# Intravenous versus Oral Acetaminophen for Post—Tonsillectomy Pain in Children: Which Route Leads to Better Outcomes?

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## Background

- Previous studies found no difference between preop oral acetaminophen and intra-op IV acetaminophen
- IV administration offers superior bioavailability
- Oral elixir provides an immediate soothing effect
- Oral elixir is less expensive than IV administration

**The purpose of this study** was to Elucidate which route of acetaminophen (IV or oral) provided superior pain control for post-tonsillectomy pediatric patients and to evaluate parental satisfaction with different pain control interventions

## Methods

**Design**
- Randomized single-blind study-6/2018 – 11/2022

**Setting**
- Rural, large academic medical center, PACU

**Intervention**
- Administration of IV acetaminophen intra-op or oral acetaminophen elixir post- op

**Outcome Measures**
- Post-operative pain scores (FLACC or 0-10 scale) collected every 15 minutes
- Parental satisfaction survey (0-5 scale)
- Rescue medications administered in the PACU

**Statistical Methods**
- Two sample *t*-test to compare study groups with respect to the area under the curve (AUC) for pain scores as well as parental perception of pain
- Chi-squared test to compare the use of rescue medications in the two groups

## Results

### Demographics

- N=85
  - oral elixir (n=40)
  - IV acetaminophen (n=45)
- 51% Female
- Mean age: 7 years old (sd = 3.5)
- 98% had adenotonsillectomy

There was no difference in gender, age or surgery type between those who received oral elixir and IV acetaminophen

### Pain scores

| | IV Tylenol (n=45) | Oral Tylenol (n=40) | P-value |
|---|---|---|---|
| AUC: Mean (SD) | 1.16 (1.76) | 1.56 (1.83) | 0.311 |
| AUC: Median | 0.25 | 0.75 | 0.217 |
| N (%) AUC = 0 | 21 (47%) | 14 (35%) | 0.275 |

### Rescue Medications

| Medication Given? | IV | Oral | P- value |
|---|---|---|---|
| No | 18 (40%) | 28 (70%) | |
| Yes | 27 (60%) | 12 (30%) | 0.006* |

Although there were no statistically significant differences in pain scores, children who received oral acetaminophen required fewer rescue medications.

### Parental Satisfaction

There was no difference in parental satisfaction between those whose children received IV and oral acetaminophen.

**Satisfaction with pain control in recovery room**

| | IV | Oral |
|---|---|---|
| 0 | 2 (4%) | 0 (0%) |
| 1 | 1 (2%) | 0 (0%) |
| 2 | 0 (0%) | 1 (3%) |
| 3 | 5 (11%) | 7 (18%) |
| 4 | 13 (29%) | 8 (20%) |
| 5 (Very Sufficient) | 24 (53%) | 24 (60%) |

P=0.627*

**Satisfaction with effort to control pain in recovery room**

| | IV | Oral |
|---|---|---|
| 3 | 1 (2%) | 1 (3%) |
| 4 | 4 (9%) | 2 (5%) |
| 5 (Very Sufficient) | 40 (89%) | 37 (92%) |

P = 0.584*

**Likelihood of recommending pain control method to others**

| | IV | Oral |
|---|---|---|
| 1 | 1 (2%) | 0 (0%) |
| 2 | 0 (0%) | 1 (3%) |
| 3 | 1 (2%) | 5 (13%) |
| 4 | 9 (20%) | 6 (15%) |
| 5 (Very Sufficient) | 34 (76%) | 28 (70%) |

P = 0.439*

## Conclusions

- Healthcare providers caring for pediatric post-operative tonsillectomy patients should be aware that IV and oral acetaminophen are equally effective.
- Children receiving IV acetaminophen intra-operatively may require rescue medications more frequently
- Nurses can tailor plans of care to manage post-operative pain in order to optimize pain relief and parental satisfaction

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