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Case Study

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## Peking Union Medical College Hospital Achieves Clinical Excellence through Lab Consolidation and Automation

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## Peking Union Medical College Hospital Achieves Clinical Excellence through Lab Consolidation and Automation

Founded in 1921, Peking Union Medical College Hospital (PUMCH) is an integrated clinical, teaching, and research center, and an undisputed leader in China. With 1,800 beds and an outpatient volume of 10,000 a day, PUMCH is a training ground for China's distinguished clinicians, healthcare administrators, and medical researchers. The Department of Laboratory Medicine, established in 1958, is evolving into an international center of excellence. Its core lab received ISO 15189 accreditation in 2008.

Patient satisfaction has always been a primary focus for the hospital. "From a patient care perspective, quality, TAT [turnaround time], and service are paramount. We are also mindful of staff training, career development, and job satisfaction. An additional and increasingly important consideration is cost efficiency," says Dr. Qiu Ling, Vice Director, Core Laboratory.



Dr. Qiu Ling discussing the solution value during a visit by Dave Hickey, CEO, CAI, Siemens Healthcare Diagnostics, Inc.

### The strategic vision

For PUMCH, embracing technology and leveraging advances in automation are key to maintaining clinical leadership and meeting the patient care demands of a large hospital. The planned installation of two ADVIA WorkCell® automation lines is a milestone. It is also the culmination of collaboration with Siemens Healthcare Diagnostics that began in 2003 when the first Dimension® RxL Max® Integrated Chemistry System was installed with the goal of elevating quality, speeding up time to results, enhancing staff productivity, and increasing cost efficiency.

A key strategy is to consolidate the large number of labs within the hospital. Currently, Laboratory Medicine operates eight labs, including a core lab that handles 80 percent of all tests and a STAT lab located in Emergency Medicine. An additional 20-plus labs are located within clinical departments. There are many reasons for consolidation. First, the sheer number of labs makes quality management a challenge. With the focus on seeing patients, there is little opportunity for staff training in labs attached to clinical departments. Once patient testing is moved over to the new automation lines, clinical department labs will be able to focus more on supporting research.

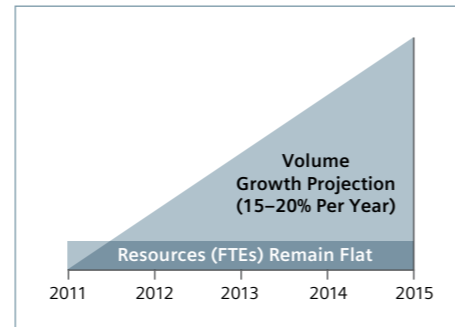
"Another reason for consolidating the many labs around the hospital is to make it easier for patients, vendors, and patient specimen couriers to find us—but of course consolidation also has important ramifications for workflow and quality improvements," says Dr. Xu Ying Chun, Chair, Department of Laboratory Medicine.

**Market needs.** Although patient volume has stabilized, testing volume is growing at about 15 to 20 percent per year due to the availability of new analytes (e.g., troponin), as well as increasing demand for preventive care. Laboratory Medicine also plans to launch outreach programs to support nearby clinics as well as reference lab services. In all cases, the overriding factors are quality, TAT, and convenience for patients.

"Delivering accurate results is our obligation to the patient," Dr. Qiu says.

**Meeting the challenge.** Automation has a key role in meeting the demands of increasing volume and speed while ensuring quality within cost constraints. It also frees staff time for more challenging tasks, and allows more flexibility to match responsibilities with individual talent. This allows PUMCH to realize its holistic approach to lab operations.

"We need to think beyond automation and look at process improvements through workflow design and use of IT to supplement human resources. The automation lines are part of this vision," Dr. Xu says.



Transforming the lab to seamlessly cope with growth

### Dimension Systems at PUMCH

PUMCH's emergency room (ER) has a heavy patient load of 300 to 400 a day. ER physicians rely heavily on a broad range of lab tests in patient care, including coagulation, electrolytes, liver function, kidney function, cardiac markers, D-dimer, and infectious disease testing, all of which are performed in the STAT lab adjacent to the ER.

In 2003, the first Dimension Integrated Chemistry System was installed, followed by a second unit in 2005. The choice of the Dimension systems is based on specific ER needs. TAT is critical, not only to make sure patients are treated in a timely manner but also to optimize throughput. Quality is a given at PUMCH. Round-the-clock operation is the hallmark of an ER. Hence ease of use is a necessity, since skilled operators are not always available on all shifts. With limited space in the ER, a system that has a broad menu is an advantage.

