

Assessing and managing nausea and vomiting in adults: At a glance

This article will:

- Define nausea, retching and vomiting and outline common causes of these symptoms
- Provide an introduction to the anatomy and physiology associated with nausea and vomiting
- Provide awareness of how nausea and vomiting can impact on an individual's life and what complications and dangers are associated with vomiting
- Discuss how nausea and vomiting can be holistically assessed and managed
- Outline the uses, actions and side effects of antiemetic medications

Introduction

Nausea and vomiting are unpleasant and potentially distressing symptoms that are commonly experienced by patients, especially for individuals on the perioperative care continuum, during pregnancy and childbirth and by patients in the advanced stages of a disease or at the end of life (Kelly and Ward, 2013; Dye, 2017; Leach, 2019). Nausea and vomiting can also be a sign of more serious impairment, emotional distress or an adverse reaction to therapeutic treatments (Keeley, 2019). The potential impact of nausea and vomiting on the individuals' wellbeing and quality of life can vary depending on the length and severity of the specific episodes, but in some cases can be so severe individuals may decide to stop treatment (Brooker and Waugh, 2013; Kelly and Ward, 2013). Prolonged nausea and vomiting can also result in physiological complications, psychological changes and social difficulties that could have short or long term impacts on health, with the most frequent and severe including dehydration, nutritional deficiencies and electrolyte and acid-base imbalance (see figure 1) (Brooker and Waugh, 2013; Patton and Thibodeau, 2018).

Terminology

An understanding of medical terminologies associated with nausea and vomiting is important for reliable and effective assessment and management of patients' symptoms (*see figure 2*) (Waugh and Grant, 2018). However, whilst this is vital when working collaboratively with other healthcare professionals, it also beneficial when communicating with patients, to have an awareness of some of the colloquial language that might be used to describe how they are feeling i.e. 'barf' and 'hurl' to accurately interpret their symptoms.

Anatomy and physiology

The act of emesis is associated with the initiation of the vomiting centre of the brain (Dougherty and Lister, 2015). This can be activated by receptors (i.e. histamines, acetylcholine, dopamine and 5-hydroxytryptamine) in the gastrointestinal tract, cerebral cortex, vestibular apparatus and chemoreceptor trigger zone, which respond to stimuli such as drugs and toxins, pain and fear, or movement and injury (Brookers and Waugh, 2013) (*see figure 3 and figure 4*). In some cases, the aetiology may be multifactorial i.e. chemotherapy treatment, memory and anxiety and thus a multimodal management approach may be required (Collis, 2015). Keeley 2019 holistic approach, through clinical assessment, knowledge of receptors and targeted management strategies, what is likely mechanism, what receptors are involved, how impacting on life, what is makes it worse or better and in the case vomiting a visual assessment of the vomit is required which will include volume – fluid loss

Physical examination – dehydration, abdominal, rectal, oral, vital observations

Assessment strategies

Before nausea and vomiting can be treated or the cause reversed, there needs to be a comprehensive assessment of a patient's symptoms and specific clinical features must be examined to find which

branch of the emetic pathway has triggered the physiological response (Collis, 2015; Leach, 2019). Assessments can be undertaken in a preventative capacity, whereby the risk of developing nausea and vomiting are examined and calculated in order to prophylactically manage anticipatory nausea and vomiting, but also to find the cause if vomiting has already occurred (Dougherty and Lister, 2015). A variety of assessment tools are available to assess patients with emetic symptoms. The severity (or intensity) of nausea an individual is experiencing is particularly difficult to assess. Several different scales are available to help people express the severity or intensity of their nausea (or other emetic symptoms). These include: Numerical rating scales (i.e. often incorporated in analgesia infusion charts, regional anaesthetic Verbal rating scales More detailed assessment tools, e.g. nausea, retching and vomiting questionnaires, may be used to obtain more in depth insight into the person's emetic symptoms and their impact on the individual.

Ask questions to determine, what makes it worse, what makes it better, when started, do you feel hungry, does eating help (Dye, 2017).

