Anti-emetic guidelines for the prophylaxis of Chemotherapy and Radiotherapy induced nausea and vomiting in ADULTS (for use by Haematologists and Oncologists)

Introduction

Chemotherapy Induced Nausea and Vomiting (CINV) is one of the most frequently experienced side effects encountered by chemotherapy patients. Patients will often find the symptoms distressing, and develop anxiety about the potential for such symptoms to recur on future cycles of chemotherapy. Modern drug treatment can successfully control CINV for the majority of patients.[1]

Scope

The purpose of this document is to provide guidance on the rationale use of anti-emetics for prevention and treatment of chemotherapy and radiotherapy induced nausea and vomiting in adult patients. They are not intended to address nausea and vomiting in palliative care. These guidelines are intended to provide a framework to support clinical practice, they cannot cover every clinical situation and good common clinical sense and clinical experience will be required when approaching the management of individual patients.

It should be noted that the definitions for low, moderate, high and very high are in line with ASCO, MASCC and NCCN definitions. The definition of "moderate" in these sources is 30-90% which will encompass most of the chemotherapy drugs/regimens. This has been sub-categorised as low-moderate and high moderate to assist when choosing appropriate treatment for anti-emetic failure. [1]

Definitions[1,2,3,4]

Acute	N&V experienced during the first 24-hour period immediately after chemotherapy administration.
Delayed	N&V that occurs more than 24 hours after chemotherapy and may continue for up to 6 or 7 days after chemotherapy.
Anticipatory	N&V that occurs prior to the beginning of a new cycle of chemotherapy. It is either a learned response following chemotherapy induced N&V on a previous cycle or an anxiety response. It is most common after 3 to 4 cycles of chemotherapy with very badly controlled acute or delayed symptoms.
Breakthrough	Development of symptoms (nausea or vomiting), despite standard anti-emetic therapy, which require treatment with an additional pharmacological agent.
Refractory	Patients who have failed on both standard and rescue medication.

Grading of Nausea and Vomiting[1,5]

	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
Nausea	Loss of appetite without alteration in eating habits	Oral intake decreased without significant weight loss, dehydration or malnutrition; IV fluids indicated <24h	Inadequate oral caloric or fluid intake; IV fluids, tube feedings, or TPN indicated ≥24h	Life-threatening consequences	Death
Vomiting	1 episode in 24h	2–5 episodes in 24h; IV fluids indicated <24h	≥6 episodes in 24h; IV fluids, or TPN indicated ≥24h	Life-threatening consequences	Death

Other causes of nausea and vomiting to be considered:

Radiotherapy, radiosensitizers, infection, metabolic disorders, electrolyte disturbances (hypercalcaemia, hyperglycaemia, hyponatraemia), uraemia, constipation, gastrointestinal obstruction, gastroparesis induced by a tumour or chemotherapy (e.g. vincristine), cachexia syndrome, metastases (brain, liver, bone), paraneoplasia, other emetogenic medication (e.g. opioids, antibiotics, antifungals, amifostine), psychophysiologic factors including anxiety and anticipatory nausea and vomiting, vestibular dysfunction.

Patient Risk Factors which predict poor control of nausea and vomiting

Patients with 3 or more risk factors should be considered to receive additional anti-emetics at the outset:
Female sex
<30 years old
History of sickness: in pregnancy / travel sickness/ with surgery
Poor control with prior chemotherapy
Underlying nausea and vomiting
Anxiety
N.B. Previous high alcohol intake can have a protective effect and reduce risk of emesis

Guidance

Antiemetic recommendations for Chemotherapy and Radiotherapy[1,2,3,4]

