INTRODUCTION
Difficult intubation is not uncommon in children with craniofacial abnormalities. However, the incidence of unanticipated difficult intubations in a healthy population is not known. Objective pre-operative parameters that may predict difficult intubating conditions are poorly understood (1). The aim of this study was to prospectively evaluate children presenting for ambulatory surgery, to determine the incidence of unanticipated difficult intubation, and to establish any pre-anesthetic measurements that may predict difficult intubating conditions.

METHODS
Following approval by the Institutional Review Board, 1000 pediatric patients ≤ 18 years, presenting for ambulatory surgery were enrolled. Children with neck instability, developmental delay or cardiac disease were excluded. Patient demographics were recorded. The following preoperative measurements were obtained: Mallampati (MP) classification, inter-incisor distance, mandible, thyromental (TM) and sternomental (SM) distance. Anesthesia was induced with sevoflurane in nitrous oxide and oxygen, patients received propofol or muscle relaxants for intubation which was performed in the sniffling position. The Cormack-Lehane (CL) grade, number of intubation attempts, use of a stylette, and cricoideal pressure were documented. CL grade III or IV was categorized as having potential for difficult intubation. Difficult intubation was defined as the presence of all the following: greater than one attempt, CL grade III/IV, stylette use, and application of cricoideal pressure.

RESULTS
Of the 1000 patients enrolled, 887 had complete data for analysis. Demographic data are displayed in Figure 1. The incidence of difficult intubation was 0.56%. Distribution of Mallampati classification is shown in Figure 2. Only 0.8% of patients had a potential for difficult intubation (CL grade of III/IV) – Figure 3. No association between CL grade and BMI %ile, Mandibular length or sternomental distance was found. There was a statistically significant correlation between MP classification and CL grade (p<0.0001). However, the degree of correlation was weaker in the 3-10 year age group (rho 0.16) than in the 11-18 year age group (rho 0.38). The MP could not be reliably obtained in children 0 – 2 years old. A shorter TM distance was also associated with a higher CL grade in children 3-18 years old (Figure 4). There was no relationship between TM distance and CL grade in the 0-3 age group.

Figure 1: Patient Demographics

Mean Age (yrs) 7.8 ± 4.1

Male: Female 54%: 46%

Mean BMI (percentile) 58.5 ± 33.6

Table 1

<table>
<thead>
<tr>
<th>Mallampati Classification</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>511 (57.6%)</td>
</tr>
<tr>
<td>2</td>
<td>183 (20.6%)</td>
</tr>
<tr>
<td>3</td>
<td>29 (3.3%)</td>
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<tr>
<td>4</td>
<td>12 (1.4%)</td>
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</tbody>
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Figure 2: Mallampati (MP) Classification

CONCLUSIONS

- Incidence of unanticipated difficult intubation in children presenting for ambulatory surgery is low.
- Mallampati classification has a better correlation with CL grade in children 11 years and older.
- In children ages 3-10, the TM distance may be more useful in identifying those with high CL grades. No preoperative measurement was useful in children under 3.
- We found that obesity alone was not a predictor of difficult intubating conditions or difficult intubation, which confirms findings in adult studies (2).

REFERENCES