As well as assessment tools that are used to assess nausea and vomiting, there are also at-risk assessment tools to help predict whether an individual is likely to develop emetic symptoms. These may be used before treatments such as surgery and chemotherapy to help doctors decide whether antiemetics should be administered prophylactically to try and prevent emetic symptoms in an individual. Examples of factors which might be taken into account in these at-risk assessments include history of motion sickness, history of previous post-operative or chemotherapy-induced nausea and vomiting, gender, whether the person is a smoker, type and length of the planned surgical procedure and the anaesthetic or other medications, e.g. opioids, due to be used. Postoperative N&V assessment tools. Nausea and vomiting can be a postoperative complication due to the anaesthetic agents, the

analgesia, gastric changed following surgery and as some people are also more prone, gynaecology, elderly, very young and old, history of PONV and motion sickness excessively starved and smoking patients (Phillips and Perriman, 2017). Smith 2015 gnauem isitory, non smoket, age, opioids, female, laroscopis, PONV assessment undertaken. Score an individual based on gender, age, motion sickness, smoker, surgery, gynaecology procedures are more emetogenic, length of surgery, tyle of anaesthetic and analgesic agents begun used (Dogherty and Lister, 2015).

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Characteristics of nausea, retching and vomiting:

Vomiting:

- duration
- frequency
- volume
- nature of vomiting, e.g. projectile
- nature of vomit, e.g. undigested food, faecal fluid
- colour, e.g. bile-stained
- presence of blood (haematemesis): coffee grounds or frank bleeding
- aroma, e.g. solvent

Factors that precipitate, increase or reduce nausea, retching and vomiting: movement, food/fluids, hunger, aromas

Impact of emetic symptoms on the individual: - physical

- psychological

- social

Strategies used previously to manage nausea, retching and vomiting and their effectiveness:

Management strategies

Effective management of nausea and vomiting not only influences a patient's symptom response it also improves patient compliance with therapeutic treatments. However, as there are a vast array of management strategies that can be employed it is essential that health care professionals are dependent on the patient, the quality of the assessment and the resources available, with strategies including both pharmacological and non-pharmacological approaches (Dougherty & Lister 2015; Dye, 2017).

Pharmacological management

The administration of medications is the most common intervention used in today's healthcare system, with its ability to provide safe and effective means to managing many diseases and their signs and symptoms (Deslanders, Pitcher & Young, 2019). The types of drugs prescribed to patients for nausea and vomiting are called antiemetics (anti-sickness), as discussed nausea and vomiting have many causes, therefore the type of antiemetic prescribed will depend on the cause of a patient's nausea and

vomiting (Neal, 2012). Central or peripheral effect one or more neuroreceptor (Doherty and Lister, 2015).

Due to antiemetics vary in their mechanism(s) of action, an antiemetic medication that is effective in the management of chemotherapy-induced nausea and vomiting, for instance, may have no role in the prevention and treatment of emetic symptoms due to other causes, e.g. motion sickness (Neal, 2012). Thus the British National Formulary (2020) recommends that antiemetic medication should only be prescribed when the cause of nausea and vomiting are known.

Sometimes people require two or more antiemetics to achieve symptom control Dye , 2017 . A number of the antiemetic medication outlined above can be administered via multiple routes including IV, IM, sub cut, oral, and suppository. It is important that clinical judgement is made when considering the most appropriate route of administration for your patient, this can be determined during the assessment process.

Ineffective is often when range of antiemetics given by same mechanism of action (Leach, 2019).

Non-pharmacological

As pharmacological management is only partially effective and can also cause some side effects, alternative strategies may also need to be employed (Lee and Fan, 2011).

Acupressure

Acupressure is a variation of acupuncture which is based on more than 3,000 years of traditional Chinese medicine (Hofmann et al., 2017). Acupressure is a non-invasive therapeutic method, which involved applying physical gentle pressure to certain acupuncture points (acupoints) by finger, elbow, hand or with various devices (Yang, 2019). Globally, acupressure for managing nausea and vomiting has become a popular alternative therapy for reducing nausea and vomiting during chemotherapy, pregnancy and post-surgery (Byju, Pavithran & Antony, 2018; Yang, 2019).

Although antiemetics are used worldwide to manage nausea and vomiting, a number of patients using antiemetics can still experience signs and symptoms. In addition some patients are reluctant to take antiemetic drugs as they can cause them to experience side effects like sedation, headache, constipation, and fatigue (Yang, 2019).