- Always commence anti-emetics before chemotherapy and radiotherapy.
- Anti-emetics should be administered regularly, prophylactically, and orally during chemotherapy administration and for at least 3 days after cessation of chemotherapy for highly and moderately emetic chemotherapy. Patients must be protected throughout the full period of risk.
- Oral and IV formulations of anti-emetics are equally effective.
- Give oral doses at least 30 minutes before chemotherapy is initiated.
- Optimal emetic control in the acute phase is essential to prevent nausea and vomiting in the delayed phase and to prevent anticipatory nausea and vomiting.
- Dexamethasone should be given prophylactically where indicated.
- Dexamethasone should be given no later than 2pm to minimise wakefulness in the night. Patients should be informed of the adverse effect when scheduled to receive IV doses after 2pm, for example should their chemotherapy be initiated later in the day.
- 5HT-3 receptor antagonists are equally efficacious and should be administered orally, and only in the acute setting (i.e. only administer on days of chemotherapy administration). There is only evidence for the use of 5HT-3 receptor antagonists for one additional day in the delayed phase for cyclophosphamide and carboplatin.
- 5HT-3 receptor antagonists can be administered i.v. instead of orally if necessary.
- The toxicity of the specific anti-emetic(s) should be considered.
- Anti-emetics should be chosen based on the emetogenic potential of the chemotherapy regimen, previous patient experience with anti-emetics, and patient-specific risk factors.
- Dexamethasone is not required when steroids are included in a chemotherapy regimen, nor for most haematology regimens (refer to specific haematology protocols).
- Metoclopramide can be replaced with eg cyclizine or prochlorperazine if patient is already on regular anti-emetics.
- For patients < 30 years old or if patient experiences extrapyramidal side effects, consider domperidone instead of metoclopramide or prochlorperazine.
- Fosaprepitant is an intravenous preparation of aprepitant that can be substituted for aprepitant in patients unable to tolerate oral medication. Fosaprepitant is administered in a dose of 150mg IV over 20-30 minutes (see SPC available at www.medicines.org.uk).
- If lorazepam is prescribed, ensure patients are warned not to drive or drink alcohol due to high risk of drowsiness.
- Domperidone may be associated with an increased risk of serious ventricular arrhythmias or sudden cardiac death[6]. The risk may be higher in patients older than 60 years and at daily doses of more than 30mg[6]. Domperidone should be avoided in patients taking concomitant medication known to cause QT prolongation[6]. Domperidone should therefore be used at a maximum dose of 10mg tds orally. As per the MHRA recommendation, the lowest effective dose should be used for the shortest possible time[6]. Alternative anti-emetics should be considered in patients with severe hepatic impairment, cardiac conduction conditions or underlying cardiac disease, or receiving other medications known to prolong QT or potent CYP3A4 inhibitors[6]. The MHRA recommendations state that the maximum treatment duration should not *usually* exceed one week[6]. Refer to SPC for further information (www.medicines.org.uk) .
- Metoclopramide should be prescribed at the lowest effective dose. Doses above 10mg tds increase the risk of extrapyramidal side effects and should be used with caution in line with MHRA guidance[7]. For the prophylaxis of chemotherapy induced nausea and vomiting, the network have agreed to continue to use doses of up to 20mg tds.
- Ondansetron may increase the risk of QT prolongation, leading to an abnormal and potentially fatal heart rhythm. Patients at particular risk include those with an underlying heart condition, those predisposed to low serum potassium and magnesium levels, and those taking other medications that lead to QT prolongation. Ondansetron should be avoided in patient with congenital long QT syndrome. ECG monitoring is recommended in patients with electrolyte abnormalities, congestive heart failure, bradyarrhythmias, or patients taking concomitant medications that prolong the QT interval.[8,9] Refer to SPc for further information (www.medicines.org.uk).
- Patients should only be prescribed ondansetron to prevent acute nausea and vomiting for the days of receiving highly emetic chemotherapy and up to 24 hours after.
- Adult patients who receive high-dose chemotherapy with stem cell or bone marrow transplantation should be offered a three-drug combination of an NK1 receptor antagonist, a 5-HT3 receptor antagonist, and dexamethasone as per local trust funding.

