On the Front Lines: Lessons Learned in Implementing Multidisciplinary Peripheral Venous Access Pain-Management Programs in Pediatric Hospitals

Sarah Leahy, BA, RN, RSCN; Robert M. Kennedy, MD; Joy Hesselgrave, MSN, RN, CPON; Karen Gurwitch, PharmD; Mary Barkey, MA, CCLS; Toni F. Millar, MS, CCLS

ABSTRACT

Venipuncture and intravenous cannulation are among the most common and widespread medical procedures performed on children today. Therefore, effective treatment of venous access pain can benefit from an integrated systems approach that enlists multiple players in the health care system. By using case studies that analyze this issue from the perspective of the nurse, the physician, the pharmacist, and the child life specialist, this article illustrates how multidisciplinary programs designed to manage needle pain have been developed successfully in several institutions. Common themes that arise from these case studies include the importance of a multidisciplinary, evidence-based approach to advocate change; a system-wide protocol for the administration of local anesthetics; convenient access to topical local anesthetics; department and hospital-wide support for educational efforts, including training in nonpharmacologic techniques used by child life specialists; and ongoing quantification of the overall success of any program. Implementation of these strategies can result in significant improvements in the pediatric venous access experience.

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ATTITUDES ON PREVENTING procedural pain in children are changing as medical centers seek to comply with recent policy statements and clinical guidelines. The American Academy of Pediatrics and the American Pain Society recommend that efforts to soothe and minimize pediatric distress be considered even for minor procedures such as venipunctures. A recent publication by the International Association for the Study of Pain cited humanitarian, ethical, and practical reasons for managing and preventing pediatric pain. It is important to note that the management and prevention of pain in children is not limited to highly painful conditions and procedures but also includes the prevention of pain associated with venous access procedures whenever possible.

In this article we review the experiences of 5 children’s hospitals in the United States that have well-developed peripheral venous access pain-management programs. The case studies, written by roundtable members integrally involved in the development of these programs, summarize the strategies that were used successfully in implementing systematic and multidisciplinary programs for the management of venous access pain in the individual hospitals.

When the case studies are viewed in totality, a number of common strategies are found to be essential in moving the pediatric venous access pain-management programs from theory to practice: (1) assembling a multidisciplinary team to advocate change; (2) using an evidence-based approach to determine which interventions would best suit a particular institution; (3) using a system-wide protocol for the administration of local anesthetics in the hospital setting; (4) storing local anesthetics in patient care areas and using physician standing orders to facilitate access to these agents; (5) securing department and hospital-wide support of the programs through educational efforts; (6) introducing nonpharmacologic techniques often used by child life specialists as an adjunct to pharmacologic pain management; and (7) quantifying the overall success of the program by using key metrics both before and after program initiation.
CASE STUDY: IMPROVING OUTCOMES IN PERIPHERAL VENOUS ACCESS PAIN AMONG PEDIATRIC PATIENTS AT CHILDREN’S HEALTHCARE OF ATLANTA

Sarah Leahy, BA, RN, RSCN, is the coordinator of Making Needles Hurt Less, a program designed to improve the management of pain associated with peripheral venous access procedures at Children’s Healthcare of Atlanta (Children’s), a 3-hospital pediatric health care system in Atlanta, Georgia. The program grew out of recognition that control of venous access pain would improve the hospital experience for children, their parents, and the hospital staff. The program, which includes education of the health care community on the importance of controlling venous access pain, has led to significantly improved patient and family satisfaction rates and more frequent use of local anesthetics and behavioral pain-management techniques.

Leahy attributes the success of Making Needles Hurt Less to its multidisciplinary approach, which involves mobilizing the broad-based support of numerous departments in the health care system as well as hospital administration.

In 2000, a multidisciplinary task force was established at Children’s to improve pain management in our patients. Venous access—related pain and distress were prioritized by our team as an area of focus because of the potential benefit to so many patients (in 2001, ~82,000 venipunctures were performed at Children’s for laboratory tests alone). A venous access pain initiative was already in place in the emergency departments (EDs) of our hospitals, and elements of that initiative served as a model for the larger institution-wide effort. The program that emerged, “Making Needles Hurt Less,” was designed to facilitate permanent changes in the management of venous access pain across multiple disciplines and departments at Children’s. Making Needles Hurt Less is one of the first and longest-running pediatric hospital venous access pain-management programs in the United States.

