

Memorial Health System improves patient safety and streamlines physician order routing system with a solution from Lexmark that uses MFPs and Lexmark's Document Solutions Suite.

## Memorial Health System improves patient care and operational efficiency with Lexmark physician order routing system

### The Organization

Memorial Health System operates three major hospitals and four other centers in the greater Springfield, Ill. area. Its hospitals include Memorial Medical Center, Taylorville Memorial Hospital and Abraham Lincoln Memorial Hospital. Combined, the hospitals have about 575 licensed beds and care for about 25,000 inpatients each year. Its mission is to help maintain, restore and improve the health of the people and communities it serves.

The Memorial Health System has earned many distinctions including the VHA Leadership Award for Supply Chain Management Improvement – a distinction given to only 23 healthcare providers in the nation. Memorial Hospital has also been recognized as a Magnet hospital – the highest level of recognition from the American Nurses Credentialing Center.

### The Challenge

Hospitals today face many conflicting missions: addressing the growing need for healthcare services, maximizing operational efficiency and improving quality of patient care, all while controlling the increasing cost of care and facing the declining reimbursements from Medicare/Medicaid and private insurers. The affiliated hospitals of the Memorial Health System are no exception and face these same business and operational challenges.

At Memorial Medical Center, nursing stations had become cluttered with laser printers, fax machines, copiers and old-fashioned dot-matrix printers from an assortment of vendors. The number of individual devices grew to more than 120, representing 21 models from seven different manufacturers. Many of them were covered under separate maintenance agreements which made it difficult and costly to keep up with device maintenance. Keeping this fleet of

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–Stephen De Pooter  
Manager of Clinical Systems  
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devices running and an inventory of necessary toner cartridges for all of them had become an expensive, time-consuming and convoluted proposition. Nurses were spending too much time with equipment and paperwork and needed more time with patients.



Memorial had long been using a pre-printed physician order routing system that Stephen De Pooter, Manager of Clinical Systems, characterized as antiquated. Routing the duplicate and triplicate forms was slow, and these copies, whose legibility depended on the impact strength of the dot-matrix printers, were not up to par. “This system used multipart forms printed on dot-matrix printers,” he said. “The printers were noisy and the pre-printed carbonless forms were very expensive and were easily marked with unintentional errant marks which introduced a patient safety concern.”

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—Kristen Lee  
IT Project Manager

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In its first attempt to improve service levels, Memorial decided to use a solution that required a dedicated PC and scanner at each nursing station. This solution quickly developed problems related to reliability, according to Alisa Groesch, Memorial’s Director of Pharmacy.

“These scanners were not durable enough to keep up with our 1,600 orders a day and they were very finicky; the paper needed to be aligned just so,” she said. “We were spending too much time caring for the technology,” she said.

Though scanning by nurses did speed the traditionally paperbound process, a new problem appeared. Images created from the multi-part carbonless paper forms were not always legible. Physician orders would arrive in the pharmacy system frequently littered with text-obscuring speckles and streaks, said De Pooter. Combined with the sometimes faint text of the carbonless forms and the possibility of errant markings, pharmacies found themselves in a quandary. To avoid potential safety issues brought on by misinterpretation, pharmacists often had to call the nurse who faxed the order for clarification, introducing delays that offset other gains.

In 2005, Memorial Health System launched an initiative to enhance patient safety by replacing the pre-printed order application and removing the dot-matrix printers and multi-part forms from production. A number of projects were initiated with this goal in mind,

including revamping the hospital’s physician order routing procedure to reduce the time, hassle and cost of getting physician orders sent to the pharmacy and fulfilled. Although improvements were needed, hospital administrators also knew that the new system could not impact any existing clinical processes. Changes would have to be virtually invisible to clinicians.

### **The Solution**

The hospital’s IT department began its research to find the ideal solution for Memorial Health. “Clearly, we needed a better solution, one that would consolidate devices, handle the special requirements of physician order routing and provide the sharp, high-quality imaging necessary in a healthcare environment,” said De Pooter.

De Pooter and his team visited several hospitals to see other best-of-breed solutions and evaluated products and offerings from several vendors, including Xerox and Lexmark. After a rigorous evaluation and business case analysis, Memorial Health chose a comprehensive physician order routing system from Lexmark.

Based on Lexmark’s Document Solutions Suite (LDSS) and Lexmark multifunction printers (MFPs), nurses can now scan physician orders at high resolution and route them directly to the pharmacy to be viewed electronically by pharmacists at their workstation. The orders are placed in the auto-document feeder of the Lexmark MFP. Then, the nurse presses a single “scan to pharmacy” icon on the MFP touchscreen. At the same time the order is routed to the pharmacy to be tracked and archived, two copies are printed on the Lexmark MFP and placed in the patient’s chart and Kardex by the nurse.