Choice of Antiemetics[1]

- Consult Table 1 for the emetogenic potential of individual cytotoxic drugs.
- Refer to Appendix 2 and 3 for the emetogenic potential of individual protocols.
- For combination chemotherapy use the following algorithm. Identify the most emetogenic agent in the combination then –
  - for high and moderate: increase the emetogenicity by one level per agent.
  - Low – increase the emetogenicity by one level regardless of the number of agents.
  - Rare – do not contribute.
- For haematology patients, where a steroid is not a desirable antiemetic, substitute for a short course of a 5HT3 inhibitor (preferably 1 day).
- For multi-day regimens choose appropriate pre-chemotherapy regimen for each day and on discharge give the anti-emetics suggested for the day with the highest emetogenic potential.
- Drugs acting on the same receptor e.g. domperidone and metoclopramide or metoclopramide and prochlorperazine/ levomepromazine should not be used together as the risk of side effects will be increased without additional clinical benefit.
- Cyclizine should not be used in patients with severe heart failure as it can cause a reduction in cardiac output and an increase in heart rate.
- Cyclizine should not be combined with the pro-kinetics as the former will inhibit the action of the latter.
- Haloperidol can be considered in patients with renal failure.
- Metoclopramide, prochlorperazine, levomepromazine, haloperidol must not be used in patients with Parkinson's.
- Lorazepam maximum dose 4mg/24 hours in adults or 2mg/24 hours for the elderly.
- Carefully consider the risks and benefits of the use of steroids in diabetic patients and in patients who are immunocompromised.
- Omit dexamethasone pre-chemotherapy if patient is on a high dose steroid-containing regimen e.g. CHOP, ESHAP or if the patient is on high dose steroids for another medical reason.
- Consider alternative 5HT3 antagonist receptor antagonist formulations if patient cannot tolerate tablets eg ondansetron film or melts as per local Trust formulary.
- To ensure absorption in vomiting patients, consider route of administration eg. subcutaneous, intravenous, rectal, buccal, sublingual (Do **NOT** use suppositories in neutropenic patients)
- Consider Akynzeo (netupitant/ palonosetron) as an option for patients receiving 3 drug combinations for highly emetogenic chemotherapy as per local Trust availability.
- Ondansetron may increase the risk of arrhythmia and Torsade de pointes in patients:
  - with congenital long QT syndrome
  - with pre-existing hypokalaemia, hypomagnesemia or using medications that prolong interval [8,9].

Anti-emetic failure[1]

- This is defined as prolonged, distressing nausea or 2 or more episodes of vomiting in 24 hours.
- Move onto suggested regimen for next level of emetogenic potential. See Table 4.

On completion of chemotherapy[1]

- Omit oral dexamethasone if the patient is on a steroid-containing chemotherapy regimen e.g. CHOP or if the patient is receiving regular low dose steroid doses.
- Consider omitting the steroid or reducing length of course if the patient is on a weekly regimen or an oral cytotoxic course longer than 3 days.
- Consider gradual reducing dose for dexamethasone for patients who experience adverse events on stopping high dose steroids.

Action of anti-emetics on main receptor sites[1,27]

Drug	D_2 antagonist	H_1 antagonist	Muscarinic antagonist	$5HT_2$ antagonist	$5HT_3$ antagonist	$5HT_4$ agonist	NK1 inhibitor
Metoclopramide	++				+	++	
Domperidone	++						
Cyclizine		++	++				
Hyoscine hydrobromide			+++				
Haloperidol	+++				+/-		
Levomepromazine	++	+++	++	+++			
Aprepitant							+++
Fosaprepitant							+++
Ondansetron					+++		
Granisetron					+++		
Olanzapine	++	+	++	++	+		
Prochlorperazine	+++	++	+	+/++			

Table adapted from Twycross R, Wilcock A, - Palliative Care Formulary Fifth Edition (2014)

Anti-emetic information[1]

