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Case Studies

## Children's Mercy Hospitals & Clinics: *Combining Specialty Care with Cutting Edge Technology*

### Overview

Children's Mercy Hospitals and Clinics of Kansas City, Missouri has been the pediatric provider of choice for families throughout Kansas and Missouri since its founding in 1897. Two sisters, Dr. Alice Berry Graham, a dentist, and Dr. Katherine Berry Richardson, a physician, established the Free Bed Fund Association at that time to provide compassion and medical expertise to underprivileged children.

Today, the Children's Mercy healthcare system includes a state-of-the-art 194-bed hospital in Kansas City, outpatient clinics in midtown and suburban Johnson County, Kansas and outreach clinics in outlying communities. A not-for-profit hospital, Children's continues its legacy by providing more than \$20 million of charity care each year. The system serves children and families from the surrounding six states as well as across the nation and even overseas.

*Children's Mercy is one of only 13 National Institutes of Health-funded units for pediatric pharmacology research in the US. Its unique research inpatient unit was designed to provide specialty care for pediatric research program participants. Hospital program and services represent 35 pediatric subspecialties handling more than 11,400 inpatients and 225,000 outpatient visits annually. Today, Children's Mercy is involved in a 10-year expansion plan for new inpatient and outpatient facilities at its main and suburban campuses and is realizing its vision of excellence for care delivery and technological achievement.*

Children's Mercy's medical staff includes more than 350 pediatric specialists. Committed to providing service excellence for pediatric care, the system prides itself on both cutting edge technology and world-class research. Its affiliation with the University of Missouri-Kansas City Medical School ensures that commitment to excellence is reflected in the quality of its clinical care.

### New Technology

Research studies have demonstrated that automated compounding offers product cleanliness and delivery accuracy above and beyond that achieved by manual mixing. Children's Mercy was among the early adopters of TPN automation, recognizing that patients receiving multi-source compounded IV solutions would benefit from the system's inherent safety and accuracy.

In 1993, the pharmacy installed a MicroMacro™ 23 Compounder from Baxa Corporation, automating the mixing of up to 23 discrete ingredients in a parenteral solution. The Baxa systems are the only ones that combine the delivery of both macro and micro ingredients in a single,



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integrated compounder. This feature provides an added measure of safety for IV bags which include micro ingredients as well as the base ingredients, an issue of particular importance for neonate and pediatric mixtures as their ingredient volumes are much smaller and the patients are high risk.

Two years later, Children's Mercy added a second compounder, a Baxa MicroMacro 12, to their pharmacy to handle the increasing demands for automated solutions. Workload was balanced between the 12-station and 23-station compounders to optimize productivity. Over time, Mercy pharmacy managers recognized that the nutritional needs of the Intensive Care Unit (ICU) differed significantly from those of the general population. A third compounder was added to the pharmacy in 1999 to allow them to address the clinical differences in the ICU orders.

## Addressing Patient Safety

In December 2001, Baxa introduced a new state-of-the-art automated compounder, the Exacta-Mix™ 2400, for multi-source solution mixing. After seeing a demonstration of the equipment at the American Society for Health-System Pharmacists Mid-Year Meeting, Mahshid Roayaei, PharmD was convinced that Children's Mercy should upgrade. The Exacta-Mix 2400 (EM2400) System's specifications and safety innovations fit well with the vision and objectives of Children's Mercy. Championing the idea to her Director, Mahshid focused on the Windows®-based operating system, air and occlusion detection, and the system's checks and balances. As a result, Children's Mercy was one of the first hospitals to install the EM2400 System in their pharmacy. "I think it's easy to work with," notes Mahshid. "I really like having the pump, the computer and the scale in one unit in the hood."

Mercy chose to install three compounders – two in the main pharmacy and one in the ICU – to replace the three they had in service at the time of the install. The ICU system is dedicated to the NICU pharmacy's demand, however the other two systems handle TPN compounding, dialysate and other large-volume solutions. The flexibility of the EM2400 Systems means the pharmacy can handle stat demands and move back and forth easily from one type of solution to another. There is no need to batch and queue similar formulas. The system software facilitates a secondary pharmacist check which is Mercy's policy for IV admixtures. In addition, the bar code verification feature prevents medication errors and facilitates system setup.

According to Mahshid, "The 'black box' feature is a big advantage. Sometimes a technician will have an issue and can't describe accurately what happened." She continues, "The black box allows me to see exactly what was done on the compounder."



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The blackbox feature functions much like the an FAA blackbox in that it records every action executed on the compounder. The blackbox report, along with other standard reports, provides all the necessary information for a specific compounded solution.

*“Skill cannot take the place of sympathy and understanding; for science without heart is ugly and pitiless” – Dr. Katherine Berry-Richardson, Founder*

### **Conclusion**

Children’s Mercy was initially drawn to the EM2400 System to support their efforts toward medication event prevention. The safety features of the EM2400, including air and occlusion detection, bar coding, and secondary pharmacist check, provided them with the safeguards necessary to compound TPN and other solutions accurately and reliably.

This example, describing the use of TPN automation at Children’s Mercy, demonstrates how technology can support the unique needs and specialty care goals of a leading healthcare provider. For more information about Children’s Mercy Hospitals and Clinics, visit [www.childrens-mercy.org](http://www.childrens-mercy.org). For information on Baxa products for automated compounding, contact Customer Service at 800.567.BAXA (2292) or visit [www.baxa.com](http://www.baxa.com).

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