Acupoints are located at specific places on imaginary lines called meridians throughout the human body (Byju, Pavithran & Antony, 2018). In particular acupressure of the P6 point, which lies 4cm proximal (three fingers) to the wrist crease of the dominant arm has proven helpful to some patients in controlling nausea and vomiting, with, minimal side effects (Lee & Fan, 2011). “P6 lies between tendons of palmaris anlongus abd flexor caepi radialis musckes, 4cm proximal to wrist crease ((Yang, 1993

From the Eastern perspective, acupressure is believed to stimulate or interrupt energy, thereby altering responses to negative stimuli i.e. nausea and vomiting, whereas in western medicine the focus of acupressure is on the triggered release of endogenous endorphins (Hofmann *et al.*, 2017).

(see figure 5)Insert picture of P6 point

Ginger

Ginger is a herb belonging to the Zingiberaceae family (Lete & Allue, 2016). Its use as an adjuvant therapy or as a complementary natural alternative for alleviating symptoms of nausea and vomiting (Tóth *et al.*, 2018) has been researched extensively within pregnancy, chemotherapy, Postoperative nausea and motion sickness (Stanisiere, Mousset and Lafay, 2018). Ginger has become popular, with study’s concluding that it can be just as effective as pharmacological therapies and with fewer side effects (Lete & Allue, 2016). Gingers works by blocking the actions of serotonin (can simulate the vomiting reflex) and Acetylcholine (triggers involuntary stomach contractions) in the body (Lete & Allue, 2016; Stanisiere, Mousset and Lafay, 2018).

Nursing care for patient experiencing nausea and vomiting

<p><u>Mouth care</u></p>	<p>Assisting patients with or ensuring patient have access to equipment to perform oral hygiene is important for ensuring the structures and tissues of the mouth remain healthy (Burns, Cole & Stamford, 2019). Bile and acids from your stomach can cause damage to your teeth, gums, and throat in addition it can cause the skin around the mouth to break down.</p> <p>Taste from vomiting or from certain food can make patients feel more nauseous, removing the taste through oral hygiene can therefore help in reducing nausea (Nicol <i>et al.</i>, 2012).</p>
<p><u>Privacy and dignity</u></p>	<p>Close curtain to provide privacy, promote comfort keep clothes clean, ensure tissues, and vomit bowls are easily accessible (Nicol <i>et al.</i>, 2012)</p>
<p><u>Fluid balance</u></p>	<p>Vomiting and nausea can change a patients hydration status, with the patients being at risk of dehydration, which occurs when your body has a deficit in the volume of fluid that it needs to function properly. Severe dehydration can cause your kidneys to shut down. It is therefore important to keep an accurate fluid balance (Daughtery & Lister, 2015).</p>
<p><u>Environment</u></p>	<p><u>Reduce smells</u> Move patients during meal times, open windows if able to. Avoid foods that have strong odors. Eat foods that are cool or can be eaten at room temperature as this will decrease the smell of these foods. Fresh cool air can help alleviate symptoms of nausea</p>
<p><u>Diet and nutrition</u></p>	<p>Nausea and vomiting can lead a reduction in appetite and/or cause a patient to stop eating. Keep a diet food chart so that intake can be monitored. Encourage patients to eat small, frequent meals. This may mean eating small amounts of food every 2-3 hours. Choose bland, non-spicy, non-fatty foods. Avoid foods that have caused nausea in the past for patients.</p>

Conclusion

Pirri et al 2013 imperative that HCP undertake a multiple approach to assessment and management of nausea and all its associated symptoms, and prevent, treat and manage using pharmacological as well as non pharmacological treatment. They will only be able to achieve this by working in partnership with the patient and ensuring that use evidence based approaches to assessment, risk identification and management strategies. +

