

Survey of Parental Willingness to Pay and Willingness to Stay for "Painless" Intravenous Catheter Placement

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Objectives: This study examined how much parents are willing to pay and/or willing to stay to make their child's intravenous (IV) catheter placement painless.

Methods: A prospective survey was conducted using a questionnaire administered to a consecutive sample of parents presenting to an emergency department (ED). Eligible subjects were parents accompanying a child 8 years of age or younger. A hypothetical visit to the ED, requiring an IV for their child, was described. Parents were asked if they would prefer to make the IV catheter placement painless and if so, how much of an increase in out-of-pocket cost (none, \$15, and \$100) and/or length of stay they would be willing to incur (no time, 15 minutes, 1 hour). Statistics were chiefly descriptive. Associations of demographic elements with willingness to pay and willingness to stay were analyzed using χ^2 and *t* tests, where appropriate.

Results: One hundred eight subjects were available for analysis. Most parents were mothers (71%), white (53%), and with previous IVs (70%). Most children were boys (55%) with no previous IV placements (55%). The choice of a painless IV placement was independent of demographics and IV experience. Most parents (89%) chose a painless IV placement. Of these parents, 65% chose a willingness to stay of 1 extra hour, and 77% a willingness to pay at least \$15; 37% of parents would pay \$100. Willingness to pay was dependent on both income ($P = 0.014$) and ethnicity ($P = 0.0013$). Willingness to stay was independent of both income ($P = 0.24$) and ethnicity ($P = 0.07$).

Conclusions: Parents are willing to spend both time and money to make their child's IV placement painless. This information should be considered when choosing therapies to reduce the pain of IV placement.

Key Words: intravenous, procedural pain, parent

Placement of an intravenous (IV) line is the most common invasive procedure in the emergency department (ED).¹ Many children receive intravenous lines while in the ED.² Placement of these lines is painful and is a large source of fear and pain.³⁻⁵ In one survey of children admitted to a tertiary care children's hospital, IV placement was the second most common cause of their "worst pain in the previous 24 hours;" only their primary disease was rated as a more frequent cause.⁴ Another study found that 50% of the children aged 2.5 to 6 years old manifested "severe distress

with loss of control" while undergoing a blood draw.³ Interviews with children aged 7 to 11 years old found that needles were the most prevalent source of pain for hospitalized children.⁵

Many aspects of the IV placement contribute to a child's noxious experience. Chief among these are the anxiety and fear that the procedure evokes, as well as the actual nociceptive stimulus from the cutaneous nerves.⁶ The broad number and variety of treatments intended to attenuate the discomfort of an IV placement reflect its myriad etiologies. Such therapies fall into 3 broad categories. First, there are agents that act as local anesthetics (eutectic mixture of local anesthetics (EMLA), intradermal lidocaine, and vapocoolant spray). Second, certain drugs may be used as anxiolytics (nasal/oral midazolam and nitrous oxide). Lastly, there are a number of behavioral approaches including distraction, imagery, and music. Such therapies are applied infrequently, however.^{1,7-10} In this regard, concerted and organized efforts have been required to produce substantive changes in medical caregiver behavior.

These poor rates of use have been attributed to certain barriers. Institutional barriers include inaccessibility to the medications (not on hospital formulary or not stocked in the ED) or policies that discourage their easy usage (physician order required). The attitudes and beliefs of the caregivers constitute another, and perhaps more durable, barrier.¹¹ Examples of such beliefs may be the sense that such therapies require too much time, that only the larger IV sizes hurt significantly, that the degree of discomfort produced by IV placement does not necessitate treatment, or that such therapies make IV placement more difficult. In the case of children, caregivers may also believe that the child will not remember the pain or that "the kid is going to cry no matter what."

It is not clear if the values and preferences of parents would favor the use of preplacement therapies or if they would constitute another barrier.