Mobilizing Support
A critical factor in the success of Making Needles Hurt Less was the formation of a strong multidisciplinary team of clinical staff and senior leadership. The task force was composed of 30 people representing all relevant disciplines and departments, including nursing, medical staff, pharmacy, child life, quality and safety, and phlebotomy. Because there are 3 hospitals in our health care center, we felt that broad representation would be necessary for the program to gain wide acceptance throughout the institution. Together, the team agreed on principles of care for venous access pain-management procedures (Table 1). These principles, which were adopted in 2002, became the foundation for multiple process and practice changes.

Expanded Roles and Heightened Awareness
Another important element of the program was education, which was directed at all clinical staff members, patients, and their families. We reviewed and compiled the pain literature advocating venous access pain management and disseminated that information via in-services throughout the hospitals. Our initiative also focused on actions to increase the visibility of the venous access pain initiative and improve the availability of tools for venous access pain management, such as topical anesthetics and sucrose (24%) for infants. We also strove to incorporate cognitive-behavioral approaches into the overall management of venous access procedures.

The use of topical anesthetics and sucrose was facilitated by the development of preprinted physician order forms (at the end of 2002) and, subsequently, standing orders (at the end of 2003). At the beginning of 2003, storage of these items was relocated so that staff could quickly obtain the medication they needed. For example, sucrose was moved from medication-dispensing machines to more-accessible supply carts. Moreover, liposomal lidocaine 4% (LMX4 topical anesthetic cream [Ferndale Laboratories, Inc, Ferndale, MI]; previously known as ELA-Max), an over-the-counter medication, was placed in hospital gift shops so that parents could purchase the topical anesthetic cream before a hospital visit. In addition, educational materials that specifically address venous access pain were created for parents and the staff. Caregiver roles were revised so that use of medications and behavioral techniques was expanded to include a wider range of hospital personnel, including phlebotomists.

Phlebotomy Department
A significant innovation of the Children’s program was the inclusion of the phlebotomy laboratories at the institution (11,410 patients at Children’s at Egleston and 15,304 patients at Children’s at Scottish Rite received blood draws in 2006 in our outpatient laboratories). When the venous access pain initiative was first implemented, parents whose children had received effective pain management as inpatients came to our outpatient laboratories, where venous access pain measures were not yet in place. The parents expressed their disappointment, and as a result, our outpatient laboratory procedures were revised in August 2005 to include venous access pain management. State regulations and Children’s policies were reviewed to clarify the scope of phlebotomy practice, and an education and training program was created. Education included reviewing the impact of venous access pain and the use of sucrose, vapocoolant spray, liposomal lidocaine 4%, and cognitive-behavioral techniques. The phlebotomy department

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<tr>
<th>TABLE 1</th>
<th>Principles of Care for Procedures Involving Venous Access at Children’s</th>
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<tbody>
<tr>
<td>Avoid or cluster venous access procedures whenever possible</td>
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<tr>
<td>Use the intramuscular route of administration only if absolutely necessary</td>
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</tr>
<tr>
<td>Intervene early; if a child has a difficult experience with his or her initial venipuncture/IV start, then heightened anxiety will surround subsequent procedures</td>
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<tr>
<td>Be safe; the barrier function of the skin is relatively immature in infants and young children, who also have a higher ratio of skin surface area to body weight, anesthetic creams and other topical preparations should be used judiciously</td>
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<tr>
<td>Be developmentally appropriate</td>
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<tr>
<td>Combine the use of behavioral and pharmacologic interventions</td>
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<td>Use good techniques and the latest equipment</td>
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Use good techniques and the latest equipment
is now an important part of our venous access pain initiative. Members of the phlebotomy staff are some of our most proactive champions and patient advocates.

On inpatient units, phlebotomists can administer sucrose to infants, liposomal lidocaine 4%, and vapocoolant spray. Currently, the laboratory and inpatient nursing departments are collecting data to evaluate the placement of local anesthetic cream by nursing staff before morning blood draws by phlebotomists.

In outpatient laboratories at our center, receptionists inform parents on arrival about topical anesthetic use. Colorful posters in the waiting rooms reinforce this service and its benefits to children. Distraction materials for children of all ages are readily available in each room, along with educational materials for parents with suggestions on how to help children cope with venous access procedures.

