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Case Studies

Lucile Packard Children's Hospital (LPCH) at Stanford:

*New TPN process minimizes medical
errors, reduces man hours*

Overview

Internationally recognized for pediatric and obstetric care, Lucile Packard Children's Hospital at Stanford provides a wide range of services for babies, children, adolescents and expectant mothers. LPCH pediatricians, specialty doctors, nurses and staff serve children and their families in the San Francisco Bay Area, Silicon Valley, northern California and beyond. It is recognized both for its achievements and its commitment to highly specialized care.

LPCH traces its roots to the Stanford Home for Convalescent Children, which was officially established in 1919. By 1970, the Convalescent Home had moved to larger quarters and changed its name to Children's Hospital at Stanford.

In 1986, David and Lucile Packard of Hewlett Packard donated the funds for construction of a new children's hospital, and in 1988, ground breaking began. The facility was ultimately named in memory of Mrs. Lucile Packard. The hospital officially merged with Stanford Health Services in January 1997.

Today, LPCH employs more than 650 physicians and 4750 staff support and volunteers. LPCH is an academic medical center on the Stanford University campus and many of the doctors also serve as professors at the Stanford University School of Medicine.

Situational Analysis

In early 2003, the hospital began an endeavor to update their Total Parenteral Nutrition (TPN) medical processes. Intravenous nutritional therapy, or TPN, supplies essential nutrients like proteins, carbohydrates, fats, vitamins, minerals and trace elements. Over the past 35 years, TPN therapy applications have broadened. Unfortunately, intravenous nutritional therapy can be an intricate and error-prone process because it requires laborious attention to details. A TPN solution averages 16 ingredients, nine of which can be lethal if given in excessive doses.

Objectives

A number of objectives were established for this TPN program including, first and foremost, the development of a safer, more clinically effective and efficient TPN environment. Additional objectives included: finding

solutions to reduce adverse drug events (ADEs), finding ways to progress towards USP 797 compliance, finding methods to reduce risk of infections and a reduction in compounding time.

A task force that included LPCH pharmacist Steven Chin, PharmD, spearheaded by Robert L. Poole, PharmD, Director of Pharmacy at LPCH; John A. Kerner, MD, Professor of Pediatrics at Stanford University School of Medicine; and Nick Mackenzie, MD, Anesthesiologist, began to look at various alternatives to address these objectives. After careful consideration, in March of 2004 the task force elected to integrate Baxa Corporation's Exacta-Mix 2400 (EM2400) hardware and the TPN Medsoft Software from Monterey Medical Solutions into their TPN process.

A Win-Win-Win Situation

"It was evident from day one that this combination of LPCH, Baxa and Monterey Medical was a win-win-win situation," said Dr. Poole. "For example, we immediately went from three technicians mixing TPN solutions 6.5 hours each per day (20 total hours) under three sterile hoods, to one technician mixing compounds six hours per day under one sterile hood. It freed up two of our people to perform other functions." He added, "We also went from mixing approximately 40 solutions per day by three people to over 67 per day by one."

The combination of LPCH-Baxa-Monterey Medical focuses on each patient's individual needs. This TPN compounding solution accounts for the physiological composition of each patient – including specific nutritional requirements – and will formulate an intravenous solution according to that information.

"In the last 24 months, we have decreased ADEs by over 70%," said Poole. "We have also decreased our rates of TPN related pharmacy interventions, the number of steps in the TPN process, and incident reports."

The Baxa Exacta-Mix™ 2400 Compounder...the only closed system that handles both macro and micro ingredients

Prior to implementing the Baxa system, LPCH relied on a macro compounder for most of its needs. According to Dr. Poole, LPCH upgraded to the Baxa EM2400 system because they were looking for a state-of-the-art automated closed system that could decrease the potential for human error and touch contamination and minimize infection. Since the EM2400 has 24-source-ingredient mixing capability, and can mix a patient bag in 3-to-6 minutes, other benefits have been

realized: reduced variances in care, elimination of waste, reduced costs and improved patient safety.

The EM2400 is a Windows[®]-based system that utilizes graphic user interfaces with touch-screen control. The system is easy to learn and easy to use. Dr. Poole stated that the device was installed on a Monday, training was completed the next day, and the entire system was in full operation by Wednesday.

In addition, the EM2400 is safer than alternative mixing methods for TPN. A bar code reader verifies source ingredients and patient prescriptions. The system incorporates an audit record for quality assurance and accuracy.

Monterey Medical Solutions' TPN Medsoft™ Software... making a potentially dangerous procedure reliable and safe to implement

With medical errors being one of the top 10 leading causes of death in this country, reducing errors is a priority at most hospitals. First used at LPCH, TPN Medsoft software aids in reducing TPN therapy mistakes. By automating the processing of physicians' prescriptions to create easy-to-follow instructions for pharmacists, potentially dangerous procedures become more reliable and safer to implement. The software also notifies the doctor if there are variations between the prescribed amount to be given to the patient and the amount listed in standard nutritional protocols.

The Windows-based software has a user interface that is easy to understand and implement. The people using the software – doctors, nurses and pharmacists – have extensive training in nutritional therapy and were able to learn the new software in a matter of minutes.

Conclusion

Dr. Poole credited the new TPN process with ensuring a much safer treatment plan for infants, as well as adults, who need TPN therapy. He also noted that even though most hospitals know to follow strict guidelines, many do not.

In April of 2005, LPCH was recognized with a national quality and safety award sponsored by the Child Health Corporation of America (CHCA). This award, called "Race for Results," is given to children's hospitals that demonstrate significant and sustained improvements in care. By redesigning medication processes, managing high-alert medications and involving front line staff in medication safety, LPCH championed the process for improved medication practices.



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“It is with tools such as the EM2400 and TPN Medsoft Software that we can make TPN therapy truly safe for the first time. The TPN process we have implemented has made a huge impact on the pharmacy environment and culture at LPCH,” concluded Dr. Poole.

For more information about Lucile Packard Children’s Hospital:

Visit www.lpch.org.

For more information about Baxa products:

Contact Customer Service at 800.567.BAXA (2292) or visit www.baxa.com.

For more information about Monterey Medical Solutions:

Contact 800.651.8836 or visit www.montereymedicalsolutions.com.

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