

Original Article

An Institutional Quality Improvement Initiative for Pain Management for Pediatric Cancer Inpatients

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Abstract

Health care institutions must use the principles of quality improvement to demonstrate appropriate assessment and effective management of pain. Here, we describe the quality improvement initiative implemented at our pediatric institution to improve the quality of pain management. We conducted chart audits for the previous 24 hours during which patients received inpatient care. Over six years, 2,478 charts were audited for 87 24-hour periods (average 1.2 days/month) to answer the following: (1) Was pain intensity assessed as per the institutional pain standard of care, (2) What proportion of audited inpatients had significant pain ($\geq 5/10$), and (3) When significant pain ($\geq 5/10$) occurred, was treatment effective (pain score $\leq 4/10$) within one hour of an intervention? Data were analyzed for quarterly time periods ($n = 24$). Compliance with pain assessment guidelines improved from 77% initially to consistently greater than 90%. The mean proportion of patients with significant pain each quarter was 21%. Sixty-six percent of patients with significant pain had pain treated effectively within one hour of intervention. Lack of documentation of pain reassessment within one hour of the intervention was consistent throughout the study period (overall frequency 22%). Comprehensive pain management guidelines have been established. Leaders of health care organizations need to provide the support and resources needed to incorporate these guidelines and standards into institutional culture. We present a simple quality improvement approach to patient care that can be modified to fit the unique aspects of other institutions. J Pain Symptom Manage 2008;35:656–669. © 2008 U.S. Cancer Pain Relief Committee. Published by Elsevier Inc. All rights reserved.

Key Words

Pain measurement, pain assessment, palliative care, quality improvement

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Introduction

Although awareness of the need for assessment and treatment of pain has increased in recent years, unrelieved moderate to severe pain continues to be reported in hospitalized children.^{1–3} Reports of undertreatment of symptoms, even at the end of life, continue to be of concern. When parents were interviewed retrospectively about their perceptions of symptom management during their children's last days, more than 89% felt that their child suffered "a lot" or a "great deal" from at least one symptom, including fatigue, pain, and dyspnea.⁴

Since the early 1990s, several professional organizations^{5,6} have advocated for appropriate treatment of pain in children and adherence to education standards and quality improvement (QI) guidelines for treatment of pain in children. As early as 1992, the American Pain Society (APS) recommended assessment of the existence and extent of pain in institutions as the basis for pain-reduction strategies.⁷ In 1995, the APS Quality of Care Committee published guidelines recommending QI programs for acute pain, including prompt recognition and treatment with appropriate analgesics and other interventions.⁸ The 2005 revisions of these guidelines, based on extensive literature review, expert experience, and consensus among pain experts, further endorsed the principles of QI.⁹ Although the revised guidelines did not differ substantially from the earlier version, they emphasized that health care professionals acting alone often fail to produce system-wide change and that pain-related QI initiatives needed endorsement by institutional leadership. The Joint Commission on Accreditation of Healthcare Organizations (JCAHO)¹⁰ supports activities and resources to ensure that pain is recognized and addressed appropriately. Hospitals are now required to demonstrate timely pain assessment and effective management, using the principles of QI, to ensure that patients have minimal levels of pain.^{11–13}

Institutions that used the guidelines from APS and JCAHO to develop QI initiatives, even when formal educational strategies were included, had only modest success in improving pain assessment rates, and no sustained reduction of pain intensity has been clearly

demonstrated.^{2,11,13–23} These studies have been limited by small sample size, limited settings or patient populations (e.g., cancer pain, postoperative pain), limited representation of children, lack of adequate controls, use of cross-sectional rather than longitudinal design, short follow-up, and limited outcome measures (e.g., asking only if an intervention was offered and not its effectiveness). A national QI project involving 233 hospitals resulted in changes in the structures and practices crucial to improving acute postoperative pain management but failed to reduce pain severity and improve patient satisfaction ratings.²⁴

Experts recommend education about assessment, management, and documentation of pain as a priority for health care organizations.^{11,14,15,18,19,25–27} However, education alone is not enough.^{19,25,28} Pain management professionals assert that sustained improvement in pain management within health care settings requires advancement beyond traditional educational and advocacy efforts. When QI initiatives include additional resources, such as a pain management service or institutionally approved analgesic guidelines, pain intensity is significantly reduced during the evaluation period.^{7,13,20} Improvement of pain management requires a focus on systems of care, including the establishment of processes to support, reinforce, and reward appropriate and effective pain management.^{29–31} Essential elements of such a QI initiative include identification of population-appropriate pain assessment tools, development of pain management documents (pain policies, standards of care, analgesic guidelines), and support for the use of such documents in clinical care, usually under the guidance of an institutional interdisciplinary committee charged with improving pain management.^{8,9,11,19,21,25,27,29,32,33}