Changes Over Time and Current Challenges
As changes were instituted at our center, steps were taken to measure progress. In a collaborative effort between the pharmacy and quality departments, use of topical anesthetics and sucrose was measured as a rate relative to the hospital census. Data were collected on use of specific products and on the products as a group, from department to department and system-wide (ie, from hospital to hospital). Monthly dissemination of data to all departments, along with quarterly reporting to senior leaders, helped to maintain interest and momentum.

Use of topical anesthetics and sucrose actually increased before the program formally began and then continued to rise (Fig 1); it is likely that increased discussion and consciousness-raising during the planning period prompted this rise.

A question specific to venous access pain management was included on hospital customer satisfaction surveys to assess performance improvement and maintain visibility of the issue for the staff. Parents were asked to rate efforts to reduce their child’s fear/distress related to venous access procedures. In some areas, implementation of venous access pain management coincided with significant increases in overall customer satisfaction scores. For example, the outpatient laboratories had a rating of 84.3% in early 2005. By 2007, the customer satisfaction score in this area had increased to 90.7%, which our hospital viewed as meaningful.

An institutional approach to the management of venous access pain has evolved over time at Children’s. In 2000, limited education and knowledge and the sporadic availability of interventions curtailed the level of care that could be provided. Today, logistic and administrative barriers have been removed. If a clinician wants to provide venous access pain management, or if a parent requests it, the service can be provided.

Lessons Learned
On the basis of the experience at Children’s, cost and operational issues should be anticipated when implementing a venous access pain-management program. Costs associated with such programs must be continuously monitored to ensure that they are commensurate with the benefits derived from the program. At the onset of our program, the lack of convenient access to medication caused by resistance to standing orders proved to be a significant operational obstacle. When it became apparent that there was opposition to standing orders, preprinted medication order forms, which still required physician approval, were used as an interim measure. After 6 months, physicians became more comfortable with this process and agreed to the creation of standing orders for topical anesthetics, which ultimately allowed for greater access to these medications by nurses. It is important to develop quantitative outcomes for monitoring such a program so that its success can be documented and hospital units that lag behind in their adoption of the program can be identified. Staff members in these units can then be asked for their opinions as to
why the program is not being accepted, and appropriate education can be implemented to improve adherence.

CASE STUDY: THE VENOUS ACCESS EXPERIENCE IN AN OUCHLESS ED AT ST LOUIS CHILDREN’S HOSPITAL
Robert M. Kennedy, MD, is a pediatric emergency medicine specialist at St Louis Children’s Hospital (SLCH) in St Louis, Missouri. Each year, there are ~55 000 pediatric visits to the SLCH ED. Over the past 2 decades, Dr Kennedy and other members of the hospital’s ED have developed sedation and analgesia protocols for pediatric emergency procedures, evaluating their safety and efficacy in randomized clinical trials before implementation. Because so many children exhibited an overwhelming fear of needles, department staff turned its attention to venous access pain out of concern that untreated pain sets a negative tone for present and future interactions among health care providers, patients, and their families. The ED implemented protocols for managing pain from peripheral venous cannulations and venipuncture with local anesthetics and behavioral techniques. The success that was ultimately achieved was based on a number of factors, including conducting clinical trials to evaluate the efficacy of the intervention, effective collaboration between the physicians and nursing staff, support from the hospital administration, and consistent and comprehensive education.

It became evident that many of the procedures performed in the busy ED at SLCH were causing children undue pain and anxiety and that more could be done to improve the entire patient experience. In 1999, we published a review of psychological and pharmacologic interventions that could be implemented in an effort to create an “ouchless” ED. Efforts to minimize pain from peripheral venous access procedures became a key objective in this larger pediatric pain-control initiative. Department staff felt that by reducing the pain associated with such procedures, a positive tone would be set for future health care experiences of patients and families.

Developing Strategies for Pain Management
Efforts to minimize pain in the ED were initially focused on developing anesthetic and sedative combinations to be used during such painful procedures as fracture reductions and suturing of lacerations. The primary strategy has been to evaluate novel pain interventions in clinical trials. In 1 early effort, the ED collaborated with the anesthesiology department to develop a protocol for the use of fentanyl and midazolam during fracture reduction and burn debridement. Subsequently, a study conducted in the ED revealed that the combination of ketamine plus midazolam was more effective in alleviating pain and anxiety during orthopedic procedures than the combination of fentanyl plus midazolam; the results of the study led to a change in practice within the ED. In a recent study, staff members of the SLCH ED demonstrated the benefits of using a nitrous oxide/epidural block for forearm fracture reduction in children.