Memorial replaced all its disparate printers, faxes, copiers and scanners with a single space-saving Lexmark MFP in each nursing station. Once cluttered nursing stations now feature one output device, instead of four, saving considerable space, reducing costs and streamlining maintenance.

To assure continued transparent interoperability with Memorial’s Cerner patient information system, Lexmark crafted a custom conduit in just a few days, using the powerful scripting capabilities of LDSS. The all-digital process eliminates the speckles and streaks that routinely obscured portions of orders sent via fax.

Barcodes on the orders accurately identify the patient and automatically pull critical information from the Cerner EMR system. The patient's name, ID number and date of birth are automatically populated so that STAT and pediatric orders can be sent to the queue and be displayed separately. In fact, pediatric and STAT orders automatically display as a different color on the queue so they can be identified and filled immediately, rather than waiting in the general queue.

"Prior to the Lexmark solution, we had to manually key in every patient identification number on each order and then verify it for accuracy," said Groesch. "The new approach is saving us a considerable amount of time and assures accuracy."

Implementation was all but invisible to Memorial's clinicians and staff – exactly as intended. "Our nurses continued their daily workflow with a nearly identical procedure on different hardware," said De Pooter. Now Memorial Health System has one vendor, one device type, one service provider, and one type of toner to stock. "The elegance of this solution is its simplicity," said De Pooter. "We have simplified the order routing process from beginning to end."

Once the solution was installed, new uses and ideas began to surface and be suggested by nurses and pharmacists. Now, if a pharmacist has a question about an order, he or she can automatically send the order back to the nurse who sent it with the question noted, eliminating the need for a phone call.

"Very few vendors truly listen to fully understand what we really need," said Kristen Lee, IT Project Manager. "Lexmark adjusted its products to work the way we do, not the other way around. And, when we want additional functionality, the answer we most often hear is 'We can do that!'"

### The Results

Cutover to the new all-Lexmark system was accomplished in a single day. "Pharmacists and nurses have really embraced it," said De Pooter. "With just a single touch nurses can scan orders to the pharmacy and they no longer have to worry about the equipment."

Thanks to its single-touch simplicity of operation, training for clinical staff was minimal. Even so, Lexmark field engineers and Memorial IT staffers spent two days doing around-the-clock grand rounds,

soliciting questions and feedback from both day- and night-shift employees.

"This was one of the smoothest 'go-live' projects we've ever had," said De Pooter. "There were simply no questions. People were excited and very pleased with the new software, hardware and the smooth roll-out."

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—Donna Crompton  
Director of Nursing, Clinical Operations and Informatics

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With its multivendor array of devices retired, Memorial now has a single fleet of output devices that is covered under a three-year maintenance agreement, simplifying device maintenance for the hospital. In addition, since all of the devices use the same toner cartridge, maintaining an expensive inventory of many cartridge types is no longer necessary. To assure high-quality output and to protect its investment in Lexmark MFPs, Memorial uses only genuine Lexmark toner cartridges.

In addition, the physician order process is now the same throughout the hospital. Every nurse's station has the same equipment, making it easy when nurses transfer to a new unit or fill in on other floors. As for reliability, Memorial's Groesch is more than satisfied. "We've found the Lexmark MFPs to be a very easy to use and durable solution. Standardization on a single Lexmark MFP has simplified many processes for our nurses and pharmacists."

"The overall impetus for this project was patient safety," said Donna Crompton, Director of Nursing, Clinical Operations and Informatics. "There were so many opportunities for errors in our previous process."

Errant marks on the multipart paper were a major problem for nurses caring for the patients. They received the "copy" of the order while the original was scanned. Now with the Lexmark solution when the order is scanned to pharmacy it prints out a copy for the nurse. The original document still goes in the chart, but the nurse is working from an exact copy of the original order. "This process is much safer for patients, and much easier for staff," said Crompton. "It's a win-win situation."

For De Pooter, Lexmark's healthcare industry experience has been a significant advantage. "Lexmark understands the complexities of large healthcare centers," said De Pooter. "Its physician order routing system has been proven in other hospitals and we knew it would be an ideal solution for us. The Lexmark MFPs and software have given us functionality and benefits in ways that we did not imagine at the beginning of this effort."

Providing world-class medical care is a long standing tradition for the hospitals of the Memorial Health System. Through its Lexmark physician order routing solution, that tradition is now delivered faster and more economically than ever before. That is a prescription for success.

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