Clinical Guideline for the management of post-operative nausea and vomiting in adults and children

Document Control:

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Version	Date	Author	Reason/Change
V1.0	Dec 2017	Dr H Goddard	To originate document
V1.1	Dec 2019	Dr H Goddard	No changes
V2.0	November 2023	Dr Helen Goddard	Addition of guidance for pregnancy and breastfeeding and correction of Paeds doses and post operative prescription.

Previous Titles for this Document:

Previous Title/Amalgamated Titles	Date Revised
None	Not applicable

Distribution Control

Printed copies of this document should be considered out of date. The most up to date version is available from the Trust Intranet.

Consultation

The following were consulted during the development of this document:
all anaesthetic consultants, including the clinical director, paediatric anaesthesia lead, obstetric anaesthesia lead and lead pharmacist for theatres

Monitoring and Review of Procedural Document

The document owner is responsible for monitoring and reviewing the effectiveness of this Procedural Document. This review is continuous however as a minimum will be achieved at the point this procedural document requires a review e.g. changes in legislation, findings from incidents or document expiry.

Relationship of this document to other procedural documents

This document is a clinical guideline applicable to Norfolk and Norwich University Hospital; please refer to local Trust's procedural documents for further guidance, as noted in Section 4.

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2. Consider: Haloperidol 0.5-2mg IM/IV (adults only)
Midazolam 2mg IV 30 mins before the end of anaesthesia
P6 Acupressure point stimulation
Cyclizine 50mg slow IV or IM. Only if all other options not available.

*Do not repeat antiemetic drug within 6 hours, do not repeat Dexamethasone at all.

Risk Assessment

Reduce base line risks

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Management of risk groups

* The use of both Ondansetron 0.15mg/kg and Dexamethasone 0.15mg/kg IV should be considered in patients having adenotonsillectomy or strabismus surgery.[4] Cyclizine 1mg/kg slow IV can be used if other alternatives exhausted or inappropriate.

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1. Introduction

The incidence of Post operative Nausea and Vomiting (PONV) -, after a general anaesthetic using inhalational agents and opioids without prophylactic anti-emetics, is around 30%[1]. Some patients have a higher risk of developing PONV and scoring systems have been developed to estimate the risk. Once PONV has developed, a sub-group of patients will suffer 'clinically important' PONV with significantly impaired recovery, which in day surgery patients may require admission.

1.1. Rationale

It has been demonstrated that targeted administration of PONV prophylaxis to those with increased risk of PONV reduces its incidence. Moderate to high risk patients for PONV are targeted for prophylactic anti-emetics, with the largest number of agents given to those at highest risk. PONV is multifactorial in origin. A multimodal approach that includes pharmacological and non-pharmacological interventions has been found to be effective.[1]

1.2. Objective

The objective of the clinical guideline is to:

- Optimise assessment of risk of PONV in both adults and children
- Optimise management of PONV in both adults and children
- Reduce the PONV in all surgical patients and in day patients reduce day case admission rates due to unmanageable PONV

1.3. Scope

These clinical guidelines support all anaesthetists delivering anaesthetics to all patients of any age undergoing surgery in any area for the Norfolk and Norfolk Hospital.

1.4. Glossary

The following terms and abbreviations have been used within this document:

Term	Definition
PONV	Post operative Nausea and Vomiting
POV	Post operative Vomiting
IV	Intravenous
IM	Intramuscular
PO	Orally
bd	Twice a day
PCA	Patient Controlled Analgesia

2. Responsibilities

2.1. Author

The Author will ensure the document is up to date with the most recent evidence for the management of PONV

2.2. Staff

All Anaesthetists, Anaesthesia Associates and Recovery Staff will ensure they are up to date with any changes to the clinical guideline.

3. Processes to be followed

3.1. Management of PONV in adults

3.1.1. Assessment of risk

Assessment of risk of post-operative nausea and vomiting must be considered at the time of pre-operative assessment. Risk factors should be identified and recorded. It would be useful if the patient's risk was scored using a scoring system (see below – Apfel risk score), also taking into account the type of surgery and anaesthetic.

