Committed to offering the highest standard of treatment, Seoul National University Bundang Hospital (SNUBH) has consistently been at the forefront of new medical technology advancements. As the healthcare paradigm shifts to an evidence-based model, SNUBH turned to the SAP HANA® platform to help automate its clinical indicators system and gather critical data in real time.
Executive overview

BUSINESS TRANSFORMATION

The organization’s top objectives
• Improve management and monitoring of 320 clinical indicators
• Provide physicians access to relevant data in real time
• Ensure researchers have fast, easy access to historical data

The resolution
• Ran proof-of-concept tests with numerous vendors and selected SAP for its superior in-memory computing technology
• Built a clinical in-memory data warehouse on the SAP HANA® platform
• Created a separate data mart to catalogue clinical indicators

The key benefits
• Cut access time to key medical and research data from days to seconds
• Improved patient care and shortened inpatient hospital stays
• Reduced researchers’ reliance on IT staff for data retrieval

“Managing clinical indicators and pulling relevant information out of a huge data warehouse is critical. With that data, doctors can ensure the correct treatment is prescribed and monitor results.”

Soo Young Yoo, PhD, Assistant Research Professor, Center for Medical Informatics, Seoul National University Bundang Hospital
Increasing efficiency and improving patient outcomes

As one of South Korea’s leading medical centers, Seoul National University Bundang Hospital (SNUBH) has demonstrated a firm commitment to advancing care through its use of technology, digitizing all its health records as early as 2003 and launching a health information exchange in 2006. As medical care continues its move to an evidence-based model, Big Data is playing an increasingly critical role. Recognizing this transformation – and the limitations of its existing data warehouse – the hospital set out to create a system that could provide optimal patient care and clinical research.

To start, SNUBH needed a way to enhance patient safety and improve tracking of 320 clinical indicators, including antibiotic usage rates, transfusion measurements, and physicians’ charts. Access to these indicators, which are a critical element in delivering and monitoring patient outcomes, was becoming increasingly difficult and time consuming. Another challenge for the hospital was accelerating data retrieval, since gathering information from as recently as three months prior could take up to an hour.

Hospital researchers were also struggling with limited access to historical clinical data, some of which had been inputted through free text, making it hard to identify and retrieve critical patient records. To test a hypothesis and develop evidence, researchers needed access to massive amounts of historical data – a process that often required engaging with IT staff and waiting days, or even weeks.
Deploying a new data warehouse for improved performance

To strengthen its patient care, SNUBH reevaluated its IT infrastructure and explored a new data warehouse system that could support Big Data and deliver real-time performance. After running proof-of-concept projects with several different providers, the hospital determined that only the SAP HANA® platform offered the speed and precision it required. With this decision made, SNUBH implemented a 10 TB in-memory clinical data warehouse using the SAP HANA platform, which rapidly processes and analyzes information related to patients, including medical records, physician comments in text data, nursing records, prescription data, and sensor and bar code information from medical devices. To catalogue and analyze its 320 clinical indicators, the hospital deployed a separate data mart that automated and streamlined management. Thanks to the low latency of SAP HANA, the hospital was able to provide instantaneous feedback to clinicians, who were then able to check specific indicators, compare their actual status against predefined goals, and make adjustments as needed.

With SAP HANA, SNUBH researchers, physicians, and nurses could now analyze data in near-real time by using business intelligence tools and without assistance from IT staff. The transition to SAP HANA proved to be a timely, efficient process, with the deployment of the new clinical warehouse occurring in only 12 months.
Automating data analysis and streamlining access

By running its new clinical data warehouse on SAP HANA, SNUBH significantly improved how it accesses and uses clinical indicators. Today, the hospital manages 320 clinical indicators with only six nurses – compared to as many as 100 caregivers in a hospital of similar size in the United States. In addition to freeing up staff resources, retrieval time frames were also drastically cut from one to two months before SAP HANA to a remarkable one to two seconds after the implementation. And for the first time, SNUBH can provide multidimensional analyses based on a number of variables, including patient characteristics, disease, and location.

The benefits of deploying SAP HANA also extend to the research department. Now, researchers can access all data in seconds or minutes – not hours, days, or weeks. And thanks to simple query tools, researchers no longer need to regularly engage with IT staff, helping them to stay focused on their vital work.

**KEY BENEFITS**

- **<2 seconds**
  To analyze quarterly data, compared to 1 to 2 months

- **147%**
  Return on investment within 5 years, according to PricewaterhouseCoopers

- **1 day**
  Reduced antibiotic cycle for preoperative patients from 6 days to 1 day, minimizing overprescribing

- **700X**
  Faster retrieval of up to 10 years of research data

- **6 nurses**
  Can manage 320 clinical indicators
Strengthening a commitment to next-generation research

Moving forward, SNUBH will remain focused on technology innovations that enhance its clinical data warehouse powered by the SAP HANA platform. To improve clinical research analysis capabilities, the hospital plans to support both scenario-based and text-based searches. SNUBH is also laying the foundation for an enhanced clinical indicator review in an effort to gain deeper insights into infection management. In addition, SNUBH is exploring the SAP® BusinessObjects™ Business Intelligence suite for more advanced business analyses.