MANAGING FOR DAILY IMPROVEMENT RESULTS IN IMPROVED PATIENT CARE
See page 11
Pam Rosenthal, RN, and Sharon Hardin, CRT, prepare Ariel Peregrino for her breathing treatment in the Pediatric ICU. The Managing for Daily Improvement initiative has resulted in improvements throughout the hospital. For example, the number of times emergency respiratory therapy equipment is unavailable in ICUs when needed has been reduced from three to zero.
As you know, St. Louis Children’s Hospital (SLCH) sees children and teens with a variety of health issues from all walks of life. We have a responsibility to provide care for all of the children and youth who come to us, regardless of their problems or their attitudes. We need to be careful that we don’t pre-judge patients or their families based upon their appearance, social background or even their behavior. Every one of them has a core of goodness, and the possibility of making some poor choices when faced with temptation. If we look for the strengths in every young person (and every family) and make it safe for them to tell us what is really going on, we will be doing “what is right for kids.”

In this issue you will read about how The SPOT Adolescent Clinic is working to help our young people at risk. The SPOT is a resource for youth in our community who might otherwise have limited access to health care services. This is an example of a program where SLCH and Washington University Medical School are reaching out into our community as partners to help youth at risk. We are also working on developing our services for children and youth with behavioral health needs. This work will complement other services in the community and hopefully will help us all be more confident and effective in our work with youth at risk. Look for more updates on this work in the future.

The other articles in this issue highlight programs aimed at making SLCH a safe and reliable place for care. As we learn more about human factors and errors in health care, we are challenged to continuously improve our systems, and this has become a major hospital focus. Examples of advancing this work include projects such as DRACO (Dose Range Auditing and Checking Overseer) in KiDDOS (electronic medical record), TPN (total parenteral nutrition) process improvement and MDI (managing for daily improvement) boards. Improving patient safety requires the participation and personal ownership of every team member to be successful. I know that each and every one of you is helping us to achieve our safety goals. You all continue to impress me with your dedication to being your best for every patient, every family, every day!

Peggy Gordin, MS, RN, NEA–BC, FAAN, is SLCH’s Vice President of Patient Care Services. She can be reached at pgordin@bjc.org.

Dr. Sarah Garwood provides prevention and education on key issues affecting youth during visits.
The SPOT (Supporting Positive Opportunities with Teens) is a one-stop, drop-in center for youth that is easily accessible to meet a teenager’s health, social support and prevention needs free of charge and with as few administrative barriers as possible. At The SPOT, youth may opt to receive a range of confidential services. The SPOT engages youth in all aspects of program development and fosters active youth leadership. Open five days per week, drop-in and walk-in hours are flexible so that youth can easily access services.

Four years after opening, The SPOT has served 7,172 youth, ages 13 to 24. Services include:

- medical and reproductive health care
- sexually transmitted infection (STI) and human immunodeficiency virus (HIV) screening and treatment
- case management
- mental health (including substance abuse)
- other social and prevention services

The program strives to reach racial and sexual minority youth. To this end, 85 percent served by the program are minority youth, with 78 percent of the adolescents served identified as African American. Lesbian, gay, bisexual and transgender youth make up 16 percent of the populations served. The SPOT has closely monitored the geographic distribution of those served and found that youth throughout the bi-state metropolitan region are seeking services. The majority of those served came from the central corridor, and north and northwest St. Louis County.

The program’s main goal is to support youth where they are today and help them gain the skills to achieve their goals in the future. Center staff are vital in creating a safe place to develop trusting relationships where youth feel comfortable seeking services. In addition to medical and mental health teams,
Those served by The SPOT often face difficult circumstances with a positive attitude. For example, formerly homeless youth pay it forward and make material donations to help others their age.

Case managers provide critical resource/referral services and work to empower youth to problem solve and navigate community systems. Case managers also serve as a critical connection between The SPOT and organizations serving the same population. Comprehensive services include addressing issues such as pregnancy, homelessness, substance use, domestic violence, gang involvement, food insecurity, and other significant life stressors.

A newer program at The SPOT called COACH, Creating Options and Choosing Health, aims to reach youth in foster care in St. Louis City and St. Louis County. As youth enter the foster care system they are routinely referred to The SPOT to receive their mandatory, 30-day comprehensive medical assessment. This check-up provides care for teens that may not have seen a doctor in a long time and also acts as an introduction to ongoing services. The SPOT becomes their medical home, and these youth can return for any services they need until they turn 25, long after they have left foster care. Paired with medical treatment is an evidence-based pregnancy and STI prevention intervention offered to youth who are sexually active. Many teens in the COACH program have never received education about their sexual health. They can ask questions and discuss pregnancy or STIs with an adult.