Implicit or explicit in the literature discussing QI in pain management is the call for a systematic evaluation of the scope of the problem in each health care delivery system.^{8,9,19,31,34} Recommendations that health care systems provide effective pain relief, develop necessary resources, and identify health care professionals responsible for each aspect of pain management have been specified.^{8,11,24,35} Two basic principles are fundamental to this

process: (1) pain intensity must be assessed at regular intervals by using institution-wide assessment tools and (2) pain must be treated promptly and effectively by using various pharmacologic and nonpharmacologic interventions.^{22,24} Specifically, institutions are encouraged to develop processes to ensure that effective and safe interventions are considered when the intensity of pain reaches a determined threshold.^{7,25} As per the initial APS QI guidelines available in 1995, “a common starting point is to select a pain intensity rating that will elicit an immediate review of treatment, such as a value of ≥ 5 on a 0 to 10 numerical scale.”⁸ APS later added that, clinicians need to determine the appropriateness of an intervention, especially when caring for patients who have some risk of respiratory depression and not react to pain intensity scores only.⁹ Pain intensity scores are used as triggers to alert clinicians about patients’ specific levels of pain. Factors influencing the quality of pain management include frequent reassessments of patients’ responses to treatment and can be described in measures such as the proportion of patients whose pain scores are ≤ 4 out of 10 as a reasonable goal of analgesic therapy.^{13,31}

Sharing the results of any QI project allows better understanding of the current practice within the institution and addresses unmet needs.^{9,19,29} This article describes the development and implementation of our current QI initiative to optimize the quality of pain management and demonstrates the resulting improvement in outcomes at the St. Jude Children’s Research Hospital (St. Jude).

Materials and Methods

Setting

St. Jude is a tertiary care institution with the primary aim of advancing the cure and prevention of pediatric cancer and related hematologic and infectious diseases through research and treatment. Patients range from newborns to young adults at the time of diagnosis. The facility consists of multiple outpatient clinics and three inpatient care areas totaling 60 beds: 38 for hematology and oncology acute care, eight for intensive care, and 14 for bone marrow transplantation. Pediatric oncologists make

referrals to or request consultation from subspecialists, including the pain management service.

Background

In 1996, an interdisciplinary Pain Committee at St. Jude, comprising medical, nursing, pharmacy, physical therapy, psychology, and child life staff, developed an institutional standard of care to promote a consistent approach to pain assessment and management across all hospital units. Over the following four years, this Pain Standard of Care (PSOC) was revised to promote the use of age-appropriate tools for measuring pain intensity. Patients older than 13 years were assumed to understand the numerical rating scale: “From 0 to 10, 0 being no pain, and 10 being the worst pain you could ever imagine having, how much pain are you having now?” For children aged five to 13 years, we used the FACES pain scale, which instructs the child to point to one of a series of faces showing progressive degrees of distress.³⁶ For children younger than five years or incapable to self-report, we selected the FLACC scale, which measures five pain-related behaviors: facial expression, leg movement, activity level, crying, and response to consoling.³⁷ Initially, Wong et al. designed the FACES as a 0–5 scale. Based on the recommendation from Wong to change the scale of 0–5 to a scale of 0–10 to provide a consistent coding system for all pain measurement instruments,³⁸ we modified our data set from 2000 to 2002 by converting the FACES scores of 0, 1, 2, 3, 4, and 5 to 0, 2, 4, 6, 8, and 10, respectively. In 2003, we changed our institutional PSOC and all other institutional resources to use the FACES scale with the 0–10 format, eliminating the need to convert from the 0 to 5 format. By using any one of the three pain assessment tools, clinicians could consistently quantify pain intensity within a 0–10 numerical range. Our PSOC allows for individual variability while choosing the pain assessment tool for a patient, depending on the developmental status of the child. Assessment of pain is required as per our institutional PSOC for all inpatients, regardless of type of pain and even in the absence of pain.

The PSOC indicates that the presence and intensity of pain are to be measured at the time of inpatient admission and at least every

four hours unless the child is asleep, which corresponds to the minimal interval used in obtaining vital signs, thus making the measurement clinically feasible. This approach is supported in the literature.^{5,12,39} It also indicates that the pain intensity has to be reassessed within one hour of any intervention to control pain. We defined significant pain as pain levels ≥ 5 out of 10 for this QI initiative, based on the literature available at the time this project was initiated.^{8,25,33,40} Therefore, the goal of any intervention to treat pain was to decrease the pain score below the level defined as significant pain within one hour of the intervention.

From 1996 to 2000, the Pain Committee provided tools and education to facilitate application of the PSOC by all clinicians. Initiatives included development and distribution of the St. Jude Pharmacological Pain Management Guidelines, which defined the recommended dosage of analgesics and adjuvants and provided an equianalgesic chart for dose conversion of opioids. In response to clinicians' longstanding request for improved access to pain policies and guidelines, laminated cards with information regarding assessment and management of pain were widely distributed. Intranet access to the *Pain Management Manual* and an internal pain management web site have offered further access to current recommendations for clinicians, facilitating bedside decisions about safe and effective interventions to reduce pain.