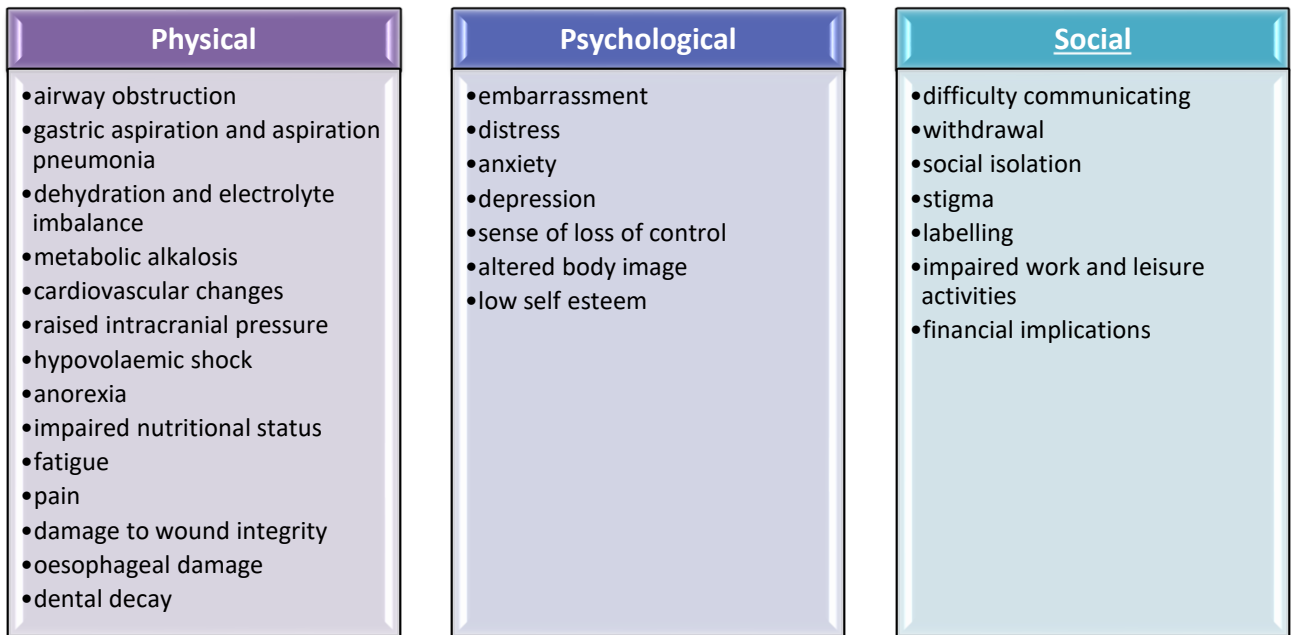
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Figure 1: The potential impact on nausea and vomiting on the individual



(Brooker and Waugh, 2013; Patton and Thibodeau, 2018).

Figure 2: Medical terminology associated with nausea and vomiting

Nausea	<ul style="list-style-type: none">• Subjective experience of feeling sick• Unpleasant feeling often leading to vomiting• Commonly associated with symptoms of hypersalivation and tachycardia
Retching	<ul style="list-style-type: none">• Movements associated with vomiting without the expulsion of gastrointestinal contents• Often begins with deep inspiration
Emesis	<ul style="list-style-type: none">• Vomiting
Vomiting	<ul style="list-style-type: none">• The forceful emptying of stomach contents through the mouth• Usually associated with nausea and follows retching
Emetic symptoms	<ul style="list-style-type: none">• Nausea, retching and vomiting
Emetogenic potential	<ul style="list-style-type: none">• Ability of a treatment, e.g. chemotherapy, to cause nausea, retching and vomiting
Antiemetics	<ul style="list-style-type: none">• Medication used to treat nausea, retching and vomiting
Projectile vomiting	<ul style="list-style-type: none">• Spontaneous vomiting not preceded by nausea or retching• Normally associated with direct neurological stimulation of the vomiting centre of the brain i.e. brain tumour or gastrointestinal obstruction (pyloric stenosis)
Chemotherapy-induced nausea and vomiting	<ul style="list-style-type: none">• Acute nausea and vomiting (starting soon after the chemotherapy is given)• Delayed nausea and vomiting (starting more than 24 hours after treatment)
Anticipatory nausea and vomiting	<ul style="list-style-type: none">• Unusual condition, where a person undergoing chemotherapy has emetic symptoms to a conditioned stimulus before treatment is commenced e.g. the chemotherapy nurse's perfume.

(Roscoe, *et al.* 2011; Vidall, 2014; Dudley-Brown and Huether, 2013; Patton and Thibodeau, 2018;

Waugh and Grant, 2018)

Figure 3: The emetic pathway

PLEASE INSERT PICTURE OF EMETIC PATHWAY

Figure 4: Examples of stimuli and receptors

Vestibular system	Chemoreceptor trigger zone	Gastrointestinal tract	Cerebral cortex
<ul style="list-style-type: none">• Motion sickness• Base of skull tumours• Histamine type 1• Acetylcholine	<ul style="list-style-type: none">• Chemical disturbances• Opioids• Chemotherapy• Radiotherapy• Anaesthetic agents and surgery• Dopamine type 2• Serotonin type 3• Neurokinin 1	<ul style="list-style-type: none">• Gastric stasis• Tactile stimuli• Intramuscular tension• Constipation• Handling of the viscera during surgery or accumulation of gas• Intestinal obstruction• Serotonin type 3 and 4• Dopamine type 2• Acetylcholine	<ul style="list-style-type: none">• Pain• Fear• Anxiety• Raised intracranial pressure• Unpleasant sights and odours• GABA• Histamine type 1