Those served by The SPOT often face difficult circumstances with a positive attitude. For example, formerly homeless youth pay it forward and make material donations to help others their age. The SPOT supports youth in ways that sometimes fall outside traditional education sessions or medical directives. Staff and youth together have designed and decorated the drop-in space, trained for a 5k run and advocated at state legislator offices. This past May, FOCUS St. Louis, a local civic organization, recognized The SPOT in the What’s Right with the Region! awards celebration as a program demonstrating innovative solutions.

The SPOT is grateful to Washington University and other past and current major funding sources, which include: BJC HealthCare, St. Louis Children's Hospital Foundation, Barnes-Jewish Hospital Foundation, The Missouri Foundation for Health, St. Louis Mental Health Board, St. Louis County Children's Services Fund, and federal grants from the Substance Abuse and Mental Health Services Administration (SAMHSA) and The Office of Adolescent Health (OAH).

To learn more about how to inform potential clients about services offered at The SPOT, please visit: thespot.wustl.edu/index.html or call The SPOT at 314-535-0413.

For additional information, contact Dr. Katie Plax at Plax_K@kids.wustl.edu and Kimberly Donica at Donica@kids.wustl.edu.

The SPOT offers positive youth development and brings together a diverse staff with expertise in health, behavioral health and prevention. From left: Kimberly Donica, LSCW, program director; Salim Phillips; Stefani Weeden-Smith, MPS; Lauren Montgomery, MSW; and Rochelle Moore, MA.
Total parenteral nutrition (TPN) is a solution delivered intravenously that provides a complete and balanced source of nutrients for patients who cannot consume a normal diet. The ordering of this drug is customized for each patient by using a series of complex calculations. When St. Louis Children’s Hospital (SLCH) went live with computerized provider order entry (CPOE), it was decided that TPN orders would remain a paper process until the TPN calculator could be built safely and effectively in KIDDOS (CPOE system). While the TPN process minimally changed with the CPOE implementation, a task force was developed to evaluate the current practice and identify opportunities for process improvement.

Task force members included Clinical Information Systems, physicians, pharmacists, nursing and Risk Management. The group identified three separate stages that together made up the TPN process:
1. provider ordering
2. pharmacy processing
3. nursing administration

The focus of the task force, which met from December 2011 to January 2013, was to improve patient safety by standardizing safe and consistent workflow processes.

The first task was to map each stage of the process into steps and identify areas with inconsistencies or a potential for process breakdown. Completion of this task resulted in the following:

- defined a structured process to assist in ordering, processing and administering TPN
- improved communication among clinicians
- connected the paper TPN order to the electronic health record (EHR)
- created a TPN guideline for each stage in the process

The TPN process: closing the loop

Becky Finke, BSN, RN, CPN, administers total parenteral nutrition for her patient Lannah Ogden, pictured with Brandi Conley, RN.
As a result, an electronic “TPN daily communication order” was built in KiDDOS to communicate the TPN plan to all clinicians. The order was piloted in the Newborn ICU and was well received by all clinicians involved as evidenced by a post-pilot online survey. The positive feedback led to successful process implementation in remaining inpatient units. Providers now enter this order daily, which communicates any planned TPN changes to pharmacy, nursing staff and other providers. As a result, the number of phone calls the pharmacy is required to make to providers has been drastically reduced, and all clinicians involved have a clear knowledge of the TPN plan for each patient. The electronic “TPN daily communication order” has closed the communication loop between providers, pharmacy and nursing. This order has connected the paper TPN order to the EHR through electronic communication.

The final goal was to create a TPN administration guideline for each step in the process. The guideline includes a general page explaining the purpose and benefits of the document before breaking out into each individual stage. The steps within each stage used to identify potential for breakdown were outlined in an easy-to-follow process flow diagram. This document can be accessed by staff from the policy and procedure webpage Compliance 360.

The TPN task force was successful in defining and streamlining the TPN process, closing the loop to prevent communication breakdowns among providers and developing a step-by-step guideline to ensure staff have consistent processes to follow. This process improvement, along with ongoing education, should improve patient safety and set the stage for implementing the TPN calculator in KiDDOS.

For additional information, contact Krystie Hengehold, BSN, RN, CPN, at kmh7813@bjc.org.

**TPN Update**

The TPN task force identified issues that can arise as a direct result of complete TPN orders not being integrated into the electronic medical record. The staff burden and risk of unnecessary error potential in this process has prioritized the build of the TPN calculator into the KiDDOS system. The calculator is scheduled to be implemented later this year.
Nationally, medication dosing errors occur in up to 17.8 percent of hospitalized children. Children are particularly at risk for medication errors because drug dosages are individualized and calculated based on body weight. To prevent such a high percentage from occurring at St. Louis Children’s Hospital (SLCH), a team including pharmacists, clinical information systems professionals and physicians examined historical medication ordering data and assessed shortcomings of the hospital’s dose-range checking system.

