

Effect of a Financial Incentive on Returning for Post-Operative Care Following General Anesthesia

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The aim of this study was to examine whether the use of a ten dollar financial incentive improved parental compliance in returning for their child's post-operative care appointment following dental treatment under general anesthesia at the University of Kentucky Pediatric Dentistry residency program.

Study Design: *Parents/guardians of 69 children scheduled for dental treatment carried out under general anesthesia at the University of Kentucky Pediatric Dentistry residency program from Oct 2007 to March 2008 were offered a \$10 incentive if they returned for their one week post-operative care appointment. All subjects who returned received a \$10 incentive by mail. A control consisting of 100 patients treated at the University of Kentucky Pediatric Dentistry residency program from October 2006 to April 2007 was used to determine historical return rates for post-operative care after dental treatment under general anesthesia.*

Results: *Sixty-six percent (66%) of the control group returned for their post-operative care appointment. Sixty-five percent (65%) of the incentive group returned for their post-operative care appointment.*

Conclusion: *Offering a \$10 incentive did not increase the return rate for post-operative care following dental treatment under general anesthesia in a small study population.*

Keywords: *hospital dentistry/general anesthesia, early childhood caries, health promotion/health services*
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INTRODUCTION

There is a segment of the pediatric patient population that receives dental treatment under general anesthesia (GA). Usually, these patients have early childhood caries (ECC) or are medically compromised. Unfortunately, these patients tend not to return for post-operative care in the pediatric dental clinic. Previous studies show post-operative return rates that range from 29-46%.^{1,2,3,4,5} These high broken appointment rates are of concern because restorative treatment under GA without follow-up preventive care has been demonstrated as an ineffective means of dealing with the ongoing problem of early childhood caries. In one study, over half of a group of Medicaid-eligible children had new lesions six months after treatment under GA.⁴ It is not

uncommon for children to have repeat visits to the operating room due to recurrent decay on teeth that have been previously treated.⁶ These children are still highly predisposed to greater caries incidence in later years.⁷ It has been documented that once children have received comprehensive dental care under GA, there is a trend for many of them to fail to return for any type of follow-up preventive care.^{1,8,9,10} Therefore, it becomes of paramount importance to utilize the post-operative appointment as an opportunity to promote the need for ongoing preventive dental care to patients and their families. It would be beneficial to pediatric dentists to investigate strategies that may potentially improve compliance in returning for post-operative care in this group of patients.

Financial incentives have been used as a means to improve compliance in other fields of study. Individuals will participate in research if they think the benefit (including, but not limited to, monetary compensation) is greater than the cost.¹¹ Monetary incentives have proven successful in encouraging parents to obtain immunizations for their children.^{12,13} Modest financial incentives increased the rate of smoking cessation program enrollment and completion, and short-term quit rates.¹⁴ Greater cocaine abstinence was observed in patients receiving vouchers with a relatively high monetary value.¹⁵ Giving incentives for participation in surveys has long been a common practice. Incentives have significantly greater effects in surveys where the response rate without an incentive is low, and are especially useful in compensating for the absence of other motives to participate.¹¹ The full range of financial inducements (appreciation,

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compensation, and incentives) seems to be represented in the limited data that exists.¹⁶ Martinez-Ebers reported that a \$5 incentive, enclosed with a mail questionnaire, successfully motivated less-satisfied parents to continue their participation in a school-sponsored panel survey.¹⁷ Brealey et al. found that giving patients an unconditional direct payment of £5 for the completion and return of questionnaires significantly increased the odds of response from 78.1% to 88.0%.¹⁸ The use of a financial inducement as a method of improving compliance for care has not been previously investigated in pediatric dental patients and their families.

This financial incentive approach may be of benefit in increasing return rates for the post operative care appointment for children receiving dental treatment under general anesthesia. Increased return rates would allow pediatric dentists an opportunity to encourage regular recall care to potentially decrease the need for additional treatment in the operating room and mitigate the effects of dental disease. The aim of this study was to examine whether the use of a financial incentive in the amount of \$10 improved parental compliance in returning for their child's post-operative care appointment following dental treatment under general anesthesia at the University of Kentucky Pediatric Dentistry residency program (UKPD).