In addition to the use of clinical trials, another strategy aimed at improving pain management has been the reduction or elimination of barriers to analgesic administration. This was accomplished by implementing standing orders, the first of which enabled triage nurses in the ED to administer oxycodone for suspected fractures and small burns without seeking physician approval.

Pain Management in Venous Access Procedures
In the mid-1990s, the ED turned its attention to venous access, a commonly performed procedure that was associated with significant pain among children. Although lidocaine and prilocaine cream, 2.5%/2.5% (EMLA cream [eutectic mixture of local anesthetics] [AstraZeneca LP, Wilmington, DE]), was available, its 60-minute onset time made its use impractical for many patients in an emergency setting.

Once again, new interventions were first evaluated in clinical trials. In 1 such trial, the efficacy of buffered lidocaine injected with a 30-gauge needle was demonstrated to significantly reduce the pain and anxiety associated with peripheral intravenous (IV) catheter placement. However, despite the effectiveness of this technique, it was rarely used by ED nurses. An investigation revealed that although nurses agreed that IV starts were painful, they had not been taught how to use local anesthetics and, perhaps more importantly, did not recognize the importance of their use.

To rectify these issues, department leadership took the unusual step of instituting IV practicums, in which nurses and others were asked to perform IV starts on each other with and without local anesthesia. Among the interventions tested were buffered lidocaine injections, iontophoresis, and lidocaine and prilocaine cream. Experiencing the procedures for themselves convinced department staff that venous access caused significant discomfort and that local anesthesia, particularly buffered lidocaine, was an effective method for reducing the associated pain. Table 2 summarizes the history of the program for managing pain associated with venous access procedures performed at SLCH.

Eliminating Road Blocks and Expanding the Program
To further encourage the use of local anesthetics before venous access procedures, standing orders were created so that nurses did not need to obtain physician approval to use buffered lidocaine or liposomal lidocaine 4%. In addition, the pharmacy department was asked to compound buffered lidocaine in advance for use in the ED. The use of local anesthetics for venous access procedures has increased dramatically since these steps were taken.

The management of venous access pain has not been confined solely to pharmacologic interventions. In 2005, members of our ED staff conducted a study demonstrating that children experience less distress when sitting in their parents’ laps during peripheral IV start procedures, rather than being restrained while lying on a stretcher. Since then, positions of comfort are routinely used for many procedures performed in the ED, including suturing. Several years ago, child life specialists joined the ED team, and they have played a vital role in instructing nurses and other staff members on the use of distraction techniques for minimizing distress during venous access procedures. Recently, a family-presence policy in the ED
was formalized. The policy has been endorsed enthusiastically by many of the department’s physicians, who have witnessed how much less distress a child experiences when a parent is at his or her bedside. Physicians at other children’s hospitals seem to share these views: a survey of 10 pediatric EDs revealed that >90% of the respondents believed that parents should be present during a peripheral IV start.8

The ED staff at our hospital observed that children <2 years of age were less likely to receive a local anesthetic; feedback from nurses in the department indicated that underuse in this age group was based on the belief that a local anesthetic makes the procedure more difficult. A review of the literature showed that subcutaneous lidocaine infiltration does not affect the success of IV access in this age group.9 An educational program demonstrating the advantages of local anesthesia for venous access procedures was established to allay some of these concerns. The program emphasizes that pain intervention might facilitate, rather than complicate, venous access procedures.

To encourage compliance, staff use of local anesthetics is tracked, and appropriate feedback is provided.

The SLCH ED pain-management program is evaluated regularly as new interventions are developed. Its success thus far can be attributed to a number of factors. Among the most important is instilling a philosophy that pain in the ED is something that can and should be avoided whenever possible. Other key elements include evaluating clinically an intervention and the willingness to demonstrate the efficacy of interventions directly to the staff. Finally, a collaborative approach involving the support of all ED staff, standing orders to simplify the use of and access to pain medications, and nonpharmacologic child life techniques to serve as adjuncts to drug interventions have all been essential to the growth and expansion of the program.