The team found several limitations that prevented system alerts from being sensitive and specific enough for SLCH’s pediatric patients. There were also no alerts (hard stops) preventing a user from ordering a dangerously high dose. This created potential for over- and under-alerting prescribers.

The team sought to make the dose alerts more sensitive, explicit and more customized to each specific situation. Customized software was written to allow clinical pharmacists the ability to review historical dosing data and specify new alerts. This new software, named DRACO (Dose Range Auditing and Checking Overseer), allows dose-alert adjustment without requiring programmer intervention.

Dr. Kevin O’Bryan served on the Dose Range Auditing and Checking Overseer (DRACO) task force, a system now in place to provide safe patient care.

The team that developed the system DRACO system earned the 2012 Barbara Cole Quality Award.

An example of a dose range hierarchy for Enoxaparin Injectable in the Newborn ICU. Multiple data points decide the appropriate dose for the baby.
DRACO features robust capabilities that include:

- assignment of various dosing alerts for medications
- modification of the dose-rule hierarchy (see Figure 1)
- review of historical data to design new dose rules, without requiring a database expert
- creation of individualized alert messages with custom font formatting
- creation of medication shortage messages
- monitoring of and reporting of the effectiveness of dose alert rules

The new DRACO dose range checking system went live in the KiDDOS clinical information system in October 2012 with the initial pilot of medications and dose range checking rules. Users began receiving the customized hard stops and soft stops, rather than the previous generic warning messages. To evaluate how users were responding to the new alerts, a real-time dashboard was designed to provide feedback (see Figure 2). Users were placing helpful comments when overriding the alerts. These comments were available to the pharmacists when filling an order, thereby closing the communication loop between the inpatient pharmacy and prescribers without requiring a delay in care. After realizing the potential of the dashboard for dose range alerts, it was configured to review all other alerts generated inside KiDDOS. With this tool in hand, the Clinical Decision Support Committee can make new strides toward more effective pediatric alerts to ensure safe patient care.

For additional information, contact Charles Andrus at cha2895@bjc.org and Patrick Feldman at paf9372@bjc.org.

Customized software was written to allow clinical pharmacists the ability to review historical dosing data and specify new alerts. This new software, named DRACO (Dose Range Auditing and Checking Overseer), allows dose-alert adjustment without requiring programmer intervention.
Children with heart defects are living longer, thanks to medical advances. Their medical condition makes them “different” from other children, which can threaten their quality of life. As a result, these patients often need help in coping with their condition and maintaining healthy self-esteem.

Nurses, social workers, child life specialists and physicians all work together to provide an overnight camping experience for over 100 children with cardiac disease. Camp Rhythm was started in 2005 after a heart patient was turned away from a traditional camp due to his extensive cardiac history.

Camp Rhythm is unique because pediatric nurses and cardiologists are available onsite to campers during the entire camp experience. Camp founders sought to create an environment where campers would learn they are not alone in living with heart disease. Camp founders sought to create an environment where it is normal to be sick, have scars and take medication. It was hoped the children would feel accepted and make lifelong friends while building self-confidence. The camp appeared to be successful, with campers excited to return each year. To further evaluate the program, a study was designed to assess the outcomes of the camp experience for both the camper and the parent in order to assess the effectiveness of the camp in relation to its mission and purpose. The study was made possible by a multi-institutional grant from the St. Louis Children’s Hospital Foundation.

Parents and children were recruited for the study in summer 2012 at Camp Rhythm, and 49 pairs elected to participate. After check-in, parents and children completed several questionnaires to measure child anxiety, parent anxiety and the child’s attitude toward illness. Children were given a camera and asked to take pictures of what “is special about being at camp.” After several days, the cameras were collected so the pictures could be developed and returned to campers. The research team delivered the pictures to study participants and asked them to tell a story about their favorite picture. These interviews were recorded and later analyzed by the researchers to discover what common themes the children identified. Both parents and children were resurveyed at the end of the camp. The results suggest children with heart disease experience high levels of psychological distress such as anxiety. The questionnaires completed at the end of camp demonstrated a decrease in anxiety scores for both first-time and returning campers.

The scores for the child’s attitude toward illness did not significantly change in this study, although their scores indicated they had much better feelings about their cardiac condition overall compared to studies of other chronically ill children. The researchers suggest the study participants may have a greater degree of adjustment to their illness since they have lived with it all of their life as opposed to campers with diabetes, burns, or even asthma.

The questionnaire completed by parents helped evaluate the feelings of separation and parental beliefs in the child’s ability to adapt and benefit from non-maternal care. Although there were no measurable changes for parents of returning campers, the
results for parents of first-time campers were significantly different. This demonstrates an important benefit in reduction of parental separation anxiety among parents of children who have not experienced an overnight camp.