Previous studies have not addressed the question of how much time parents would be willing to add to the LOS, and how much money parents would be willing to spend, to prevent the discomfort of their child's IV placement. Answering this question would achieve 2 goals. First, it would illustrate the value that parents attach to their child's pain and suffering in this context. Second, it would provide an estimate of the increase in length of stay (LOS) or cost that parents would be willing to tolerate. Such information would be helpful in establishing ED policies for reducing the discomfort of IV placement and other minor procedures.

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This study examined whether parents would, if asked, prefer that their child's IV be "painless." Those parents who indicated that they would consider such therapies were also surveyed to determine the maximum increases in LOS and cost that they would find acceptable.

METHODS

Study Design

This was a prospective survey using a questionnaire administered to a consecutive sample of parents presenting to an ED. Institutional review board approval was granted on an expedited basis with written informed consent not required.

Setting

The survey was conducted in an ED at an urban level I trauma center and tertiary pediatric referral center with an annual census of 60,000 and a pediatric census of 14,000. A dedicated pediatric section of the ED is staffed for 13 hours, from 11AM to 1AM, everyday. Blocks of time, representing the early, middle, and late shifts in the pediatric section, were selected according to investigator convenience and were intended to evenly represent both the days of the week and the hours of the day.

During these blocks of time, all eligible parents were approached.

Selection of Participants

Eligible subjects were parents (or guardians) accompanying a child 8 years of age or younger. Children were identified after triage. Subjects were deemed ineligible if their child either was in need of immediate treatment or had vascular access established before survey administration or if the parent was unable to understand written or spoken English.

Methods and Measurements

The questionnaire consisted of 3 parts. Demographic information about the parent and the child was obtained in the first part.

In the second part, the parent read a short scenario describing a visit to the ED with their child. In the hypothetical scenario, the parent was told that their child required an IV placement. They were informed that they had the option of choosing a "painless" IV start for their child but that such therapies may increase either the cost or the LOS of the ED visit. The term "painless" was chosen to summarize any significant diminution of the child's unpleasant experience, whether through anxiolysis or anesthesia. Although this may conflate 2 distinct aspects of the child's distress, parents are unlikely to distinguish between them. They were then asked to decide whether they "might consider" the painless IV start, or they "would not" consider it.

If they indicated that they would consider a painless IV, they were then asked to choose both the maximum amount of extra time they would be willing to stay in the ED ("no extra time," "20 minutes," or "60 minutes.") and the

maximum amount they would be willing to pay out of pocket for that service ("no extra cost," "\$15," or "\$100"). These categories were chosen to reflect the actual costs and time associated with the various therapies. For instance, our institution charges \$15 for EMLA application, and this agent requires at least an hour for acceptable results. By contrast, the use of vapocoolant spray incurs virtually no extra time or money.

Data Collection and Processing

The questionnaire contained written instructions and was designed to be self-explanatory. Parents were approached after their child had been triaged and were usually found in the examination rooms. Parents were given a brief explanation, and consent was obtained verbally. They were given 5 minutes to complete the questionnaire on their own. If the parent had questions about the survey, the investigator was available to clarify the written instructions. The surveys contained no patient or subject identifiers, assuring anonymity. Survey administration and data entry were conducted by one author (B.W.).

Outcome Measures

The demographic information in part one, the decision to consider a painless IV in part two, and the maximum

TABLE 1. Demographic Information About Parents and Their Children

	Parent Information	Child Information
Median age (SD)	31 (7.8)	3 (2.4)
Parent, no. (%)	—	—
Mother	77 (71)	—
Father	27 (25)	—
Other	4 (4)	—
Missing	1 (1)	—
Child, no. (%)	—	—
Girl	—	48 (44)
Boy	—	60 (56)
Ethnicity, no. (%)	—	—
White	58 (54)	53 (49)
Black	30 (28)	32 (30)
Hispanic	11 (10)	13 (12)
Other	8 (7)	9 (8)
Missing	1 (1)	1 (1)
Had IV in the past, no. (%)	—	—
Yes	76 (70)	45 (42)
No	28 (26)	60 (55)
Missing	4 (4)	3 (28)
Income, no. (%)	—	—
Less than \$20,000	38 (35)	—
\$20,000–\$50,000	39 (36)	—
More than \$50,000	26 (24)	—
Missing	5 (5)	—