TABLE 2  Evolution of a Pain-Management Program in Patients Undergoing IV Procedures in the ED at SLCH

<table>
<thead>
<tr>
<th>Year</th>
<th>Action(s)</th>
<th>Result(s)</th>
<th>Impact on ED Practice</th>
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<tbody>
<tr>
<td>1996</td>
<td>Trial of injected buffered lidocaine</td>
<td>NA</td>
<td>Use of buffered lidocaine encouraged in ED; nevertheless, it is rarely used</td>
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<tr>
<td>1997–1998</td>
<td>&quot;Ouchless IV&quot; designated a hospital ED QI project: nurses were surveyed regarding IV insertion; IV insertion practicums for nurses were initiated; and IV insertion practicums for third-year medical students were initiated</td>
<td>Nurses used local anesthetics for IV insertion more often after educational intervention</td>
<td>Nurse distress was much less when using an anesthetic for IV insertion17</td>
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<tr>
<td>1999</td>
<td>Clinical study: medical students and interns tested the efficacy of injected buffered lidocaine vs benzyl alcohol by using these agents on themselves during practice IV starts</td>
<td>Subjects reported less pain with buffered lidocaine; mean scores for pain from 30-gauge needle-stick/buffered lidocaine + IV insertion were much lower than scores for pain from IV insertion with no anesthetic (2 sticks are better than 1)</td>
<td>Experience of participating in the comparative trial encouraged the future use of local anesthesia for peripheral IV catheter placements in patients</td>
</tr>
<tr>
<td>2002</td>
<td>Clinical study: assessed the efficacy of injected buffered lidocaine vs liposomal lidocaine 4% for IV insertions in children</td>
<td>Pain reduction and nurse satisfaction were similar with the 2 agents14</td>
<td>Fewer than half of all IV insertions were subsequently started with the use of a local anesthetic</td>
</tr>
<tr>
<td>2003</td>
<td>Standing orders for injected buffered lidocaine or liposomal lidocaine 4% were implemented</td>
<td>Nurses like having a choice of a local anesthetic and the ability to initiate its use</td>
<td>Nurses’ use of buffered lidocaine and liposomal lidocaine 4% for IV starts increased considerably</td>
</tr>
<tr>
<td>2005</td>
<td>Clinical study: assessed position of comfort (parent’s lap) vs stretcher during IV insertion in young children</td>
<td>Finding a physician to secure an order had been a major impediment</td>
<td>The fact that nurses no longer needed to buffer lidocaine was seen as a major improvement</td>
</tr>
<tr>
<td>2007</td>
<td>Clinical study: assessed injected buffered lidocaine vs liposomal lidocaine 4% for IV insertions in nurse practicums</td>
<td>Children on their parent’s lap were less distressed than those on a stretcher; IV success rates were similar7</td>
<td>Use of positions of comfort is recommended during IV starts</td>
</tr>
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</table>

NA indicates not applicable; QI, quality improvement.

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Evaluation
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CASE STUDY: DEVELOPING PERIPHERAL VENOUS ACCESS PAIN-MANAGEMENT PROTOCOLS AT TEXAS CHILDREN’S HOSPITAL—GAINING CONSENSUS AND HOSPITAL-WIDE IMPLEMENTATION

Joy Hesselgrave, MSN, RN, CPON, a pediatric oncology clinical specialist, and Karen Gurwitch, PharmD, director of pharmacy, both at Texas Children’s Hospital (TCH) in Houston, Texas, were responsible for helping to drive a hospital-wide
Peripheral venous access pain-management improvement strategy at their institution. TCH is one of the largest pediatric hospitals in the United States, with 458 beds and ~1600 physicians and 6000 nursing and support staff. The impetus to develop a hospital-wide program to manage venous access pain came from reports from parents who found the distress experienced by their children during multiple IV cannulation attempts to be unacceptable. Critical factors for developing and successfully implementing the program included (1) preparing a protocol that detailed practice recommendations and treatment algorithms using an evidenced-based approach, (2) using nonpharmacologic interventions as adjuncts to drug intervention, and (3) monitoring progress of protocol implementation in a small number of hospital units. In addition, having a pharmacy department committed to improving venous access pain management was essential to the success of the initiative. Pharmacy implemented a program to streamline access to medications, thereby eliminating wait times and resulting in a dramatic increase in the use of preventive measures for venous access pain at the hospital. It should be emphasized that the hospital-wide implementation of the protocol was accomplished over a period of 1 year.