Risk factor with positive evidence for PONV in adults

- Female sex
- History of PONV or motion sickness
- Non smoking
- Younger age (<50years)
- General versus regional anaesthesia
- Use of volatile anaesthetics
- Postoperative opioids but not intraoperative opioids
- Duration of anaesthesia
- There is some evidence that pregnant woman having non-obstetric surgery have a higher risk of PONV[7]

†Type of surgery (cholecystectomy, laparoscopic, gynaecological)

Simple risk scores are available and have been validated.

Apfel risk score for PONV in adults

Risk factor	Score
Female	1
Non smoker	1
History of PONV or travel sickness	1
Post-operative opioids	1
Total score	0-4

Points scored	% risk of PONV	Level of risk
0	10	Low
1	20	
2	40	Medium
3	60	
4	80	High

3.1.2. Reduction of baseline risks

Strategies recommended to reduce baseline risk include:

1. The avoidance of general anaesthesia by the use of regional anaesthesia;
2. Preferential use of propofol infusions;
3. Avoidance of volatile anaesthetics;
4. Minimization of perioperative opioids;
5. Adequate hydration.

3.1.3. Prophylactic antiemetic administration for adult patients with 1-2 risk factors for PONV

For patients with 1-2 risk factors for PONV (medium risk) one should consider the use of 1 to 2 interventions. These interventions could be the use of up to two antiemetics or one antiemetics with the use of a propofol based anaesthetic.

Antiemetic drugs suitable for use are:

Drug	Adult Dose	Route	Timing of administration	Notes
Ondansetron	4mg	IV	At the end of the procedure	Side effects include headache, constipation Avoid in congenital prolonged QT syndrome. In pregnant women before 12 weeks gestation a single dose on ondansetron in pregnant women is low risk, avoid prolonged courses.[7]
Dexamethasone	3.3-6.6mg	IV	At induction of anaesthesia	See note below*
Haloperidol	0.5-2mg (Adults)	IV/IM	At any time	Avoid in Parkinson's disease. Needs ECG monitoring if given IV- prolonged QT
Midazolam	2mg (Adults)	IV	30mins before end of procedure	See reference 9. Care in the elderly, risk of delirium, reduce dose.
Cyclizine	50mg (1mg/kg)	Slow IV		First line drug of choice in pregnancy.

				Avoid in severe heart failure, porphyria.
Prochlorperazine	12.5mg (Adults)	IM		Avoid in Parkinson's disease. Extrapyramidal side effects - dystonic reaction. Dose reduction in elderly patients due to increased susceptibility to hypotension and neuromuscular reactions. Short term use in lactating women only.[8]
Prochlorperazine	3-6mg (Adults)	Buccal		

There is evidence that stimulation of the P6 acupuncture point has a similar efficacy to that of prophylactic antiemetics such as ondansetron, droperidol, metoclopramide, cyclizine, and prochlorperazine[7]. This is found on the inner wrist, 3 finger breadths below the wrist joint. Pressure is applied to the point between the 2 tendons for about 30 seconds at a time.

First line intervention should be ondansetron and second line intervention should be one of the other drugs above.

*Dexamethasone is shown to be efficacious as an antiemetic with a risk ratio of 0.48 for reduction of PONV and this improves with addition of another antiemetic. Advantages of dexamethasone include reduction of post-operative swelling in dental and head and neck procedures, improved analgesic effect especially in laparoscopic cholecystectomy, and quicker attainment of discharge criteria in day surgery patients. This needs to be balanced against the disadvantages including impairment of glucose homeostasis especially in obese and diabetic patients, neuropsychiatric effects, post-operative infections especially in the immunocompromised.[5,6]

3.1.4. Intraoperative management of adult patients with high risk of PONV

It has been shown that there can be an 80% complete response rate with a multimodal approach to minimize the risk of PONV. This means that 20% of patient may still experience PONV no matter what measures are taken and high-risk patients should be counselled about this. Management of this group should include preoperative anxiolysis (midazolam), prophylactic antiemetics, total intravenous anaesthesia (TIVA) with propofol, and local anaesthetic infiltration and avoidance of opioids[1] if possible.