Initiation of the QI Program and Methods

This study was approved by the St. Jude Institutional Review Board, which waived consent. This QI project proposed to examine whether pain was assessed and managed consistently according to the PSOC by implementing routine standardized chart audits. Over a six-year (72-month) period from July 2000 through June 2006, a chart audit was conducted on dates when time allowed staff nurses assigned to this project to audit all charts of eligible patients. Eligible patients were defined as all patients who had been hospitalized for at least the previous 24 hours, thereby including patients experiencing any type of pain (acute, chronic, continuous, or intermittent) as well as patients who had not reported any pain during hospitalization.¹⁵ The chart auditing

process was conducted to assess compliance with the institutional PSOC and to provide answers to the following five questions:

1. Was pain intensity assessed every four hours when the patient was awake, using age-appropriate scales? Charts that lacked documentation of pain scores for one or more four-hour intervals were coded as "pain assessment not documented according to the PSOC" and were excluded from further analysis, as were charts in which the pain assessment was descriptive and included qualitative notations such as "pain is worse" or "patient looks comfortable," while lacking documentation of pain scores per se. Therefore, only charts in which pain intensity scores were consistently documented every four hours while the patient was awake were examined for the four subsequent questions.
2. What proportion of audited inpatients had significant pain ($\geq 5/10$)?
3. When significant pain ($\geq 5/10$) occurred, was an intervention offered?
4. Was the pain intensity reassessed *within* one hour of the intervention?
5. Was the treatment intervention effective in decreasing pain as per reassessment within one hour? Effective interventions were defined as those that decrease the pain score to ≤ 4 out of 10. The one-hour reassessment interval was chosen to provide a consistent approach for all nonpharmacologic or pharmacologic interventions, allowing for the onset of action of either oral or intravenous medications given as needed for pain.^{7,8,30,39} Pharmacologic regimens could also include medications given on a continuous basis orally, intravenously (continuous infusion or patient-controlled analgesia), epidurally, or transdermally, prescribed by the patients' medical teams by using the tools and educational materials developed by the Pain Committee.

A data collection form (Fig. 1) was developed based on the literature on systematic quality assurance reviews,^{7,32,33} which recommends evaluation by 24-hour periods. The rationale for using 24-hour periods is supported by Ferrell: "One 24-hour period is

EVALUATION OF PAIN MONITORING: INPATIENT 08/2004

Nurse reviewer: _____ Patient initials: _____ MR# _____ Age: _____

Review of pain for last 24 hours from 0700 on _____ (date) to 0700 on _____ (date)

Unit in which patient is located: ☐ 2S ☐ 2N ☐ BMT ☐ ICU

Please answer #1, #3, #4 for each form.

	Yes (✓)	No (✓)	Additional instructions
1. Has the patient had pain intensity assessed by NRS, FACES, or FLACC at least every 4 hours while awake? Circle scale used.			Name of nurse if documentation not complete: _____
2. If a patient had a pain score charted at least every 4 hours while awake, were the scores: • All zeros? or • All within a range of 0–4? or • At least one score ≥ 5 ? or • APP (assume pain present was written as the patient is paralyzed or deeply sedated on a ventilator)			Check beside only one of the bullet points.
3. If pain was > 0 at any time, was the location of the pain documented at least once a shift?			Circle this box if patient too young (< 4 yrs) or ill to verbalize or is paralyzed/sedated
4. If pain was > 0 at any time, was the quality of the pain documented at least once a shift?			Circle this box if patient too young (< 4 yrs) or ill to verbalize or is paralyzed/sedated
5. If the patient had a least one score of ≥ 5 on the pain scale, did the nurse provide an intervention? If yes, circle which of the following was done: • Adm of PRN analgesic or PCA clinician bolus • Encourage patient to boost current PCA • RN obtained new MD order for: • Adding or changing to another analgesic PRN • Changing PCA basal rate • Changing PCA boost dose or frequency • Obtaining a pain team consult • Referral to another discipline: psychology, neurology, social work, other: _____ • Other _____			If checked for at least one “yes,” please answer question #6
6. If #5 is “yes,” was the pain reassessed within one hour of the intervention described in #5?			If checked “yes,” please answer question #7
7. If #6 is “yes,” was the intervention effective as defined as a pain score ≤ 4 or patient asleep within one hour of the intervention?			Thanks!!!!!!

Fig. 1. Data collection form.

sufficient to achieve a reasonable picture of pain management.”⁴¹ Auditing all eligible charts for any one day of data collection minimized any selection bias. The chart auditing process is described as an algorithm in Fig. 2.

To facilitate regular periodic chart audits, we collaborated with nursing directors to train staff nurses to conduct chart audit sampling one to four days per month, as time permitted. The training occurred each time a new nurse