(Collis, 2015;

Figure 5: Pressure point – P6

PLEASE INSERT IMAGE OR PICTURE OF PRESSURE POINT P6

Figure 6: Types of antiemetics and uses

<u>Types of antiemetics and examples of medications</u>	<u>Uses</u>
<p>Antihistamines</p> <ul style="list-style-type: none"> • cinnarizine • cyclizine • promethazine 	<p>Wide variety of uses, including motion sickness and vertigo.</p>
<p>Phenothiazines and related drugs</p> <ul style="list-style-type: none"> • perphenazine • prochlorperazine • trifluoperazine • chlorpromazine • levomepromazine • droperidol • haloperidol 	<p>Phenothiazines are dopamine antagonists and act centrally by blocking the chemoreceptor trigger zone.</p> <p>Perphenazine, prochlorperazine and trifluoperazine are used in severe nausea and vomiting due to a variety of causes. Droperidol is used to prevent or treat nausea and vomiting following surgery. Haloperidol and levomepromazine are used in palliative care, and chlorpromazine is often prescribed as a last resort for patients who have a terminal illness.</p>
<p>Domperidone and metoclopramide</p>	<p>Metoclopramide hydrochloride is used to prevent postoperative nausea and vomiting and treat a variety of nausea and vomiting causes such as migraine and radiotherapy. It acts directly on the gastrointestinal tract, thus may be more beneficial than phenothiazine for nausea and vomiting associated with gastroduodenal, hepatic and biliary disease. Domperidone is used to treat emetic symptoms, with it acting at the chemoreceptor trigger zone. It has the advantage in being less likely to cause drowsiness and dystonic reactions because it does not readily cross the blood-brain barrier.</p>
<p>5HT₃-receptor antagonists</p> <ul style="list-style-type: none"> • granisetron • ondansetron • palonosetron 	<p>Therapy to prevent postoperative nausea and vomiting include 5HT₃-receptor antagonists. A combination of these medications can be used with choice based on the assessed risk of postoperative nausea and vomiting in each patient. 5HT₃-receptor antagonists are often used with Dexamethasone.</p>
<p>Neurokinin 1-receptor antagonists</p> <ul style="list-style-type: none"> • aprepitant • fosaprepitant 	<p>Administered alongside 5HT₃-receptor antagonist to prevent chemotherapy induced nausea and vomiting.</p>
<p>Nabilone</p>	<p>Nabilone is a synthetic cannabinoid which can be considered as an add on for treating nausea and vomiting. Cannabinoids are used as a last resort when other antiemetics have failed to control nausea and vomiting due to chemotherapy.</p>
<p>Hyoscine</p>	<p>Hyoscine should be given to prevent motion sickness and should therefore be administered before vomiting has started.</p>
<p>Dexamethasone</p>	<p>A steroid, used to manage nausea and vomiting during chemotherapy.</p>

(BNF, 2020)

Nurse in a safe position to protect the airway and remove dentures	Assist with mouth care and personal hygiene (change of clothes etc.)	Use appropriate infection control measures
Maintain adequate ventilation and comfortable environmental temperature	Observe for signs of dehydration	Restrict or provide oral fluids and diet as instructed
Maintain an accurate fluid balance chart - measure and assess vomit	Administer antiemetics as prescribed, evaluate effectiveness and monitor for side effects	Provide vomit bowls and tissues and replace promptly when used
Consider use of other strategies, e.g. acupressure, ginger, aromatherapy.	Referral to another professional may be required e.g. clinical psychologist	Administer intravenous fluid and electrolytes as prescribed
Provide psychological support and education for the patient and family	Insert a nasogastric tube, if instructed	Identify any other strategies the patient finds helpful
Monitor observations, inform the doctor and request a review, as appropriate	Maintain privacy and dignity and provide physical comfort - hold vomit bowl and wipe mouth	Assit with the avoidance of food smells and strong odours

Brooker and Waugh, 2013; Dye, 2017).