3.1.5. Management of established PONV in adults.

Patients should be repeatedly assessed for PONV in recovery and treatment should be prompt when symptoms are first elicited.

Consideration should be given to other causes of nausea and vomiting such as:

- Blood in throat
- Hypotension, hypovolaemia
- Abdominal obstruction
- PCA opioids
- Temperature – Sepsis, or hypothermia

First line treatment should be ondansetron IV 4mg **if this has not been given in the preceding 6 hours**. Consider an antiemetic from a different class of drug used as prophylaxis e.g. Prochlorperazine 12.5mg IM (avoid in Parkinson's' disease)

Other options could include low dose propofol boluses (20mg) but this is short lived with risk of airway compromise.

3.1.6. Postoperative ward prescriptions

All patients must have antiemetics prescribed for when they return to the ward. These can include:

- Ondansetron 4mg IV/IM/PO 8 hourly.
- Prochlorperazine 12.5mg IM once followed by:
- Prochlorperazine 3-6mg buccal bd.

3.2. Management of POV risk in children

3.2.1. Assessment of risk

Children and young people are generally at higher risk of developing POV than are adults. Risk factors include:

Patient factors:

- Age greater than 3 years, POV risk rises into adolescence.
- Previous history of motion sickness.
- Previous history of POV.
- Some evidence of high risk for post pubertal girls.

Surgical factors:

- High risk with strabismus surgery.*
- High risk with tonsillectomy +/- Adenoidectomy.*
- Surgical procedures > 30 mins.

Anaesthetic factors:

- Volatile anaesthetics.
- Opioids especially if long acting post-operatively.
- Mandating post-operative fluids may increase risk of POV.
- Intraoperative fluids may reduce risk.
- Anticholinesterases may increase the risk.

Nitrous Oxide is NOT associated with high risk of POV in children.

Risk score for POV in children[1]

Risk factor	Score
Surgery >/= 30mins	1
Age >/= 3 years	1
High risk surgery*	1
History of POV or PONV in relative	1
Total	0-4

Points scored	% risk of PONV[1]	Level of risk
0	10	Low
1	10	
2	30	Medium
3	50	High
4	70	

3.2.2. Management of POV risk

- All children at risk of POV should be given ondansetron IV 0.15mg/kg prophylactically.
- All children at **high** risk of POV should be given ondansetron IV 0.15mg/kg and dexamethasone 0.15mg/kg. **Consider this in children having strabismus surgery or adenotonsillectomy.**
- Consider using intravenous anaesthesia and non-opioid analgesia for children at high risk of POV.

3.2.3. Management of established POV in children

In children established POV should be treated initially with IV ondansetron 0.15mg/kg if they have not received it prophylactically, otherwise an antiemetic from another class such as IV dexamethasone 0.15mg/kg slowly.

Do not repeat dexamethasone in adults or children.

3.2.4. Postoperative ward prescription

All patients need antiemetics prescribe for their return to the ward. Please consider:

- Ondansetron 0.1mg/kg IV,
- followed by cyclizine 1mg/kg slow IV.