TABLE 2. Parents' Choices for Use of Discomfort-reducing Measures

	No. (%)
Would consider a painless IV	—
Would not	12 (11)
Might	96 (89)
Options for those who might consider a painless IV	—
Willing to stay	—
No time	7 (7)
20 Minutes	27 (28)
60 Minutes	62 (65)
Willing to pay	—
No money	22 (23)
\$15	38 (40)
\$100	36 (37)

amount that the subject was willing to pay and willing to stay were used as the outcome measures.

Primary Data Analysis

Statistics were chiefly descriptive. Categorical statistics were analyzed using χ^2 analysis, and continuous data were analyzed by *t* test with significance defined as $P < 0.05$.

RESULTS

One hundred fifteen parents were approached. Of these, 3 were not able to understand the survey, either written or verbal; it was not clear if language was a barrier. Three parents declined to participate. One child was in the ED for a sexual assault examination, and the parent was not approached. In total, 108 parents or guardians completed surveys. All but 2 of the parents were contacted in the dedicated pediatric zone within the ED.

Demographics are shown to Table 1. Most of the parents surveyed were mothers (71%), white (53%), and those who had received an IV themselves in the past (69%). Most children were boys (55%) with no previous experience with IVs. Parent ethnicity was strongly associated with income ($P = 0.0007$), with white parents reporting the highest incomes, and most of the parents in each nonwhite ethnic group reporting incomes less than 20,000.

Most of the parents (89%) said that they would consider making their child's IV painless. Of these parents, a large number (65%) were willing to spend at least 60 extra minutes in the ED, with 93% willing to stay at least 20 minutes. There was no majority choice for the maximum amount of money that they would spend, but 77% of parents were willing to spend at least \$15 out of pocket for the painless IV (Table 2).

The group of parents that said they would not consider the painless IV was compared against the group that said they might, and no significant differences were seen (Table 3).

Willingness to pay (WTP) was associated with parental income ($P = 0.014$) and with parental ethnicity ($P = 0.0013$).

Willingness to stay (WTS), however, was independent of both parental income ($P = 0.24$) and ethnicity ($P = 0.07$) (Figs. 1 and 2).

DISCUSSION

Studies that address how parents value pain relief for minor procedures, in terms of time and money, have been heterogeneous both with respect to the type of procedure and the sort of analgesic or anxiolytic therapy used. Nonetheless, most such studies have indicated that parents would favor these therapies, and our survey extends those findings.

One recent study surveyed parents bringing their child to an ED. The parents were asked if they would be willing to spend \$100 and an extra 30 minutes in the ED to be able to sedate their child for a hypothetical laceration repair. About

TABLE 3. Characteristics of Parents Who Choose to Consider a Painless IV

	Would Not (n = 12)	Might (n = 96)
Parent age (y)		
Mean (95% CI)	30.2 (25.1–35.1)	31.5 (29.9–33.1)
Range	19–38	17–53
Child age (y)		
Mean (95% CI)	4.2 (2.7–5.6)	3.3 (2.8–3.8)
Range	0.2–6	0.05–8
Parent, no. (%)		
Mother	7 (58)	70 (73)
Father	4 (33)	23 (24)
Other	1 (8)	3 (3)
Child, no. (%)		
Girl	4 (33)	44 (46)
Boy	8 (66)	52 (54)
Ethnicity, no. (%)		
White	6 (50)	52 (54)
Black	3 (25)	27 (28)
Hispanic	2 (17)	9 (9)
Other	1 (8)	7 (7)
Missing	0 (0)	1 (1)
Parent has had IV, no. (%)		
Yes	8 (66)	68 (71)
No	4 (33)	24 (25)
Missing	0 (0)	4 (4)
Child has had IV, no. (%)		
Yes	4 (33)	41 (43)
No	8 (66)	52 (54)
Missing	0 (0)	3 (3)
Income, no. (%)		
<\$20,000	6 (50)	32 (33)
\$20,000–\$50,000	5 (42)	34 (35)
>\$50,000	1 (8)	26 (27)
Missing	0 (0)	4 (4)

CI indicates confidence interval.