Please refer to BNF/SPC for more information

Ondansetron & Granisetron $5HT_3$ antagonist	Patients may complain of constipation and headaches. Patients need to be advised accordingly, e.g. macrogol +/- senna to relieve constipation and paracetamol to relieve headache. If severe, consider an alternative anti-emetic. Long acting second generation $5HT_3$ antagonists are available and may be used if locally approved. The MHRA (July 2013) have issued guidance regarding ondansetron infusion dilution and rates[9]: - In patients aged 75 years or older, a single dose of intravenous ondansetron for the prevention of CINV must not exceed 8mg (infused over at least 15mins). - In adult patients under 75 years, a single dose of intravenous ondansetron for prevention of CINV must not exceed 16mg (infused over at least 15mins. - Repeat intravenous dosing should be given no less than 4 hours apart.
Aprepitant & Fosaprepitant NK-1 Receptor antagonists	Aprepitant and fosaprepitant are NK-1 receptor antagonists and have been shown to inhibit emesis induced by cytotoxic chemotherapeutic agents, such as cisplatin, via central actions. In addition, studies show that aprepitant augments the antiemetic activity of the 5-HT_3-receptor antagonist and dexamethasone and inhibits both the acute and delayed phases of cisplatin-induced emesis When given in combinations with corticosteroids, the SPC suggests: reduce oral dexamethasone dose by 50%, reduce methylprednisolone IV dose by 25% and oral dose by 50%. NB for practical reasons it is not necessary to halve post chemotherapy dexamethasone doses as confirmed in the aprepitant trial data. Common side effects include headaches, hiccups and fatigue.
Cyclizine	Cyclizine may cause antimuscarinic side effects such as dryness of the mouth and drowsiness. Children and the elderly are more susceptible to these effects. Cyclizine should not be used in patients with severe heart failure as it can cause a reduction in cardiac output and an increase in heart rate. Cyclizine should not be combined with the pro-kinetics as the former will inhibit the action of the latter.
Dexamethasone	Corticosteroids can cause sleep disturbances, hyperactivity and excessive appetite. They also produce glucose-intolerance, use with care in patients with diabetes mellitus. Patients may experience perineal discomfort if the drug is given by iv bolus. This can be avoided by administration via IV infusion.
Domperidone	Domperidone should not be used when stimulation of the gastric motility could be harmful e.g. gastro-intestinal haemorrhage, mechanical obstruction or perforation.
Levomepromazine	Avoid in patients with liver dysfunction. Inhibits cytochrome P-450. Common side effects are somnolence, asthenia, dry mouth, hypotension, photosensitivity and skin reactions.
Lorazepam	Can cause drowsiness and may affect performance of skilled tasks (driving). Benzodiazepines have not demonstrated intrinsic antiemetic activity as single agents. Therefore, their place in antiemetic prophylaxis and treatment is adjunctive to other antiemetic agents. Maximum dose 4mg/24 hours for adults or 2mg/24 hours for the elderly.
Metoclopramide	Can rarely cause agitation or the development of extra-pyramidal symptoms particularly in the young female patients. These can occur up to 24 hours after a dose and may vary from facial grimacing and dystonic movements to odd feelings in the mouth, restlessness, somnolence and irritability. Bowel transit time may be reduced and some patients experience diarrhoea. The MHRA (August 2013) have issued guidance relating to the maximum dose and duration: For adults, the maximum licensed dose in 24 hours is 30mg. The usual dose is 10mg tds.
Prochlorperazine	Prochlorperazine should be avoided in patients with liver or renal dysfunction, Parkinson's disease, hypothyroidism, cardiac failure, phaeochromocytoma, myasthenia gravis, prostatic hypertrophy. A mild leukopenia occurs in up to 30% of patients on prolonged high dosage. May cause drowsiness.

Emetic Risk of Chemotherapy

The emetic risk of chemotherapy is shown in Table 1. Drug combinations have an additive emetic effect. If drugs from the same category are combined, the regimen is classified at a higher emetic risk. If drugs are from different categories, the emetic risk is according to the most emetic drug in the combination.