Nursing leadership at TCH recognized that pain from venous access procedures was a significant problem at their institution and that improvements in the management of such pain were sorely needed. Local anesthetics for these procedures were available, but their use was inconsistent. Only infants in the neonatal intensive care and cardiology units were receiving sucrose before painful procedures. Managing pain from venous access procedures became part of an overall TCH goal of minimizing procedural pain in all patients, in all departments, at all times. Key to the foundation of this hospital policy was the strong support of the chief nursing officer. This support served as a powerful motivating force and was a major contributor to the rapid uptake of this program within a 1-year time frame.

**A Multidisciplinary Approach**

A first step toward improving the management of pain associated with venous access procedures was the formation of a collaborative leadership group that comprised members of the clinical nursing practice council along with child life specialists, pharmacists, physicians, and a nurse from the TCH Center for Research and Evidence-Based Practice. Parental participation was also sought through the hospital’s parent advisory board. The initial focus was on improving pain management in peripheral venous access procedures, intramuscular injections, and subcutaneous port access.

**Protocol Development Using Evidence-Based Data**

To facilitate improved use of venous access pain-management strategies, an evidence-based approach for assessing the efficacy of local anesthetics and nonpharmacologic interventions was used. The collaborative group reviewed the clinical literature on various pharmacologic agents dating back 15 years. The data were synthesized into practice tables with recommendations based on the FAME (feasibility, appropriateness, meaningfulness, and effectiveness) method. Data from 3 published randomized, controlled clinical trials demonstrated that a 30-minute application of liposomal lidocaine 4% was as effective as a 60-minute application of lidocaine and prilocaine cream in preventing IV insertion pain. These findings led to a recommendation that liposomal lidocaine 4% be made the topical anesthetic of choice in our hospital because it was highly efficacious, provided faster onset of anesthesia, and was less expensive than lidocaine and prilocaine cream.

Similar investigations led to a total of 4 recommended medications for venous access procedures: (1) sucrose for infants <6 months of age; (2) liposomal lidocaine 4%; (3) buffered lidocaine injected with a small-gauge needle; and (4) lidocaine iontophoresis. The medical literature regarding nonpharmacologic interventions, such as positioning and distraction, was evaluated as well. Studies have suggested that these interventions, alone or in combination, can be effective when used during venous access procedures.

These evidence-based reviews led to the development of a treatment protocol to guide clinical staff on the use of pharmacologic interventions before venous access procedures (Fig 2). The protocol contains several pharmacologic options based on age, urgency of the procedure, and staff and patient preference and provides flexibility for the staff. The protocol also emphasizes that nonpharmacologic methods should be used universally.
Implementing the Protocol
Protocol implementation was monitored at periodic intervals in 5 hospital units (at initiation and at 3 and 6 months). The units chosen (neonatal intensive care, pediatric intensive care, hematology/oncology, general medicine/transplant, and surgery) were those most representative of the larger TCH population. Three measures were used to monitor protocol implementation: (1) a nursing survey on the use of protocol medications for venous access procedures, intramuscular injections, and subcutaneous port access; (2) use of protocol medications dispensed by the pharmacy; and (3) family interviews to assess parental satisfaction. To improve protocol compliance, sucrose and local anesthetics were made available on individual units, which reduces time to obtain and subsequently deliver medication orders from the pharmacy. In the past, time delays had proved to be a barrier to the use of medications before venous access procedures.

Staff Compliance Challenges
Periodic telephone surveys were conducted with parents to obtain parental satisfaction scores, which compared favorably to those of previous periods. Staff adherence to the protocol was assessed through nursing self-reports and the monitoring of medication use by pharmacy. Fifteen months after its implementation, the procedural pain protocol was being used by nurses in 83% of venous access procedures, which represents a dramatic increase from earlier years, when use of local anesthetics ranged from 10% to 15%.

Lack of compliance emerged as a key challenge. If unaddressed, this issue might have derailed the program. Therefore, a hospital-wide educational and internal communication initiative was launched, which included staff testimonials, enlisting the support of highly respected and influential physicians, nurse training on the injection of buffered lidocaine, train-the-trainer programs, and live and online demonstrations.

Making the Protocol Work: The Pharmacy Perspective
The pharmacy department and the Pharmacy and Therapeutics Committee both played important roles in the development and implementation of the protocol for venous access pain management. Specifically, the Pharmacy and Therapeutics Committee reviewed the evidence supporting the use of pharmacologic agents considered for inclusion in the protocol and approved the recommendations. The pharmacy department ensured compliance with accreditation and regulatory standards and collaborated with nursing staff to ensure that the ordering and dispensing of medications were conducted efficiently.