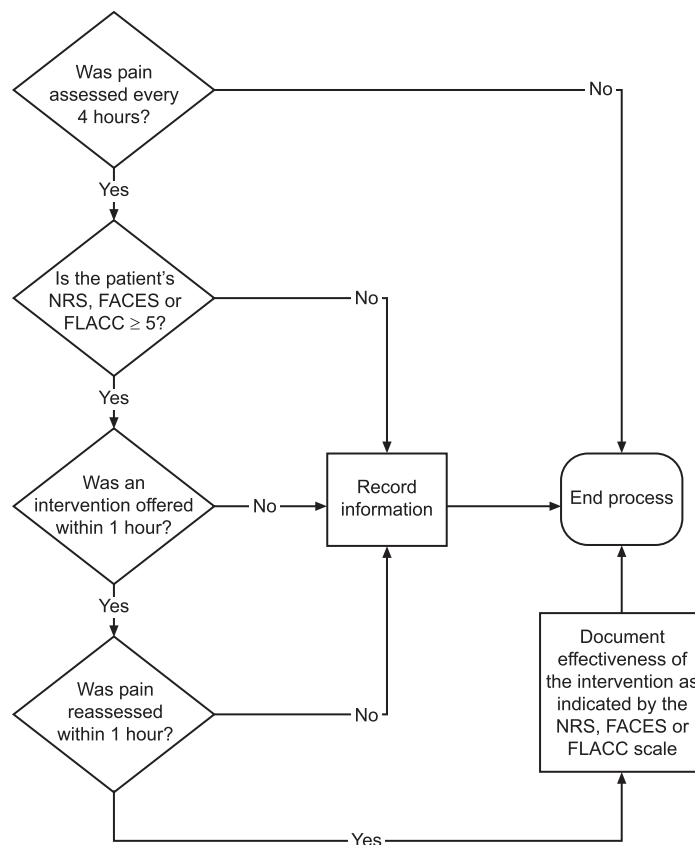


Fig. 2. Data collection process.

auditor replaced an auditor who was no longer assigned to the project, for a total of 10 training sessions over six years. Training consisted of practicing the chart audit tool using charts under the supervision of the Pain Clinical Nurse Specialist (CNS) prior to any actual data collection. Nurse auditors were instructed to discuss any uncertainties about data collection with the Pain CNS, who made the final determination regarding data collection. The days for chart audits varied throughout the six years, based on the availability of nurse auditors to be free of their patient assignments. The nurses were already familiar with documentation forms and processes.

Insight into the type of pain (nociceptive or neuropathic) has been reported to assist with analgesic selection.¹⁷ Therefore, in January 2003, we started to audit compliance with documentation of the location and quality of pain at least once per shift for patients with pain scores other than 0 out of 10. If patients were too young or ill to provide this information,

the fact was noted on the chart audit form and these charts were not rated as having deficient assessment data. Data on assessment of pain intensity, location, and quality were analyzed on the basis of quarterly periods ($n = 24$).

Measures to Improve Pain Management Practices During the Project

We implemented several measures throughout the six-year period to improve the documentation of pain assessment:

- The Pain Management Service CNS sent a memo to each nurse who did not chart pain scores or reassess pain within one hour of an intervention as per PSOC. This measure can improve patient postoperative pain outcomes.³⁹ A list of nurses who were noncompliant with the PSOC was sent to nursing managers on a quarterly basis for inclusion in the nurses' performance evaluations.

- From June 2000 to July 2006, 103 “Pain Pointers” were e-mailed to all nursing staff members. These were brief educational tips on pain management topics identified by monthly QI data as needing improvement, such as appropriate documentation of pain assessment, the need for reevaluation after a pain intervention, age-appropriate pain assessment tools, and quarterly QI results for each inpatient clinical area.
- Signs were posted in elevators, staff lounges, and charting areas to remind staff to follow the PSOC.
- Summarized quarterly results were presented throughout the six years to appropriate nursing committees, the Pain Committee, the Medical Executive Committee, and the Board of Directors of St. Jude, to maintain institutional support for this effort.
- Steps were taken to improve documentation. For example, the nursing flow sheet and the patient-controlled analgesia documentation form were revised to include pain quality and location in addition to pain intensity.
- After networking with other pain experts, we modified the chart audit form to account for patients who were deeply sedated or receiving neuromuscular blockers and could, therefore, not self-report or display pain behaviors. Such patients were evaluated as “assume pain present,” and we ensured that pain interventions were available (e.g., fentanyl infusion for mechanically ventilated patients). These patients were justifiably removed from the chart audit process (range, 0 to four patients per audited day).
- To reduce the incidence of untreated significant pain, nurses and physicians were reminded of alternative measures to reduce pain. For example, while waiting for a patient-controlled analgesia pump, the nurse can contact the physician for an order for bolus doses of opioids from the unit supply. The Pain CNS or the Director of the Pain Management Service counseled individual nurses and physicians regarding the importance of managing pain.

We evaluated if the documentation of assessment of the intensity, quality, and location of

pain improved over the course of the project as a result of the interventions.

Results

Over a six-year period from June 2000 to July 2006, 2,478 charts were reviewed on 87 different days (range, 18–43 charts per review day). The temporal distribution of chart audits was uneven, between 1 and 11 review days per quarter. During the first four years of data collection, nurse staffing patterns were such that the nurse auditors could leave their patient assignments to audit charts at least twice a month. During the last two years, the staffing patterns only allowed the nurse auditors to complete chart audits an average of once a month, resulting in fewer charts audited per quarter.