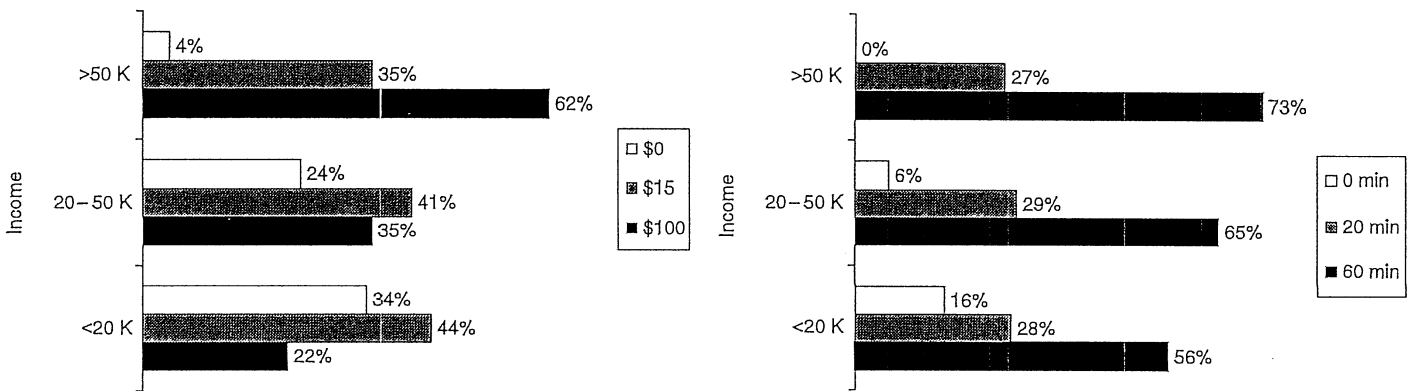


FIGURE 1. Influence of income on WTP and WTS. Values are given as percentages of each income group. K indicates thousand.

75% chose to do so.¹² In another study, parents bringing their children to an outpatient preoperative clinic were asked if they would like their child to have EMLA applied before an actual blood draw. They were informed of the extra time that EMLA would require. Despite this warning about the longer LOS, about 66% of parents chose the EMLA.¹³ On the other hand, another survey of parents in the ED found that twice as many parents preferred infiltrated lidocaine to topical anesthetic (tetracaine/adrenaline/cocaine) for their child's laceration repair. The author concludes that, for parents, the difference in time was the biggest factor in deciding between the 2 anesthetics.¹⁴

Our study adds a unique element to this body of literature. Previous studies have demonstrated that parents prefer analgesic and anxiolytic use in the setting of laceration repair and phlebotomy.^{12,13} No previous study has addressed pain relief in the context of IV placement. Suturing is an activity that takes longer to accomplish than IV placement, is probably more uncomfortable than IV placement, and is dependent on patient cooperation. The use of analgesics and anxiolytics may thus be seen as more valuable for laceration repair than for IV placement. By the same token, phlebotomy may be thought of as too brief and too mild to warrant such therapies. It is significant, then, that parents registered such a strong preference for their child's pain relief in this context.