It was understood that expedited access to appropriate medications was critical to the success of the protocol. Simplifying the ordering and administration of local anesthetics required a change in the hospital’s medication-ordering policies. Three elements were crucial to the program’s success: (1) all patients at TCH are placed on the protocol unless directed otherwise by a physician; (2) nurses have easy access to products through automated dispensing machines; and (3) a range of products/interventions are available to accommodate various patient ages and potential staff time constraints.

Medication orders are entered into a computerized system to comply with medication-management standards, which require a pharmacist to review patient information to ensure the appropriateness and safety of the order for each individual patient. Entry into the computer system also permits inclusion of each drug on the patient’s medication-administration record, which allows for proper documentation. The pharmacy department developed predefined order groups, which included only those drugs indicated for a specific patient age group. Directions for the predefined order groups on each medication-administration record were customized further to ensure appropriate nursing directions for administration of a specific agent.

In addition, the pharmacy department prepared batches of buffered lidocaine in prefilled syringes, which were distributed throughout the patient care areas of the hospital. Other medications in the protocol were also made available on the units for easy access.

Results and Assessment
The pharmacy department evaluated compliance with the documentation of age-appropriate medications on each patient’s profile and medication-administration record. Medication-administration records were reviewed for a period of 6 months, and guidance was provided to pharmacists who, on the basis of a review of the medication-administration records, needed to improve their performance. Wastage of expired buffered lidocaine syringes that required disposal was also monitored to help determine a unit’s true use.

Conclusions
The success of the program at TCH can be attributed to a number of factors. The support of hospital administration, including the chief nursing officer and chief executive officer, was a powerful driving force in making pain management a hospital-wide goal. This provided a mandate to accomplish a fundamental change in how peripheral venous access pain was perceived and managed at TCH. By simplifying staff access to pharmacologic interventions, the pharmacy department was instrumental in the implementation and success of the program. With this backing, nursing leadership was able to design and implement a venous access pain-management protocol that ultimately was implemented hospital-wide within a 1-year time frame.
CASE STUDY: MAKING A DIFFERENCE IN THE PERIPHERAL VENOUS ACCESS EXPERIENCE THROUGH A CHILD LIFE APPROACH AT RAINBOW BABIES & CHILDREN’S HOSPITAL

For 27 years, Mary Barkey, MA, CCLS, was a child life specialist at the 244-bed Rainbow Babies & Children’s Hospital (RB&C) in Cleveland, Ohio. Toni F. Millar, MS, CCLS, served as the director of Family and Child Life Services at RB&C until she recently relocated to Morgan Stanley Children’s Hospital of New York-Presbyterian Hospital. At a meeting of the National Association for the Care of Children’s Health in the early 1990s, Ms Barkey and her colleague, the late Barbara Stephens, MAN, RN, presented a 5-part model designed to comfort and help children and their parents cope with procedural pain. The model consists of (1) preparing the child and parent for the procedure and for their roles during the procedure, (2) inviting the parent/caregiver to be present during the procedure, (3) using a treatment room for stressful procedures, (4) positioning the child in a comforting manner, and (5) maintaining a calm, positive atmosphere. The model has been widely implemented by the entire medical staff at RB&C to improve the cooperation of children during painful procedures.

The Role of Child Life Specialists

Using play and psychological preparation as their primary tools, child life specialists help children and their families cope with stressful experiences in the hospital. The last 40 years have witnessed a doubling in the number of child life programs, and most pediatric hospitals now have such programs in place.

Although the overall task of managing pain in children undergoing peripheral venous access procedures is clearly the responsibility of the entire medical team, child life specialists at RB&C help identify appropriate nonpharmacologic interventions to promote successful outcomes. These interventions include providing informative and reassuring psychological preparation before and during painful procedures, helping the child to plan and rehearse coping skills, and encouraging the child to participate in developmentally appropriate play. Because child life programs take a family-centered approach to meeting a child’s concerns, an important responsibility of the child life specialist is to encourage the education, participation, and support of family members during a child’s hospital experience. Overall, the goal of incorporating child life techniques into venous access procedures performed at the hospital is to make the procedure less traumatic for the patient, parents, and staff and to make the overall experience productive, safe, and satisfying.