Compliance with Assessment of Pain Intensity, Location, and Quality

The average percentage of audited charts that documented pain intensity scores every four hours when the patient was awake, using age-appropriate scales as per the PSOC, was 87.37% (2,165/2,478). During the first quarter, only 77% of charts met the criteria. Compliance improved over time to exceed 90% during 11 of the last 12 quarters and to reach or exceed 95% during five of these quarters (Fig. 3). Compliance with documentation of the location and quality of pain was 97% (range, 92%–100%) and 91.3% (range, 82%–96%), respectively, over 14 quarters of data collection (Fig. 4).

Incidence of Significant Pain (Score $\geq 5/10$)

The proportion of inpatients with significant pain ($\geq 5/10$) on any day during the study period was determined from the charts in which all pain scores were documented as per the PSOC (Fig. 5). The mean percentage of patients with significant pain per quarter was 21% (465 of 2,217 patients; range, 13%–40%). During the first two quarters, the mean percentage was 32% (80/247), whereas during the remaining 70 quarters 20% (385/1970) of patients had significant pain on audited days. This finding likely reflects efforts made as a part of this initiative (e.g., presenting the findings to staff or developing resources for medications).

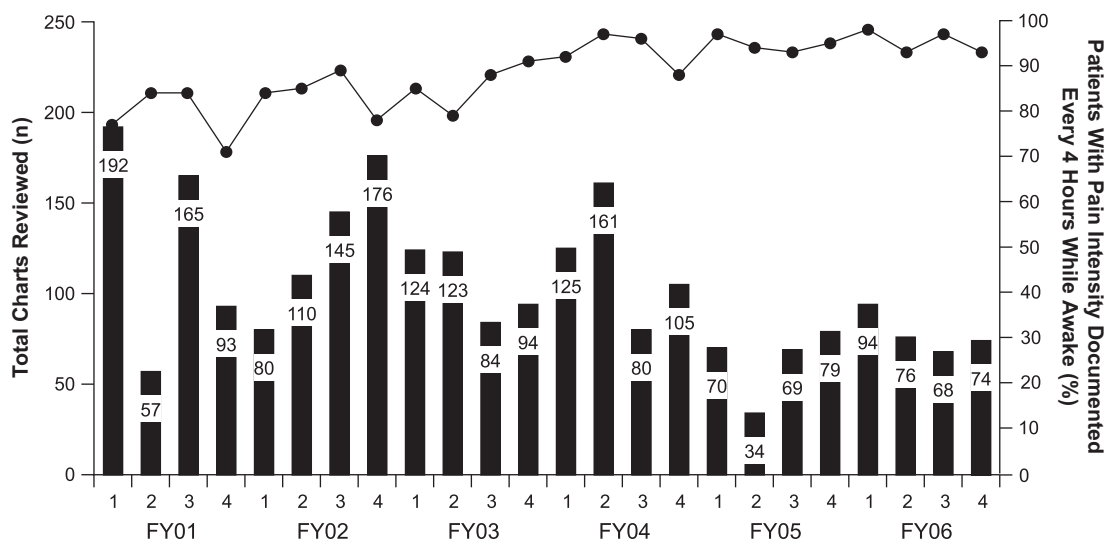


Fig. 3. Documentation of pain intensity (2001–2006).

Documentation of Effective Treatment of Significant Pain (Resulting in Score $\leq 4/10$)

The pain outcomes of patients ($n = 465$) found to have significant pain during the study period were sorted into five groups: (1) patients who had an effective intervention (pain score $\leq 4/10$) within one hour; (2) patients who had no intervention offered for pain; (3) patients whose intervention was ineffective (pain score $\geq 5/10$) within one hour; (4)

patients who had an intervention offered but the patient (or parent) refused; and (5) patients who received an intervention but reassessment was not documented within one hour (Fig. 6). Effective pain management was defined as reduction of the pain score to ≤ 4 out of 10 by any intervention (pharmacologic or nonpharmacologic) within one hour of the intervention. If the patient was asleep during reassessment, the patient's pain was assumed to be ≤ 4 out of 10.