Findings from this portion of the study demonstrated a decrease in parent anxiety after the child’s camping experience, especially for first-time campers. This suggests a camping experience for these children may be beneficial psychosocially for parents and could reduce some caregiver burden. Second, the study findings can be used by providers to support parents contemplating a camping experience for their child with heart disease. Health care providers can cite the reduction in camper anxiety, positive camper feedback related to psychosocial factors, and decreases in trait anxiety as evidence to support camping initiatives for children with heart disease. Additionally, decreases in anxiety following camp suggest a long-term benefit for these patients.

For additional information, contact Charlotte Smock at charlols@bjc.org.

Learn more about Camp Rhythm at http://www.stlouischildrens.org/our-services/heart-center/camp-rhythm

Radiology staff members discuss progress of various metrics on the department’s MDI board. A completed metric for the department was the reduction in the number of times ultrasound and GI patients did not appear on the radiology schedule from nine per month to less than two per month. From left, Kim Hoffmann, RT(R), staff technologist; Nicole Booker RT(R), staff technologist; Ashton Schultz RT(R), staff technologist; and Anne Hertling RT(R), charge technologist.

---

**TRANSFORMATIONAL LEADERSHIP**

**Managing for Daily Improvement (MDI)**

**Staff use disciplined approach to improvement**

In 2012, St. Louis Children’s Hospital (SLCH) initiated a hospital-wide quality improvement initiative known as managing for daily improvement (MDI). MDI is a daily measurement/problem-solving mechanism driven by frontline staff. The objective of MDI is to give staff at all levels of the organization the ability to eliminate problems preventing them from providing safe care, effective care and exceptional service. Through MDI, staff advocate for resources needed for patients and families. MDI has three primary objectives: empowerment, collaboration and communication. Frontline staff identify opportunities to improve their work environment and patient care. They are encouraged to look for the problematic “pebble in their shoe” and are given the tools, techniques and authority to make positive changes. Department teams collaborate to create and maintain metrics on an MDI board. All staff participate by collecting data throughout their shifts.

-- continued on next page
Related to the metrics. Each board is reviewed and updated daily with metrics focused on quality, safety, service delivery and/or cost.

The measures are presented to senior staff and leaders conducting “gemba walks” to view MDI boards across the hospital. Gemba is a Japanese term meaning “where the work is done.”

Improvement efforts are categorized into five common areas: clinical provider, ancillary provider, information, equipment and supplies.

### Current Metric Summary

<table>
<thead>
<tr>
<th>Common Issue Category</th>
<th>*Frequency of Metrics</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical Provider Related</td>
<td>24</td>
<td>100% of patients on MRI table on time. All scheduled hematology/oncology patients will have orders available prior to arrival in Outpatient lab</td>
</tr>
<tr>
<td>Ancillary Service Related</td>
<td>19</td>
<td>All asthma patients transferred from Emergency Unit (EU) will have next respiratory treatment within 140 minutes of last EU treatment</td>
</tr>
<tr>
<td>Information Related</td>
<td>18</td>
<td>MRI screening form is filled out correctly</td>
</tr>
<tr>
<td>Equipment Related</td>
<td>4</td>
<td>To have no more than one non-invasive blood pressure machine unavailable when needed in Oncology clinic</td>
</tr>
<tr>
<td>Supply Related</td>
<td>8</td>
<td>100% of OR trays prepared by CPD will be correct</td>
</tr>
</tbody>
</table>

### Completed Metrics

<table>
<thead>
<tr>
<th>Common Issue Category</th>
<th>*Frequency of Metrics</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical Provider Related</td>
<td>13</td>
<td>Reduced number of interruptions when mixing meds from 5 per day to &lt; 1 per day; Improved number of times RN included in 6 morning rounds from 0% to 90%</td>
</tr>
<tr>
<td>Ancillary Service Related</td>
<td>10</td>
<td>Reduced # of missing log-ins in Central Receiving from 4 per day to &lt;2 per day; Reduced number of delays caused by Interventional Radiology room not being cleaned from 2 per day to 0 per day</td>
</tr>
<tr>
<td>Information Related</td>
<td>15</td>
<td>Reduced # of times Ultrasound and GI patients not on radiology schedule from 9 per month to &lt;2 per month</td>
</tr>
<tr>
<td>Equipment Related</td>
<td>11</td>
<td>Reduced # of times emergency respiratory therapy equipment unavailable in ICUs when needed from 3 per day to zero</td>
</tr>
<tr>
<td>Supply Related</td>
<td>5</td>
<td>Reduced linen stock-outs in MRI from 3 per day to 0 per day</td>
</tr>
</tbody>
</table>

*Number of times the category is cited on MDI boards throughout the hospital.

For additional information, contact Mary Pat Darnell at mpd7751@bjc.org.