Table 1.Emetic Risk of Chemotherapy (1,2,3,4,10)

High Emesis Risk (>90% incidence)	Moderate Emesis Risk (30% to 90% incidence)	Low Emesis Risk (10% to 30% incidence)	Minimal Emesis Risk (<10% incidence)
IV chemotherapy AC/EC combination (doxorubicin/epirubicin + cyclophosphamide) Busulfan high doses Carboplatin ≥ 4AUC Carmustine >250mg/m^2 Cisplatin ≥ 70mg/m^2 Cyclophosphamide >1500 mg/m^2 Dacarbazine Doxorubicin >60mg/m^2 Epirubicin >90mg/m^2 Ifosfamide >2g/m^2 Mechlorethamine Streptozocin Oral chemotherapy Hexamethylmelamine Procarbazine	IV chemotherapy Actinomycin-D (dactinomycin) Alemtuzumab Altretamine Amsacrine Arsenic trioxide Azacitidine Bendamustine Bexarotene Carboplatin ≤ 4AUC Carmustine <250mg/m^2 Cisplatin <70mg/m^2 Clofaribine Cyclophosphamide <1500mg/m^2 Cytarabine >1000mg/m^2 Daunorubicin Doxorubicin <60mg/m^2 Epirubicin <90mg/m^2 Estramustine Etoposide>120mg/m^2 Idarubicin Ifosfamide <2g/m^2 Irinotecan Irinotecan liposomal injection Ixabepilone Lomustine Melphalan >100mg/m^2 Methotrexate >250 mg/m^2 Mifamurtide Mitoxantrone Oxaliplatin Raltitrexed Romidepsin Tegafur Uracil Teniposide Trabectedin Treosulfan Vorinostat Oral chemotherapy Bosutinib Ceritinib Crizotinib Cyclophosphamide Lenvatinib Temozolomide Trifluridine-tipiracil Vinorelbine	IV chemotherapy Aflibercept Alemtuzumab Amifostine <300mg/m^2 Asparaginase Atezolizumab Axitinib Belinostat Blinatumomab Bortezomib Brentuximab vedotin Cabazitaxel Carfilzomib Catumaxumab Cetuximab Cytarabine ≤1000mg/m^2 Decitabine Denileukin Dasatinib Daunorubicin (liposomal) Dexrazoxane Docetaxel Doxorubicin (liposomal) Elotuzumab Eribulin Etoposide Fluorouracil Gemcitabine Gemtuzumab Ipilimumab Ixabepilone Mercaptopurine Methotrexate <250mg/m^2 Mitomycin C Mitoxantrone Necitumumab Nelarabine Nivolumab Omacetaxine Pembrolizumab Paclitaxel Paclitaxel-albumin Panitumumab Pazopanib Pegaspargase Pemetrexed Pentostatin Pertuzumab Romidepsin Temsirolimus Thiotepa Topotecan Trastuzumab-Emantasine Tretinoin Valrubicin Vindesine Vinflunine	IV chemotherapy Bevacizumab Bleomycin Busulfan <10mg Cladribine Chlorambucil (oral) Daratumumab Fludarabine Nivolumab Obinituzumab Ofatumumab Pembrolizumab Pixantrone Pralatrexate Ramucirumab Rituximab Trastuzumab Vinblastine Vincristine Vinorelbine Oral chemotherapy Cabozantinib Chlorambucil Erlotinib Gefitinib Hydroxycarbamide Melphalan Methotrexate Pomalidomide Ruxolitinib Sorafenib Vemurafenib Vismodegib