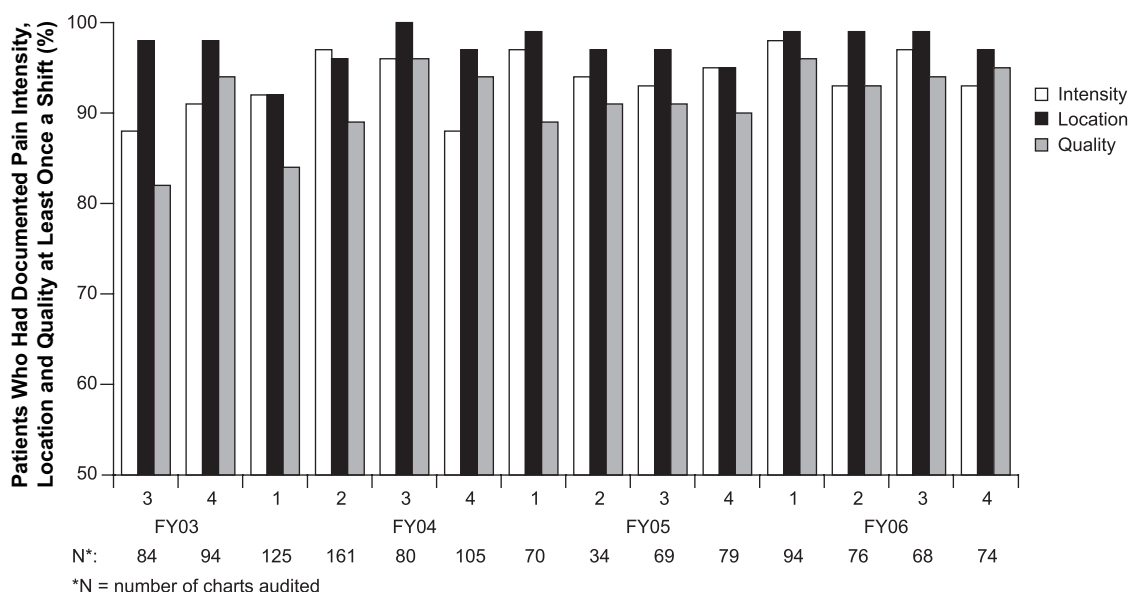


Fig. 4. Documentation of pain intensity, location, and quality (2003–2006).

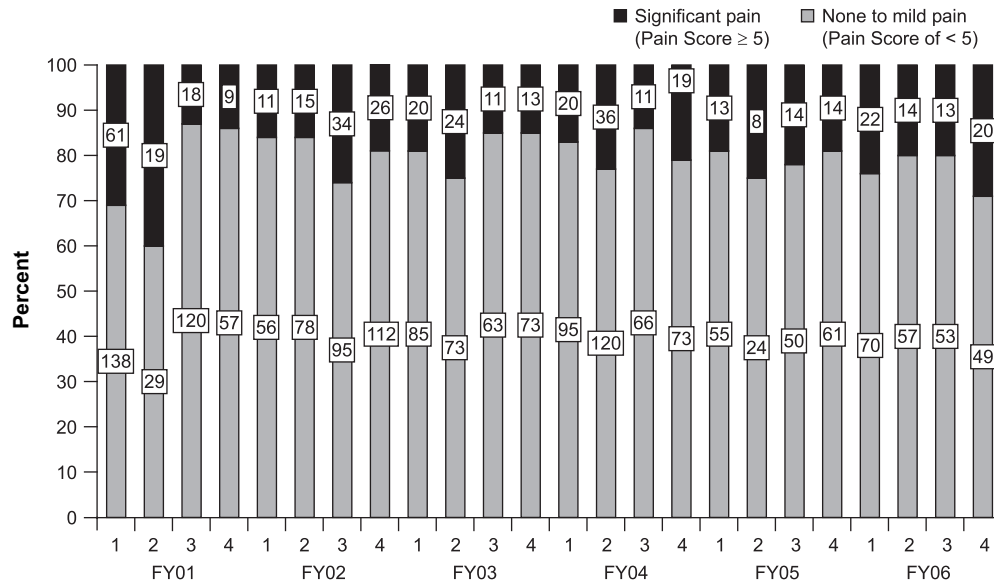


Fig. 5. Incidence of significant pain ($\geq 5/10$) versus none-to-mild pain ($0-4/10$) (2001–2006).

Cumulatively, 66% (308/465) of patients had effective treatment for severe pain (pain score $\leq 4/10$) within one hour (Fig. 7). Seven percent (34/465) of patients received interventions that did not reduce pain (pain scores remained $\geq 5/10$) within one hour. This finding was consistent throughout the 24 quarters of the analysis. Some patients in this group had

severe neuropathic pain that was not relieved until after effective medication regimens (gabapentin, amitriptyline, methadone) were identified and titrated. For other patients in this group, chemotherapy required that opioids and other neuropathic pain medications be temporarily withheld to avoid unacceptable side effects (e.g., altered consciousness due to