METHODS

The study was approved by the Internal Review Board of the University of Kentucky. A chart review of all 100 patients receiving dental treatment under GA at UKPD from October 2006 to April 2007 was used to determine historical return rates for post operative care after dental treatment under GA. These patients were classified as the historical control group. Parents and/or guardians of all patients receiving dental treatment under GA from October 2007 to March 2008 were asked to participate (n = 69). There were no exclusion criteria for this study. During the pre-operative evaluation visit, all parents /guardians were offered a \$10 incentive if they returned to UKPD for the routinely scheduled one week post-operative appointment. The \$10 amount was derived from previous research studying the use of financial incentives.^{17,18} Additionally, the authors also felt that too high a sum of money would make it impractical for dentists to incorporate an incentive into their practices if this intervention proved to be successful at improving return rates for post-operative care. These 69 patients comprised the incentive group. Subjects who returned for the one week post-operative appointment (n = 45) were mailed a \$10 check.

Statistical Analysis. Data were collected in Microsoft Excel (Excel 2008, Microsoft Corporation, Redmond, Wash.) spreadsheets. Continuous variables were described with means and standard deviations, while categorical variables were summarized with counts and percentages. The chi-square test and the two-group t-test were conducted to assess differences between the historical control group and the incentive group for categorical and continuous variables, respectively. Logistic regression was also performed to determine if incentives had an impact on follow-up after

adjusting for potential confounders. All analyses were conducted using SAS v9.1 and p-values less than 0.05 were considered statistically significant.

RESULTS

The characteristics of the study population (historical control group and incentive group) are presented in Table 1. Patients in the control and incentive groups were similar in age, approximately 6 years old. The two groups were also similar with respect to method of payment. All patients included in the study had either Medicaid or private dental insurance, but nearly all (control: 87%; incentive: 90%) were Medicaid patients. Although there were more males in both the control and incentive groups, slightly more (p=0.51) males were observed in the control group (63%) compared to the incentive group (58%). Although not statistically significant (p=0.38), more control patients (43%) had a higher ASA classification (II/III vs. I) than incentive patients (36%). Those in the control group also reported driving longer (greater than 25 miles) distances more often than the incentive group (control: 60% versus incentive: 44%; p=0.03). Finally, no differences were seen in the rates of returning for post-operative care for incentive versus control patients (control: 66%; incentive: 65%, p=0.92).

Table 2 represents the characteristics of those who returned for the one-week, post-operative care appointment (Follow-up) and those who did not (No Follow-up). Of the 169 patients, 111 (66%) returned for follow-up. There appeared to be no differences with respect to age, gender, or miles traveled for those returning for post-operative care versus those who did not. A marginally significant difference in return rates for patients with a higher ASA classification (II/III) was observed in those with no follow-up (48%) compared to those (36%) with follow-up (p = 0.12). Additionally, it appeared that those who did not return were a higher observed percentage of Medicaid patients (93%) than patients (86%) who returned for post-operative care (p = 0.15).

Based on the results presented in Table 1, the groups were

Table 1. Characteristics of the Study Population

	Incentive (n=69)	Control (n=100)	p-value
Mean Age of Patient (SD)	5.8 (4.4)	6.2 (3.8)	0.52
Gender			
Female	29 (42%)	37 (37%)	
Male	40 (58%)	63 (63%)	0.51
ASA Status			
I	44 (64%)	57 (57%)	
II	25 (36%)	43 (43%)	0.38
Miles traveled			
0-25mi	39 (56%)	40 (40%)	
26-50mi	30 (44%)	60 (60%)	0.03
Payment Method			
Medicaid	62 (90%)	87 (87%)	
Private Insurance	7 (10%)	13 (13%)	0.57
Return for Follow-up			
Yes	45 (65%)	66 (66%)	
No	24 (35%)	34 (34%)	0.92

observed to differ in miles traveled, ASA classification, and gender. From Table 2, there is evidence that ASA status and payment method may be associated with returning for follow-up. Hence, these variables were included in the logistic regression in order to account for potential differences in the composition of the groups (Table 3). After adjusting for these potential confounders, no difference was found between the incentive and control group. However, the difference observed in ASA status ($p=0.13$) and payment method ($p=0.15$) for those who did or did not return for post-operative care remained, but was only marginally statistically significant.

