasing trend in case consultation, establishment of a multi-expert review system for rare case diagnoses and enhanced clinician satisfaction. Digital-based operations are becoming established, with standardization of pathology team operations and confirmation of ongoing system stability.

Increased productivity through morphometric AI

Professor Shin says that morphometric AI is used as an assistive tool to support the pathology team's diagnoses. Currently, a Ki-67 labelling index morphometric AI algorithm is used to help more accurately assess proliferative activity, which supports evaluation of tumor malignancy across several cancer types and helps in estimating the likely response to anti-cancer therapy in certain cancers such as breast cancer.

In addition, morphometric AI is also being used to support the interpretation of immunohistochemical markers such as ER, PR and HER2, which provide important information for determining the course of breast cancer treatment.

With AI, repetitive measurement tasks can be automated, allowing pathologists to spend more time on the diagnostic process itself. In addition, objective quantitative values that help reduce variation between observers contribute to improved consistency in diagnoses.

“The combination of digital images and AI analysis is having a positive impact on diagnostic quality through repeatable review, during which the same image can be reviewed multiple times, improving diagnostic accuracy.”



Professor Eun Shin, Department of Pathology,
Dongtan Sacred Heart Hospital

With AI, joint review is easy. Multiple pathologists can simultaneously view and discuss the same image. In addition, all aspects of the diagnostic process are automatically captured for future reference, preserving the record.

Diagnostic standardization is being achieved as all four hospitals use the same system, so patients can expect a consistent level of diagnostic quality no matter which hospital they visit. High-resolution digital images have made detailed observation clearer, and the objective quantitative values provided by AI have further strengthened the evidence base for diagnosis.

Professor Shin notes that AI does not replace pathologists' professional judgment, and the final diagnosis remains the responsibility of the pathologist. “AI's assistive function is particularly meaningful in borderline cases where the diagnosis is not clear. In some cases, the pathologist's experiential judgment may be more accurate than AI results,” said Professor Shin.



How Hallym University Medical Center eased the transformation to digital pathology

Systematic training, deployment of a change management coordinator and phased implementation helped overcome reservations of pathology teams accustomed to paper-based operations. Close collaboration with the Philips technical team and pre-compatibility verification helped harmonize the various pathology workflow patterns across the four hospitals. Complete digitization of block and slide management helped mitigate any confusion during the transition process from paper to digital workflow.

To ease the burden of data migration, new cases are digitized first, while important past cases are scanned as needed. Various security solutions are in place, including access control and SSO, regular monitoring and auditing, which help preserve patient medical data protection and regulatory compliance as specified in the Medical Act, Information and Communications Network Act.

Initial network speed and storage performance issues were overcome with network infrastructure improvement, implementation of high-performance short-term storage, and a redundant configuration for service data and short-term image data storage.

The solution required large-scale IT infrastructure investment, which was addressed through a phased investment plan and business case validation through return on investment (ROI) analysis.

Philips as a partner for digital transformation

Professor Shin expresses a high level of satisfaction with the partnership with Philips. Philips responds quickly to any system issues through its dedicated technical support team, and in addition to the initial training for the pathology team, provides follow-up training sessions whenever needed.

"The Philips team actively listens to our feedback," she says. "System stability is solid, and the system has not experienced any major failures." Professor Shin expects that AI capabilities will be further enhanced through continuous technological innovation. The company has the experience and capability to successfully manage the complex project of connecting four hospitals on a single platform, with a commitment to ongoing support that goes beyond the initial implementation to include long-term operation and technological innovation."

"Our key reasons for choosing Philips are end-to-end integrated solutions and reliable technical support. Philips provides a consistent platform from scanners to software to AI, minimizing system compatibility issues."



Professor Eun Shin, Department of Pathology, Dongtan Sacred Heart Hospital

She continues: "We judged that the Philips AI algorithms* and scanner performance could meet our requirements, and we expected that diagnostic standardization would be possible as pathologists from all four hospitals use the same platform." The stability and reliability that Philips brings as a global medical device company, along with reference implementation cases from major domestic and international medical institutions, boost confidence.

* PIPS enables iSyntax files and with the Software Development Kit (SDK) third-party companies can use this for AI capabilities.

Advice for other hospitals interested in digital pathology transformation

Professor Shin shares five areas of consideration for success in digital transformation.



1. Clearly set specific goals.

Rather than simply saying "We need to go digital", it's important to set clinically specific goals. Some examples of this are "Building a consultation system", "Diagnostic standardization" or "Strengthening clinical collaboration". Focus on goals that can be agreed upon by both management and medical staff.



2. Choose a reliable partner.

Evaluate not only technical capabilities but also long-term support capabilities. Confirm capabilities for operation, maintenance and technological innovation, not just initial implementation. If possible, validate through a pilot project before large-scale implementation.



3. Invest in adequate change management.

Technology adoption alone cannot guarantee success. The pathology team's mindset and understanding are most important. Provide sufficient training and psychological preparation and recognize the importance of a process to understand and overcome initial resistance or anxiety.



4. Take a long-term perspective.

Rather than thinking "We need to see results within one year", approach clinical transformation from a three- to five-year mid-range perspective. Allow the time needed for sufficient clinical data to be gathered and workflows to be optimized.



5. Systematically collect user feedback.

Regularly listen to the pathology team's opinions after implementation. Feedback from day-to-day users can provide the most valuable points for improvement.

The future of AI in digital pathology

Professor Shin expects that, as AI technology advances, its range of applications will expand so that it can support treatment decisions in more cancer types. The institution is further developing its systems for clinical collaboration, including regular image-based conferences that use digital slides to make it easier for clinicians to access pathology diagnoses. Professor Shin also expects that the digital diagnostic data accumulated in this way will enable more clinical research in the future.

Professor Shin anticipates the following changes in pathology with the advancement of AI: "In the short term (2-3 years), we expect AI to further strengthen its role as an assistive tool for pathologists, with objective measurement functions that will continue to improve, contributing more to diagnostic consistency,"

"Within 5-7 years, we think that as various AI algorithms are developed, we will see evolution toward synthesizing results from multiple AIs, leading to more systematic collaboration between AI and pathologists. The assistive role of AI in diagnosing difficult cases or new diseases will become increasingly important."

"In the long term (10+ years) AI technology will continue to advance, but final diagnostic responsibility will still rest with pathologists. Their professional judgment will remain essential, especially for complex cases, new diseases and exceptional situations. The ability of pathologists to interpret and utilize information provided by AI will become increasingly important," says Professor Eun Shin.

Conclusion

Hallym University Medical Center is using the transformation to digital pathology to centrally manage all pathology slides across its four hospitals, with network-based consultation that improves diagnostic accuracy and increases clinical confidence.

Efficiency has improved through standardized pathology operations and automated workflows, and morphometric AI analysis now provides accurate diagnostic support. These changes are enhancing the experience for patients, clinicians and pathologists alike.

Talk with your Philips representative about the transformation to digital pathology today, or visit www.philips.com/digitalpathology

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