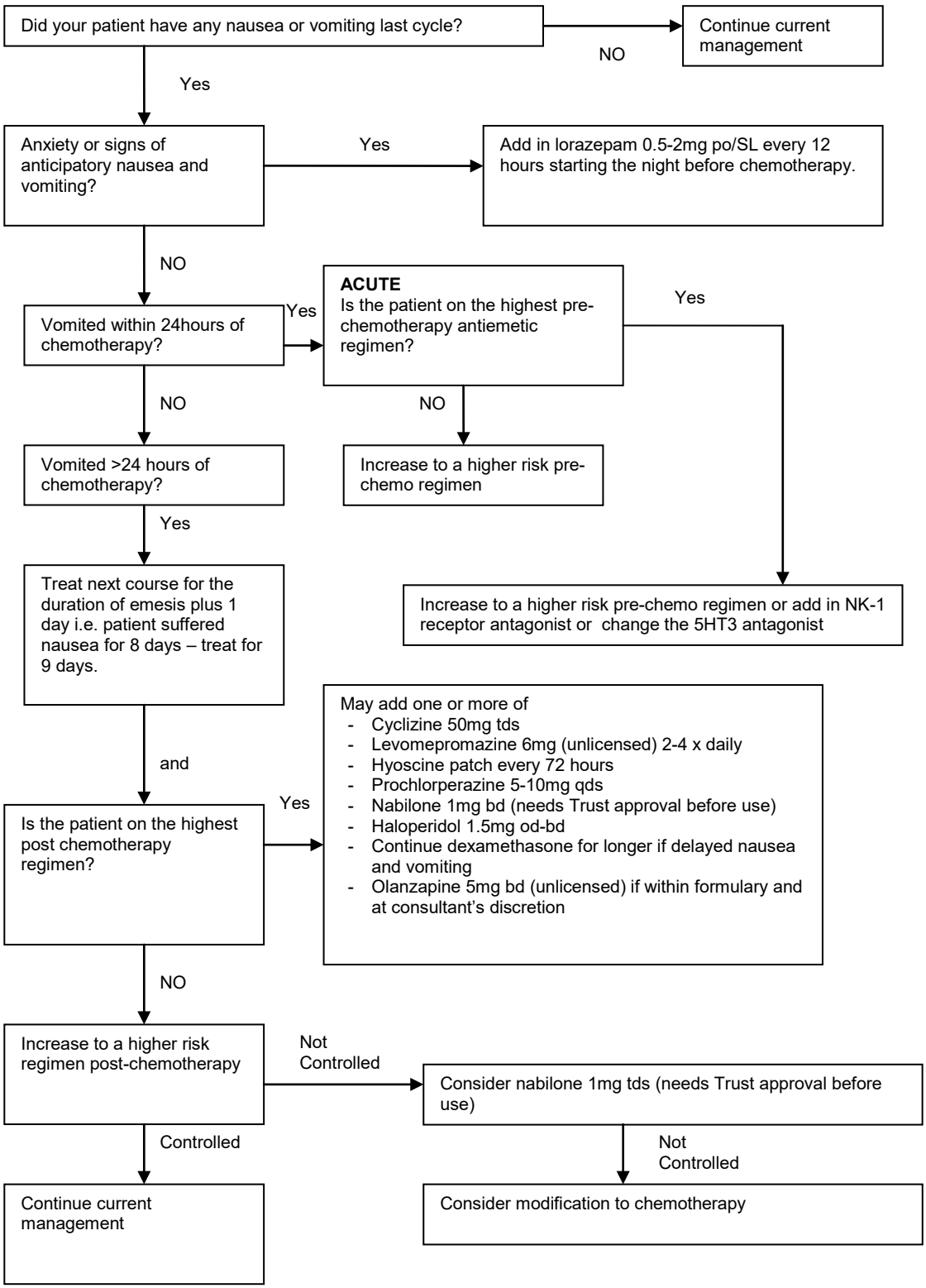
		Oral chemotherapy Afatinib Alectinib Axitinib Capecitabine Cobimetinib Dabrafenib Dasatinib Everolimus Etoposide <120mg/m^2 Fludarabine Ibrutinib Idelalisib Imatinib Ixazomib Lapatinib Lenalidomide Olaparib Osimertinib Nilotinib Palbociclib Pazopanib Ponatinib Panobinostat Regorafenib Sonidegib Sunitinib Tegafur uracil Thalidomide Tioguanine Trametinib Vandetanib Venetoclax Vorinostat	

Table 2. Recommended Daily Doses of 5-HT$_3$ Receptor Antagonists to be administered one hour prior to chemotherapy [2,3,4]. Preferable to administer orally where possible.