Table 2. Variables in Returning for Post-Operative Care

	Follow-up (n=111)	No Follow-up (n=58)	p-value
Age (Mean SD)	5.87 (3.8)	6.27 (4.5)	0.54
Gender			
Male	69 (62%)	34 (59%)	0.65
Female	42 (38%)	24 (41%)	
ASA Status			
I	71 (64%)	30 (52%)	0.12
II/III	40 (36%)	28 (48%)	
Miles Traveled			
<25	53 (48%)	26 (45%)	0.72
25+	58 (52%)	32 (55%)	
Payment Method			
Medicaid	95 (86%)	54 (93%)	0.15
Private Insurance	16 (14%)	4 (7%)	

Table 3. Results of Logistic Regression

	Odds Ratio Estimate*	90% Confidence Limits	p-value
Incentive (Control vs. Incentive)	1.039	0.593 1.819	0.91
Gender (Female vs. Male)	0.843	0.483 1.47	0.61
ASA (I vs. II/III)	1.671	0.957 2.917	0.13
Miles Traveled (25+ vs. <25)	1.035	0.587 1.822	0.92
Payment Method (Medicaid vs. Private Insurance)	0.426	0.161 1.13	0.15

*Adjusted for all variables in table.

DISCUSSION

Use of a \$10 incentive did not improve the post-operative care return rate. One possible cause for lack of improvement in return rates with the incentive group may have been that the monetary amount of the incentive was too small. Although a \$10 incentive is useful in improving survey participation, studies that improved compliance for health care used higher financial incentives.^{17,18} Immunization status of 2-year-old children in Australia was significantly associated with their parents being aware and knowledgeable about a financial incentive of \$1000 by the federal government.¹³ Quit rates were significantly higher when patients were offered \$200 to successfully complete a thirty day smoking

cessation program.¹⁴ Increasing vouchers amounts from \$499 to \$1995 increased the amount of abstinence achieved during outpatient treatment for cocaine dependence.¹⁵ A higher financial incentive may have been required to improve compliance for post-operative care as opposed to the amount needed to encourage participation in survey research.

The timing of when the incentive was given may also have been a factor. The financial incentive was mailed after patients returned for their one week post-operative appointment instead of being given to the parent or guardian immediately at the pre-operative evaluation appointment. Prepayment financial incentives are more effective than a promised incentive.¹¹ An unconditional incentive promotes social exchange and a sense of reciprocal obligation.¹⁸ Therefore, return rates may have been higher if the effect of the \$10 incentive had been more immediate, like similar studies in which patients are given a financial incentive to be included in a study.

Another possible explanation for poor compliance in returning for post-operative care was the lack of an established relationship with the dental care provider.¹⁰ Typically, patients treated under GA at UKPD are either new patients or referred by outside dentists for treatment. Therefore, the patient's first appointment at UKPD is when they have their pre-operative evaluation. The details of the study were described to the parents or guardians at the pre-operative evaluation by different pediatric dental residents. Therefore, there was no opportunity for families to form a rapport with dental professionals, which could promote parents regarding UKPD as a dental home.

This study took place during fall and winter months (October 07-March 08). Failure to return for post-operative care might have been influenced by inclement weather conditions, missing work, school related activities and holidays. A retrospective chart review of patients treated during spring and summer months (April 07-October 08) had a return rate of 84 %. This is higher than the reported 66% return rate of our control group and the 65% return rate of our incentive group. However, all UKPD return rates are unusually higher than the 29-46% return rates published in other studies with similar patient populations.^{1,2,3,4,5} This factor may have been an important influence. If UKPD return rates had been in the 29-46% range reported in the literature, the incentive might have proved significant. It may be difficult to improve return rates beyond those reported at UKPD. If a similar study was repeated in a clinic where return rates were lower and the financial incentive was higher, improved return rates may potentially be seen.

CONCLUSIONS

1. Use of a \$10 financial incentive did not improve the return rate for post-operative care of patients treated under GA.
2. Further studies are needed to determine effective methods of how to improve return rates for post-operative care in this high risk population.

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