### The move to automation

Choosing an automation solution is complex. PUMCH considers many criteria. First is quality. Assay performance is evaluated in PUMCH's own lab and complemented with CAP survey results as well as the experience of other labs. Speed is important, considering the TAT goal of two hours for routine tests and a peak volume of 1,500 specimens per day. A third factor is cost. Another is harmonization—the overall comparability of results from different platforms. And last but not least are the menu and the expected rate of introduction of new assays.



"Siemens will be our partner in maximizing utilization of the new automation lines. Training will help shorten the learning curve and overcome the fear of change as we embrace and exploit new technology to the benefit of our patients and our staff."

Dr. Xu Ying Chun, Chair, Department of Laboratory Medicine

"There are three guiding principles in our selection process. First is to base our decision on accurate, validated information. Second is to make sure the solution fits our needs—we want the appropriate solution and not the most or least costly. Third is service. The service provided by our vendors will directly impact our ability to care for our patients," Dr. Qiu says.

In this context, service and support go beyond field service responsiveness, parts availability, time to problem resolution, and reliable reagent delivery; they also include consultation (e.g., in lab layout and workflow design), training (on-site training, online training, and symposia), and the commitment to continue to innovate.

"Siemens will be our partner in maximizing utilization of the new automation lines. Training will help shorten the learning curve and overcome the fear of change as we embrace and exploit new technology to the benefit of our patients and our staff," Dr. Xu says.

### A look into the future

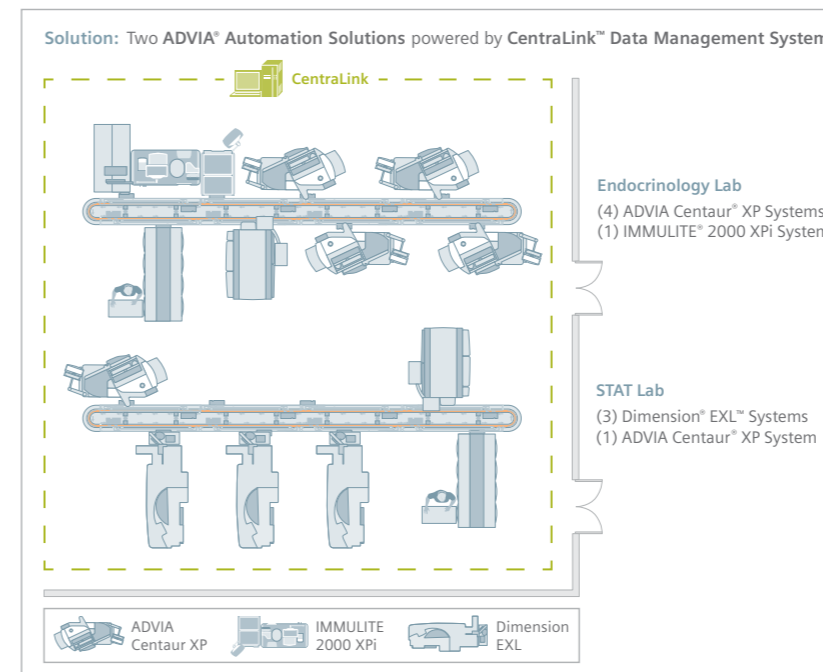
The Department of Laboratory Medicine at PUMCH is embracing new developments and actively integrating them into clinical care and research. From this perspective, automation is an enabler that will free up valuable human resources for the challenging work ahead. The new automation solution will vastly expand test capabilities, elevate quality, and improve cost efficiency. Menu consolidation and more efficient handling

of primary tubes will reduce sample handling errors and the amount of blood drawn, increasing patient satisfaction.

The move toward standardization in patient care through defined clinical pathways will streamline the process of test ordering and reduce unnecessary testing, thus decreasing healthcare costs.

With an infrastructure that is more connected both physically and electronically, Laboratory Medicine will enhance its traditionally close working relationship with clinicians, getting results to them faster and engaging them in exploring new frontiers in clinical diagnostics.

"Siemens has performed well in different areas of our hospital and earned our trust. I fully expect a pleasurable collaboration in the future." Dr. Xu says.



\*The outcomes achieved by the Siemens' customer described herein were achieved in the customer's unique setting. Since there is no "typical" laboratory and many variables exist, there can be no guarantee that others will achieve the same result.



PKU continues to explore new testing capabilities