The present study demonstrates that parents would be willing to spend additional time in the ED and incur additional expense to make a hypothetical IV placement in their child painless. Although the study was underpowered to detect a subtle difference in age between parents willing to consider a painless IV and those who would not, given the similarity between the groups with respect to this demographic measure, we doubt that a real difference exists (Table 3). In our population, income was significantly related to ethnicity, and both were correlated with the WTP. We believe that in all likelihood, WTP was more a function of income than of ethnicity. It is also possible that nonwhite parents, in addition to having a lesser capacity to pay additional costs, viewed pain relief for minor procedures as intrinsically less valuable. The fact, however, that most of each ethnic group and of each income group was willing to spend at least 1 additional hour in the ED mitigates against such an interpretation. If we view time as a currency of which everyone possesses the same amount, it seems that the willingness to "spend" this currency for this purpose is shared equally by members of all ethnic groups studied.

The most important application of our findings may be in refuting objections that doctors or nurses invoke when justifying their failure to use pain-relieving therapies.

Such failures are quite common. In one survey of adult inpatients, only 1% had received a topical anesthetic before

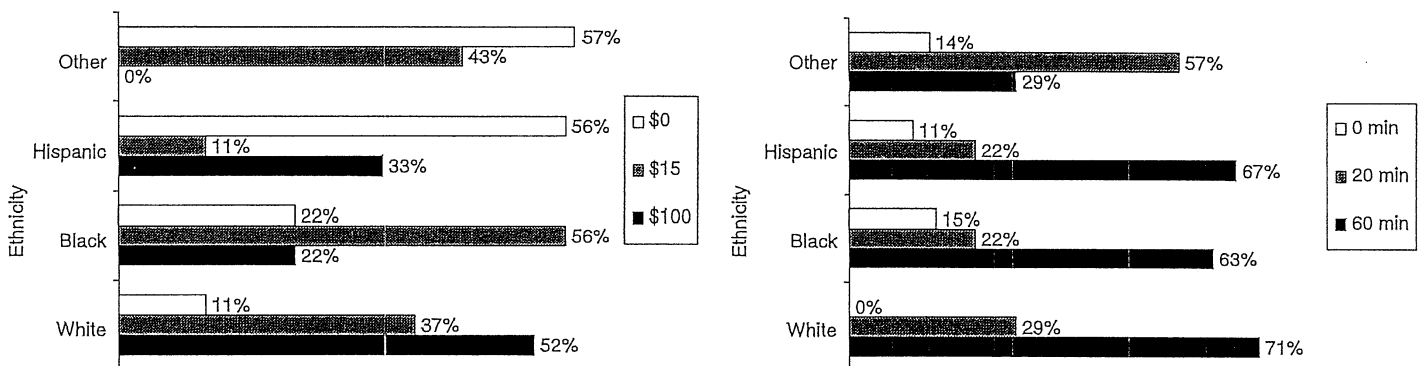


FIGURE 2. Influence of ethnicity on WTP and WTS. Values are given as percentages of each ethnic group.

IV placement.¹⁵ Another survey, of pediatric registered nurses (RNs), found that 54% reported that they used the topical anesthetic EMLA for IV placement on children fewer than once a week.⁸ Only 10% of the nurses felt that the 1-hour application time was not a barrier to its use. In addition, 37% felt that, to some degree, cost influenced their decision to use EMLA. After one hospital enacted a policy that required RNs to offer intradermal lidocaine to all patients receiving an IV, it was found that only 30% of RNs were compliant; 47% of RNs reported that they never offered it.⁷ Objections to complying with the policy included the perception that IV placement was made more difficult and that it was not "part of the routine."

Physicians as well have used such therapies sparingly. In a cohort of house officers, 65% reported that they never used local anesthetics before IV placement. Almost half of these physicians stated that local anesthetics were too time consuming.¹⁰ In another study, anesthesiologists were asked if they were aware of the research showing the benefits of local anesthetic for IV placement.⁹ Only 73% of those aware reported using it, compared with 46% of those who were not aware of the research.

Physicians or nurses may presume that parents, too, have objections to making IV placement painless. They may even think that such objections concern issues of either cost or time. Our study shows that these caregivers would likely be incorrect on both counts.

CONCLUSIONS

Parents are willing to spend both time and money to make their child's IV painless. This information should be considered when choosing therapies to reduce the pain of IV placement.

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