Before the Procedure

Children benefit from psychological preparation before such invasive procedures as day surgery and venipuncture, and they display significantly less distress before and during the procedure than do children who are not prepared. Preparation benefits the child regardless of his or her gender, ethnic origin, age, injection history, and the tension experienced by the parent.

A child life specialist helps prepare a child by explaining the medical procedure he or she is about to undergo in developmentally appropriate terms. The explanation should include descriptions of sensory experiences, such as what the child will feel, smell, and taste, in addition to procedural information that describes the mechanics of the process. For an IV cannulation, the specialist might say, “When we slip the tube in your arm, you may feel a pushing sensation.” For children receiving oral medications, the specialist might say, “Some medicines have a funny taste; tell me what you think it tastes like.”

The child life specialist assesses a child’s coping abilities and determines the appropriate type and amount of information to provide during the preparation process. For children, the information should be appropriate to their developmental stage, and it should be timed to meet an individual’s needs and preferences. Child life specialists at RB&C have found that 1 child might do well with a lot of information, whereas another might prefer information given in small doses. Language is important as well, because hospital staff often use unfamiliar words to explain what is going to happen.

An important aspect of the family-centered approach of child life programs is that parents are treated as a respected part of the medical team. Instead of “allowing” parents to be present during their child’s procedure, parents are now “invited” to be present and to hold the child on their lap or to hold the child’s hand and talk or listen to the child.

Parents may project their own distress onto their child during a procedure. Therefore, giving parents a supportive role during the procedure, which may help to reduce their own distress, is an important part of the preparation process. Specialists at RB&C have also found that parents can be of value by providing information on previous hospital experiences. Such information can be useful when beginning a painful procedure, because it offers insight into what has worked in the past to alleviate the child’s distress and what might have exacerbated that distress. Another useful strategy is for the child life specialist to ask what the parents do at home when the child is upset, because the same technique can be of value in the hospital setting.

During the Procedure

Using treatment rooms for stressful procedures is an important component of the child life model. The rooms preserve privacy, and they provide a calm soundproof environment. In the case of hospitalized children, moving them from their bed to a treatment room helps to maintain the bed as a safe haven.

A number of nonpharmacologic measures are used by child life specialists to minimize a child’s distress while a procedure is being performed. Key among them is the use of a sitting position in which the child straddles the parent chest-to-chest in a hugging position; this is often termed a “position of comfort.” In addition to the chest-to-chest position, any position that features physical hugging is useful. These positions include having the child’s back to the parent’s chest while sitting on the parent’s lap, having an arm around the child on a bed, or having an arm on the child while sitting side by side in chairs. Distraction, which can include blowing bubbles or playing soothing music, is another successful coping strategy.
technique that is widely used during painful pediatric procedures.25,26

Yet another means of alleviating a child’s distress during a medical procedure is by providing praise to the child for his or her positive behavior.15 Examples include telling the child, “You’re really being very helpful in holding your arm still,” instead of “Don’t move.” Another example is “You and mom are doing a great job together.”

A final component of the 5-part model involves maintaining a calm environment in the treatment room.15 Only 1 person at a time should be speaking to the child. Adults should speak in quiet soothing tones. When voices escalate in volume, there is a greater level of excitement and anxiety.15 Key child life recommendations to be followed by the staff when performing venous access procedures at RB&C are listed in Table 3.

**Promoting Child Life Techniques Throughout the Hospital**

All new nursing staff members at RB&C automatically receive in-service training by a child life specialist on family-centered care, child development, and techniques to comfort children during painful procedures. Demonstrating comfort positions with the use of dolls and a video has proved to be of great instructional value. In addition, new pediatric residents are expected to view a child life training video on these particular topics and on how they can be implemented.

**Advice to Other Hospitals**

The American Academy of Pediatrics supports the use of child life services,18 and although the best guarantee of successfully introducing such practices involves having a child life specialist on staff at the institution, hospitals that are unable to do so can benefit by learning and implementing the child life/family-centered care model. At RB&C, many staff members have used the techniques learned from the child life specialist to the ultimate benefit of the child, the family, and themselves.

**REFERENCES**


On the Front Lines: Lessons Learned in Implementing Multidisciplinary Peripheral Venous Access Pain-Management Programs in Pediatric Hospitals
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