

**National Essential Medicine List Medication Review Process**  
**Adult Hospital Level**  
**Component: Anaesthesiology**

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**Date of review:** 12 March 2015

**Medication name:** Droperidol

**Executive summary:** Postoperative nausea and vomiting is common and dreaded by patients. It may have significant adverse consequences. Postoperative opioid use is a significant risk factor. Prophylaxis and treatment of nausea and vomiting is multimodal, using up to four drugs. Droperidol is the most effective agent when used in conjunction with patient controlled opioid analgesia, a common and effective technique.

**Indication:** Prophylaxis of postoperative nausea and vomiting

Introduction and contextualisation: Postoperative nausea and vomiting (PONV) is common, occurring in 12-38% of all cases. The incidence in high-risk patients is 60-70%. Nausea and vomiting is unpleasant and may have significant adverse consequences such as aspiration of gastric contents, wound dehiscence, increased bleeding and raised intracranial and intraocular pressure. Prevention includes risk reduction strategies such as avoidance of triggering agents as well as pharmacological prophylaxis, using combinations of up to four drugs.

Droperidol was the most widely used agent for PONV prophylaxis until 2001, when the FDA released a black box warning relating to cardiovascular events due to QT interval prolongation. This was based on 65 cases, only 2 of which involved a dose of droperidol at doses commonly used for PONV prophylaxis. The most commonly used replacement for droperidol is ondansetron, which has the same incidence of QT prolongation as droperidol. The three most widely used drugs, dexamethasone, droperidol and ondansetron each decrease PONV by about 25%, with effects being additive.

Droperidol is the most effective drug when used in combination with morphine in patient controlled analgesia. Evidence for other agents is limited. Ondansetron has been used at doses of 200mg/ml. This would require 20mg of ondansetron (Five 4mg ampoules) to be added to 100ml of morphine. Droperidol is effective at 25µg/ml, requiring 2,5mg (1ml = half an ampoule) per 100ml of morphine. Droperidol has also been shown to decrease morphine induced pruritus, while ondansetron is ineffective for that indication.

**Search strategy:** An electronic literature survey for the following terms was performed using Pubmed.

Droperidol [Title] AND Review (last 5 years)

Droperidol [Title] and postoperative [Title] (last 5 years)

Ondansetron [Title] AND Review

Droperidol [Title] and PCA [Title]

Ondansetron [Title] and PCA [Title]

**Selection of studies:** Ten papers were found to be relevant.

**Evidence synthesis:** Postoperative nausea and vomiting is complex, involving multiple triggers and neurotransmitters. Current practice involves the following principles: Identification of patients at risk using clinical risk scores, limiting triggering agents in high risk patients, provision of prophylaxis involving multiple agents and treatment of established nausea and/or vomiting.

The efficacy of droperidol is similar to ondansetron for PONV prophylaxis, with a number needed to treat (NNT) of approximately 5 for prevention of nausea and vomiting (0–24 hours). The number needed to treat to prevent early nausea in high risk patients is 2, while the number needed to treat to prevent early vomiting in high risk patients is 4. Use of prophylaxis has been found to be cost-effective compared with use of rescue anti-emetics, but this has not been demonstrated in a local context.

The risk of QT prolongation is low if the dose is limited to less than 1mg or 15µg/kg. The risk of QT prolongation is similar for droperidol and ondansetron and is not increased by using the drugs in combination.

Droperidol is effective for PONV prophylaxis when added to opioids in a PCA device (patient controlled analgesia). The dose range is 25-100µg/ml, with lower doses favoured to minimise side effects, such as sedation, agitation and extrapyramidal reactions. Ondansetron has been found to be effective in reducing PONV when added to a PCA at doses of 200mg/ml. No head to head comparison of ondansetron and droperidol when added to PCA's was found.

Ondansetron is an effective treatment for established postoperative nausea and vomiting. Evidence for the use of droperidol as treatment is limited, but efficacy appears to be similar to ondansetron.

**Evidence quality:** Three articles were meta-analyses and one was a consensus guideline issued by the American Society of Anesthesiologists (endorsed by the South African Society of Anaesthesiologists). Droperidol has a long history of widespread use with a good evidence base supporting its efficacy.

**Alternative agents:** Ondansetron and dexamethasone may be used as sole agents in intermediate risk patients, but drug combinations are required in high risk patients.

**Summary:** Droperidol is an effective and safe agent for prophylaxis of postoperative nausea and vomiting.

**Recommendation:** Droperidol should be available for prophylaxis against post-operative nausea and vomiting. It may be used as a sole agent in patients at intermediate risk, but should be used in combination with other agents for high risk patients. The dose should be limited to <1 mg in adults and <15µg/kg in children. It should possibly be a second-line agent in children, where a combination of dexamethasone and ondansetron may be preferred. It may be a useful option for treatment of established post-operative nausea and vomiting, especially if it was not used for prophylaxis. It is the agent of choice combined with opioids in patient controlled analgesia.

## References:

- 1) Schaub, Isabelle; Lysakowski, Christopher; Elia, Nadia; Tramer, Martin R. Low-dose droperidol ( $\leq 1$  mg or  $\leq 15$   $\mu\text{g kg}^{-1}$ ) for the prevention of postoperative nausea and vomiting in adults: quantitative systematic review of randomised controlled trials. *European Journal of Anaesthesiology*. 29(6):286-294, June 2012.
- 2) McKeage, K., Simpson, D., & Wagstaff, A. J. (2006). Intravenous droperidol: a review of its use in the management of postoperative nausea and vomiting. *Drugs*, 66(16), 2123+
- 3) Gan TJ, Diemunsch P, Habib AS, et al.. Consensus guidelines for the management of postoperative nausea and vomiting. *Anesth Analg*. 2014;118:85–113.
- 4) Chandrakantan A, Glass PS. Multimodal therapies for postoperative nausea and vomiting, and pain. *Br J Anaesth*. 2011 Dec;107 Suppl 1:i27-40.