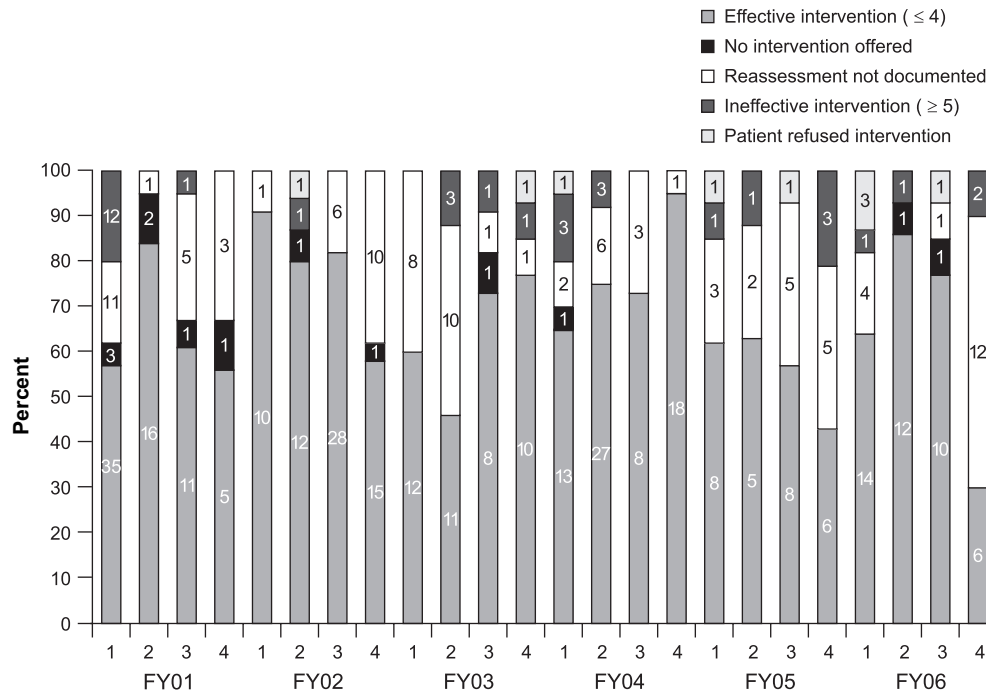


Fig. 6. Treatment of significant pain per quarter ($\geq 5/10$) (2001–2006).

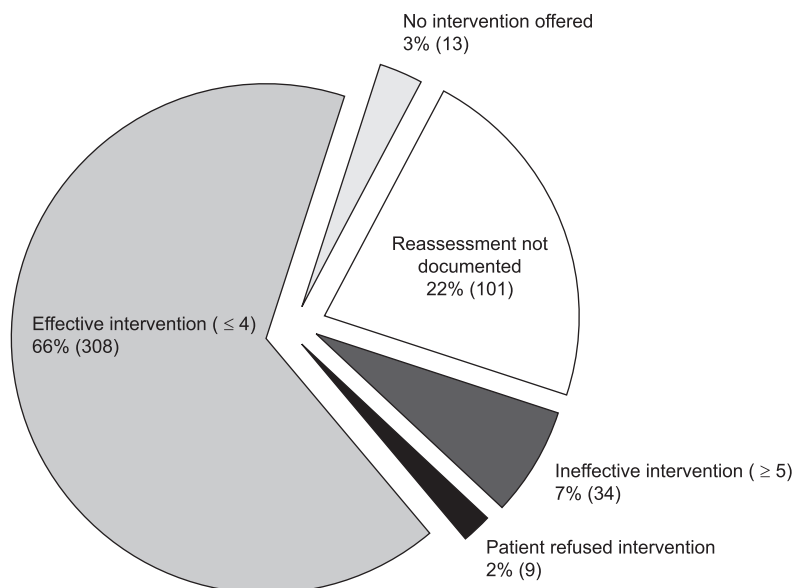


Fig. 7. Treatment of significant pain, cumulative data (2001–2006).

methotrexate toxicity in association with opioids such as methadone).

No intervention was offered to 3% (13/465) of patients with significant pain. Of the 13 patients who did not have an intervention documented, 10 occurred during the first three years and three during the last three years. Most patients in this category had orders for analgesics, and neither the chart documentation nor subsequent interviews with the nurses revealed why an intervention was not offered.

Because the patient population included infants and toddlers, it was difficult in some cases to distinguish agitation from pain on the basis of the FLACC score. In one well-described instance, the nurse attempted to assess, during the hour after intervention, whether the FLACC score of 6/10 reflected pain or another cause. The patient soon developed fever that responded to an antipyretic, and a stronger analgesic was not necessary.

Two percent (9/465) of patients with significant pain declined an intervention, such as a nurse-administered medication or use of a patient-controlled analgesia pump. For these patients, a pain score of 6 or 7 out of 10 was acceptable. This finding may demonstrate the importance of individualizing the “pain goal.”

Documentation of the reassessment of pain within one hour of intervention remained consistent during the entire data collection

period, with an overall occurrence of 22% (101/465; range, 0%–60%) (Fig. 7).

Discussion

Our report describes the development of a Pain Standard of Care within St. Jude, the process of assessment of compliance with the PSOC, and the mechanisms developed to give feedback to clinicians and leaders at our institution about improving pain assessment and management, through an institutional QI initiative. Such QI processes pertain to both adult and pediatric populations according to experts.^{11,24} The solution to inadequate pain relief lies not so much in the development of new techniques as in the better use of existing ones. The importance of interdisciplinary approaches cannot be overemphasized—no single method, individual, or discipline is effective alone. This six-year QI initiative clearly showed the trend of improving the documentation of pain assessment.

Consistency of data collection and analysis was enhanced by having a single clinician, the institution’s Pain CNS (LO), train chart auditors and direct the chart audit process. The nurse leaders’ support in minimizing the turnover of chart auditors resulted in the use of only 10 chart auditors (all staff nurses) throughout the six years.

Efforts must move beyond nurses' assessment and communication of pain to the physician to implementation and evaluation of interventions that are timely, safe, evidence-based, and multimodal. Sustained improvement in patient care is difficult to achieve unless rigorous documentation is mandated and resistance or apathy is overcome. Experts in QI initiatives also stress the importance of redirecting energy from changing individual practices to changing institutional practices in adults and children.^{28,29,32,33} Our QI initiative used a system-wide approach to improve pain assessment and management without focusing on individual performance. The field of pain management should move beyond regulatory compliance (stressing documentation) toward a focus on patient outcomes—responsible, effective, cost-effective, and safe management that reduces an individual's pain to the lowest feasible level.

