

# Use of Subcutaneous Scopolamine in Pediatric Patients at High Risk for PONV. A Report of 4 Cases.

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**ABSTRACT BODY:** Postoperative nausea and vomiting (PONV) can be a significant source of distress for patients. This is especially true when an unanticipated admission results following an ambulatory procedure. In pediatric patients, the impact may be felt by the entire family as costs to the patient are increased, and time constraints in today's busy society can cause increased stress for providers. The following 4 cases illustrate the increased costs and family distress that can result from PONV and a simple, cost-effective solution in these patients at high risk for PONV.

**CASE REPORTS:** Patient one is a healthy 6 yo, 22 kg male who presented for tissue rearrangement to the left face. Following a prior procedure on the face, the patient had to return following discharge and was admitted for PONV. During preoperative assessment, the patient's mother asked if a "motion sickness" patch could be used on the patient. The scopolamine patch is not approved for use in children; however, upon internet inquiry, the IM, IV, or SC dose of scopolamine for antiemetic effects in children was determined to be 6 mcg/kg/dose with a maximum of 0.3 mg total (1). The patient underwent a mask induction with 8% sevoflurane in oxygen. Intravenous access was obtained and a propofol infusion started at 25 mcg/kg/min. Endotracheal intubation was facilitated with mivacurium. Anesthesia was maintained with propofol and 2% sevoflurane in oxygen. The patient also received ondansetron 4 mg IV, dexamethasone 4 mg IV, and scopolamine 0.14 mg SC in the left forearm approximately 15 minutes prior to the end of the surgical procedure. Local anesthesia and intravenous morphine 1 mg was used for postoperative pain control. In the PACU, the patient experienced no feelings of nausea and had no episodes of emesis. The patient was discharged from the PACU after oral fluid intake. Upon postoperative follow-up by phone the next day, the patient's mother reported no PONV.

Patient two is a healthy 5 yo, 26 kg male who presented for secondary cleft lip repair. Following his first cleft lip and palate repair, the patient had significant PONV that lasted for several days. The parents managed his symptoms at home but wished to avoid a recurrence of this postoperative experience. This patient was premedicated with oral midazolam. Anesthesia was induced by mask with 8% sevoflurane in 70% nitrous oxide and 30% oxygen. Following endotracheal intubation facilitated with cisatracurium, anesthesia was maintained with a propofol infusion at 200 mcg/kg/min and 1% sevoflurane. The patient received 160 mcg SC and 8 mg dexamethasone IV at the beginning of the 3 hour procedure. Fifty minutes prior to arrival in PACU, ondansetron 4 mg IV was administered. The patient was discharged in a symptom free state and had normal oral intake on 24 hour follow-up by phone.

Patient three is a 7 yo, 23 kg female diagnosed with pre-B cell ALL. She currently presents monthly for lumbar puncture and intrathecal chemotherapy. After each procedure, the patient had significant PONV as well as headache. Following 7 out of the 8 previous procedures, she required admission for symptom control. Multiple techniques were used to ameliorate the patient's PONV without much success until scopolamine was added. The patient had previously been given dexamethasone, granisetron, and diphenhydramine for PONV. These drugs were repeated intravenously following a mask induction with 8% sevoflurane in oxygen. After IV placement, propofol 2 mg/kg was given to facilitate placement of an LMA. The patient also received 10 mcg/kg of SC scopolamine while anesthetized. The patient experienced slight nausea and headache in PACU but no emesis. The patient was discharged and was "doing fine" according to mom the next day. The next month, the patient did

not receive SC scopolamine but did receive a scopolamine patch postoperatively. She was able to be discharged. The following month, the patient arrived with a scopolamine patch that had been ordered by her hematologist and placed the previous night. She was discharged following this procedure as well.

The final patient is a 48 kg, 14 yo female status post living related donor renal transplant for ESRD secondary to focal segmental glomerulonephritis. She had undergone peritoneal dialysis prior to transplant and was presenting for scar revision of this site. She had a significant history of PONV despite a multi-modal approach to prophylaxis. After discussions with the patient and her parents, we decided to use subcutaneous scopolamine as an additional measure. The patient underwent mask induction with sevoflurane in oxygen. After iv placement, propofol 2 mg/kg was used to facilitate placement of an LMA. Dexamethasone 8 mg and ondansetron 4 mg was given IV at the beginning of the case as was scopolamine 300 mcg subcutaneously to right arm. An additional 4 mg ondansetron IV was given at the end of the procedure as was 2 mg morphine for pain relief. Local anesthetic was used by the surgeon. The patient had no PONV in the PACU and was discharged home. She had no PONV and maintained normal oral intake on next day follow-up by telephone.

**DISCUSSION:** Transdermal scopolamine has been shown to be effective for PONV in children (2, 3) although description of its use in the English anesthesia literature seems somewhat limited. This series of 4 cases describes the use of subcutaneously injected scopolamine as part of a multimodal approach for the prevention of PONV in pediatric patients that would be considered at high risk for PONV. In all 4 cases, scopolamine proved to be an effective component in preventing or greatly reducing PONV. More study should be undertaken to determine the most effective use of scopolamine in pediatric patients at high risk for PONV.

REFERENCES: (1) [www.utdol.com](http://www.utdol.com)

(2) Horimoto Y. et al, Can J Anaesth 1991

(3) Doyle E. et al, Br J Anaesth 1994