4. Related Documents

- Microsoft Word - 2016 APA POV Guideline-2.docx (apagbi.org.uk)
- A Clinical Guideline for the Anaesthetic and Peri-operative Management of Pregnant Patients for Non-obstetric Surgery. (Trust document: ID 19327)

5. References

a) Gan, Tong J. MD, MBA, MHS, FRCA*; et al Fourth Consensus Guidelines for the Management of Postoperative Nausea and Vomiting. Anesthesia & Analgesia 131(2):p 411-448, August 2020. | DOI: 10.1213/ANE.0000000000004833 The Association of Paediatric Anaesthetists of Great Britain & Ireland. Guidelines on the Prevention of

Post-operative Vomiting in Children. Published Spring 2009.

b) Royal College of Anaesthetists Raising the Standard: a compendium of audit recipes 3rd Edition 2012. Chapter 3.5 Post-operative nausea and vomiting (PONV) Dr A Kumar, Dr W Brampton p 120-121

c) http://www.apagbi.org.uk/sites/default/files/APA_Guidelines_on_the_Prevention_of_Postoperative_Vomiting_in_Children.pdf

d) Kakodkar P.S. Editorial: Routine use of dexamethasone for postoperative nausea and vomiting: the case for. Anaesthesia 2013, 68, 889–898

e) Lee A., Fan LT. Stimulation of the wrist acupuncture point P^ for preventing postoperative nausea and vomiting. Cochrane database Syst rev. 2009 Apr 15;(2):CD003281

f) Kim J-H, Kim N, Lee S-K, Kwon Y-S. Effect of Pregnancy on Postoperative Nausea and Vomiting in Female Patients Who Underwent Non delivery Surgery: Multicenter Retrospective Cohort Study. *International Journal of Environmental Research and Public Health*. 2022; 19(22):15132

g) Jan-2020-PDF-final.pdf (publishing.service.gov.uk) MRHA drug safety update, accessed 19th October 2023

h) Drugs and Lactation Database (LactMed®) [Internet]. Bethesda (MD): National Institute of Child Health and Human Development; 2006-. Ondansetron. [Updated 2022 May 15]. Available from: https://www.ncbi.nlm.nih.gov/books/NBK500798/

i) https://bnf.nice.org.uk/

6. Audit of the process

Compliance with the process will be monitored through the following:

Key elements	Process for Monitoring	By Whom (Individual / group /committee)	Responsible Governance Committee /dept	Frequency of monitoring
Assessment of risk of PONV and POV	Audit of Anaesthetic charts	Helen Goddard	Anaesthetic department	Annual
Assessment of PONV and POV rates in the PACU	Review of PACU audit data	Helen Goddard	Anaesthetic department	Annual
Compliance with guideline.	Audit of Anaesthetic charts and EPMA.	Helen Goddard	Anaesthetic department	Annual

The audit results are to be discussed at relevant governance meetings to review the results and recommendations for further action. Then sent to Anaesthetic governance leads who will ensure that the actions and recommendations are suitable and sufficient.

7. Appendices

There are no appendices for this document.

8. Equality Impact Assessment (EIA)

Type of function or policy	Existing

Division	2	**Department**	Anaesthesia
Name of person completing form	Dr Helen Goddard	**Date**	10/08/2023

Equality Area	Potential Negative Impact	Impact Positive Impact	Which groups are affected?	Full Impact Assessment Required YES/NO
Race	No	No	Nil	No
Pregnancy & Maternity	No	Yes	Non-obstetric surgery patients	No
Disability	No	No	No	No
Religion and beliefs	No	No	No	No
Sex	No	Yes	Female patients have higher risk of PONV	No
Gender reassignment	No	Yes	Consider higher risk in patient with female birth gender.	No
Sexual Orientation	No	Yes	Consider higher risk in patient with female birth gender.	No
Age	No	Yes	Higher risk in younger women under the age of 50 years	No
Marriage & Civil Partnership	No	No	No	No
EDS2 – How does this change impact the Equality and Diversity Strategic plan (contact HR or see EDS2 plan)?				

- **A full assessment will only be required if: The impact is potentially discriminatory under the general equality duty.**
- **Any groups of patients/staff/visitors or communities could be potentially disadvantaged by the policy or function/service.**
- **The policy or function/service is assessed to be of high significance**

IF IN DOUBT A FULL IMPACT ASSESSMENT FORM IS REQUIRED

The review of the existing policy re-affirms the rights of all groups and clarifies the individual, managerial and organisational responsibilities in line with statutory and best practice guidance.