Some questions remain unanswered. What is the optimal threshold for pain treatment? What number on the pain intensity scale should we strive for to assure patient comfort? When this initiative began in 2000, literature was not available to guide our committee regarding specific grouping of pain scores. Therefore, we decided to divide the data on pain intensity scores into $\leq 4/10$ and $\geq 5/10$ and to define the latter as significant pain for the purpose of this initiative. Data are still insufficient on the degree of pain reduction that is meaningful to patients, especially children, and more research is needed.^{42–44} Data from studies on adults indicate that a 30%–50% reduction in the intensity score is considered meaningful by the patient.^{9,45} Some studies on adults have examined a threshold pain intensity of 4 out of 10 to describe effective pain interventions,^{42,45} while others have found that for severe pain, a reduction of 1.8 points on a scale of 0–10 is the minimal clinically significant decrease in the numerical rating scale score.⁴⁶ In one study of children 8–15 years of age that used a 100-mm visual analog scale, a 10-mm decrease was the minimal clinically significant difference after an intervention.⁴⁷

QI data reflect trends within a setting and do not describe the individual patient's experience. The Pain Committee discussed strategies to improve the pain assessment

documentation and effective management of significant pain. We followed two of the six quality indicators later recommended by APS⁹: documentation of intensity of pain using numeric rating scales and documentation of pain intensity at frequent intervals. Certainly, attempting to eliminate all pain is unrealistic and may lead to unacceptable side effects for some patients. Instead, we recommend that clinicians offer strategies that are evidence based yet individualized for a patient, and always monitor the patient for unacceptable side effects. Optimal pain management includes the prompt treatment of pain, but the factors involved in patients' suffering suggest that we must look beyond the pain intensity score as the sole basis for treatment.⁹ For example, the type of pain (acute vs. chronic) can influence the choice of interventions as well as the expected response. Neuropathic pain does not usually respond to anticonvulsants within an hour. An excessive focus on pain intensity ratings may also lead to overly aggressive use of opioid analgesics, resulting in undesirable side effects (i.e., respiratory depression). Reduction of pain scores may not always require administering more opioids, but may instead be accomplished through more detailed assessment, use of non-opioid analgesics or techniques, and nonpharmacologic interventions. Analgesics may not reduce pain severity if the dose is not titrated or if patients decline treatment.¹⁹ Our QI initiative, like others, showed that we can lower the proportion of patients with moderate to severe pain but not entirely eliminate it, even with the pain management armamentarium currently available.^{9,14,15,17,23,27}

Limitations of This Initiative

This QI project was implemented to meet institutional requirements for the assessment and the prompt and effective treatment of pain. However, we recognize that effective pain management involves more than reduction of a score to less than 5 out of 10. Experts warn that the proportion of patients whose pain is less than 5 out of 10 is not useful as a sole indicator of the quality of pain management for either adults or children within an institution.^{35,43,48} Improving the quality of life and the functional status of patients

involves individual judgment and patient treatment plans.^{22,49}

Another limitation of our process is that it did not include actual observations of nurse assessments or interventions but instead used chart audits. We accepted pain scores that were documented anywhere in the medical record (e.g., in the narrative notes or the vital signs section) by nurses or other clinicians. Other investigators' chart reviews have required documentation in the vital signs section, wherein pain scores are most visible.³³

Because we audited the global pain intensity scores without reference to the admitting diagnosis, other context, or chronic vs. acute vs. procedural nature of the pain, we could not relate the cause of pain to the outcome of treatment. Further, our results clearly are specific to pediatric inpatients being treated for cancer and related conditions at a specialized research institution. This initiative did not focus on high-risk populations such as non-English speaking patients²² or children at the end of life.²

The nature of quality improvement is such that it is very hard to separate the outcomes from the effects of environmental factors. Over the last six years improvements in the management of pain have occurred at St. Jude, such as recognizing the role of methadone in treating neuropathic pain. However, during this time, the institution's nurse to patient ratios, the mission of the hospital, and the pain tools have remained the same.

We recognize that this initiative is only the first step in improving pain management at St. Jude. Our future plan is to monitor the outcome of reassessing pain within one hour by using the recently instituted electronic medication record, which can include built-in electronic reminders for nurses. Our Pain Committee and institutional leadership remain committed to this QI initiative and its expansion to other departments (e.g., ambulatory clinics, postanesthesia care unit).

Summary

Comprehensive pain management guidelines and standards have been established. The leadership of health care organizations needs to provide the support and resources

needed to ensure that these guidelines and standards are incorporated into the institutional culture.^{27,50} We have presented a simple quality improvement approach to patient care that can be implemented institution-wide and modified to fit the unique aspects of other institutions. Our experience and that of other studies, which included both adults and children,^{11,24} continue to show that no single strategy is likely to offer optimal pain management. Quality pain management requires an interdisciplinary approach combining the talents and dedication of every member of the health care team.

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