

# Novel Distraction Technique for Pediatric Pre-operative Anxiety Prevention

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## Abstract

**Objectives:** To evaluate the level of operative anxiety in children ages 2 – 10 who receive a “balloon” toy made of the reservoir mask and ventilation mask.

**Aim:** To determine if our novel “balloon” technique distracts children from becoming anxious more than children who simply receive a mask pre-operatively.

**Background:** The practice of our institution has been to introduce the face mask to the patient prior to entering the OR in efforts to make their experience less traumatic. We have improved upon this method by attaching the anesthesiologist's reservoir bag to the face mask while the patient is in the holding area. This simple novel technique gives the patient the entertaining distraction of blowing up a “balloon”.

**Methods/ Materials:** This was a prospective study involving 42 children age 2-10 yr of age randomized into two groups, either receiving the face mask or the “balloon”. The anxiety of the participants was measured with the Modified Yale Preoperative Anxiety Scale (mYPAS). The anxiety level was observed and recorded in the holding area and on initiation of induction. A higher score on the scale denotes a higher level of anxiety.

**Results:** The children receiving the balloon showed significantly less anxiety than their counterparts in the OR.

**Conclusions:** Our novel balloon technique introduces parts of the ventilator as toys so that induction is no longer an anxiety provoking event.

## INTRODUCTION

Surgery can be an anxiety provoking experience for children of all ages and can lead to postoperative behavioral problems that include learning disabilities, nightmares and eating disorders. (1) Many successful ways of preventing such anxiety have been devised. Midazolam has been shown to decrease pre-operative anxiety, but the short half-life and possible side effects do not make it suitable for every patient. (2) Distraction techniques such as magic tricks or video games, keep the patient's mind off the anxiety provoking experience; however, these techniques are time consuming and sometimes expensive. We have devised a simple distraction technique that allows the pediatric patient to see the parts of the anesthesia apparatus as toys. The

purpose of the present study was to determine if the novel technique prevents anxiety more than our institution's older technique of preoperative anxiety prevention.

## MATERIALS/METHODS

This study was approved by our institution's IRB. A parent or guardian provided written informed consent for child participation. Children between the ages of 8 and 10 provided signed assent as well. The total study population was 42 ASA I and II children ages 2 to 10. Children who underwent a previous procedure requiring anesthesia after 2 years of age were excluded because they may have developed anxiety issues. We enrolled patients for any type of non-emergency procedure in which the patient did not

already receive narcotics or sedatives in the holding area. Exclusion criteria included children with mild to moderate mental retardation and physical handicaps such as complete blindness and/or deafness without sign language skills. The children were randomized into two equal groups of 21 patients; the types of surgeries did not differ between the groups. Each patient randomly received one of two items 15 minutes prior to entering the operating room. One group received the ventilation mask with bubble gum flavoring which has been part of our institution's practice. The other group received the flavored mask with the reservoir bag attached to the mask. A picture or sticker(s) were also attached to the reservoir bag to make it more entertaining. The apparatus was then introduced to the patient with the instructions to play with the "balloon". (Picture A)

Figure 1



The anxiety scores were recorded for each subject after fifteen minutes when the anesthesiologist returned to the holding area to bring the patient to the operating room. Once in the operating room accompanied by a parent or guardian, the same mask with/without a reservoir bag was attached to the ventilator. The patient was instructed to breathe into the circuit and watch the "balloon machine" blow up his/her

balloon. A second evaluation was performed at this time. The mYPAS was used to evaluate anxiety in both the holding area and the operating room. The mYPAS scores anxiety in five categories: activity (scored 1-4), vocalizations (1-6), emotional expressivity (1-4), state of apparent arousal (1-4) and use of parent (1-6). A higher score signifies a higher level of anxiety (3).

Data was collected for each category of the mYPAS for the two groups: mask and "balloon". Each group was subcategorized for data collected in the holding area versus data collected in the operating room. The mean of each mYPAS category was calculated and the two groups were compared using the student t test.

Subject Studies: The total study population was 42 ASA I and II children ages 2 to 10. Twenty patients were male, twenty two patients were female.

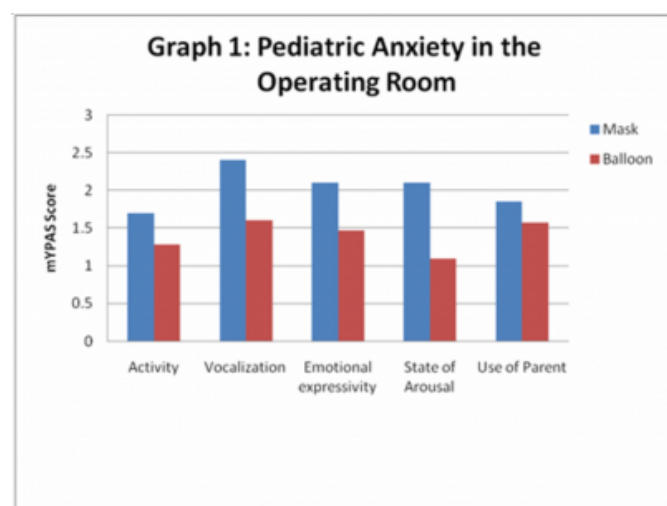
RESULTS

A comparison between the two groups shows that the group receiving the balloon was less anxious in the OR (Graph 1). Both groups have a lower level of anxiety in the holding area compared to the OR but this was not statistically significant. We also did not see a statistical difference in the anxiety level for the balloon group between the holding area and the OR (Table 1).

Figure 2

Mask Group n=21					
	Activity	Vocalization	Emotional expressivity	State of Arousal	Use of Parent
Location					
Holding Area	1.8	2.1	1.85	1.7	1.85
OR*	1.7	2.4	2.1	2.1	1.85
Balloon Group n=21					
	Activity	Vocalization	Emotional expressivity	State of Arousal	Use of Parent
Location					
Holding Area	1.3	1.57	1.28	1.3	1.35
OR*	1.28	1.6	1.47	1.1	1.57
(values expressed in means)				(*P<.05)	

**Figure 3**



### DISCUSSION

In this prospective study, we tested our novel technique for distracting children from preoperative anxiety using the mYPAS. We found that the children who became acquainted with the balloon fifteen minutes prior to entering the OR were more distracted and less anxious. Our study shows the added benefit children receive by introducing more pieces of the ventilator as toys in the holding area. Children may still have a heightened degree of anxiety when moving from the holding area to the OR, but they are able to concentrate on their balloon once in the foreign environment. Our technique is simple and safe since it only involves attaching the reservoir bag to the mask. It is also economical since the same mask and reservoir bag introduced in the holding area

can be used for the procedure. The anesthetist also does not have to spend additional time with the patient as with other distraction techniques, i.e.: magic tricks.

A limitation to our study was that our novel technique was only studied against our institution's basic concept of anxiety prevention: the ventilation mask with flavoring. We did not test the balloon technique against other distraction techniques or pharmacological techniques. We also did not follow up with our patients post-operatively to assess their anxiety levels. Parental anxiety, which can influence how the child perceives the surgical setting, was also not considered in our study. (4)

Based on our findings, we suggest the combination of the reservoir bag attached to the mask be given to any child ages 2 to 10 as a means of preoperative anxiety prevention. Our novel balloon technique is a safe, inexpensive and a time saving technique. We plan on continuing to study the balloon technique against other anxiety prevention techniques.

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