- Dolasetron 100mg od orally
- Granisetron 2mg od orally or 1mg intravenously
- Ondansetron 8mg b.d. orally or intravenously (preferred option)
- Palonosetron 0.25mg intravenously or 0.5mg orally
- Tropisetron 5mg od orally or intravenously

Table 3: Oral Antiemetic regimens to PREVENT chemotherapy induced nausea and vomiting (oral and iv are equally efficacious. Iv immediately before chemotherapy can be substituted for oral administration)		
Emetogenic Potential	Pre-chemotherapy Schedule (for each day of chemotherapy)	Post Chemotherapy (day after chemotherapy finished)
High Risk Risk of emesis > 90% Patients on an anthracycline and cyclophosphamide or cisplatin ≥ 70mg/m^2 or if aprepitant indicated (check local trust for funding for aprepitant/fosaprepitant)	(start antiemetics 1 hour pre- chemotherapy) **Single day treatment:** Aprepitant 125mg po/ Fosaprepitant 150mg iv 20-30 minutes on day 1 only Dexamethasone 12mg OD po/iv Ondansetron 8mg bd po/iv or locally approved 5HT-3 receptor antagonist as Table 2 above **Multiple Day Treatment:** Day 1: Aprepitant 125mg po/ Fosaprepitant 150mg iv 20-30 minutes on day 1 only Dexamethasone 12mg OD po/iv Ondansetron 8mg bd po/iv or locally approved 5HT-3 receptor antagonist **Subsequent days:** Aprepitant 80mg po 2/7 Dexamethasone 6mg bd on days of highly emetogenic chemotherapy Ondansetron 8mg bd po/iv or locally approved 5HT-3 receptor antagonist on days of highly emetogenic chemotherapy Metoclopramide 10mg-20mg tds po or domperidone 10mg po tds	Aprepitant 80mg po for 2/7 Ondansetron 8mg od po/iv or locally approved 5HT-3 receptor antagonist as Table 2 above for 1 dose Dexamethasone 6mg BD for 3 days after chemotherapy Metoclopramide 10mg-20mg po tds or domperidone 10mg po tds for 3/7 then 4/7 prn
High Risk Risk of emesis > 90% (without aprepitant)	(start antiemetics 1 hour pre- chemotherapy) Dexamethasone 12mg OD po/iv on days of highly emetogenic chemotherapy Ondansetron 8mg bd po/iv or locally approved 5HT-3 receptor antagonist On days of highly emetogenic chemotherapy Metoclopramide 10mg-20mg po tds or domperidone 10mg po tds for	Dexamethasone 6mg BD for 3 days after chemotherapy Ondansetron 8mg od po/iv or locally approved 5HT-3 receptor antagonist as Table 2 above for 1 dose Metoclopramide 10mg-20mg po tds or domperidone 10mg po tds for 3/7 then 4/7 prn
Moderate Risk Risk of emesis 30-90% (discuss use of dexamethasone in haematology regimens with local haematology team)	(start antiemetics 1 hour pre- chemotherapy) Dexamethasone 8mg OD po/iv Ondansetron 8mg bd po/iv or locally approved 5HT-3 receptor antagonist On days of moderately emetogenic chemotherapy Metoclopramide 10mg-20mg po tds or domperidone 10mg po tds	Dexamethasone 8mg OM for 2 days after chemotherapy Metoclopramide 10mg-20mg po tds or domperidone 10mg po tds for 3/7
Low Risk Risk of emesis 10-30%	(start antiemetics 1 hour pre- chemotherapy) Metoclopramide 10mg-20mg po tds	Metoclopramide 10mg-20mg po tds or domperidone 10mg tds PRN for 3/7
Minimal Risk Risk of emesis< 10%	No routine prophylaxis	
Anticipatory nausea and vomiting	If nausea and vomiting is well controlled during and after chemotherapy, anticipatory nausea is unlikely to occur	

Table 4: Breakthrough treatment for chemotherapy induced nausea and vomiting		
	Drug and Schedule	Comments
1st Line For patients not taking regular antiemetics	Metoclopramide 10mg-20mg po/iv TDS Or Domperidone 10mg po TDS	Do NOT use domperidone and metoclopramide together **(Patients should be informed to contact triage if they start vomiting at home. Delayed nausea and vomiting may cause acute renal failure due to dehydration exacerbating the nephrotoxicity of chemotherapy)**
2nd Line (1st line for patients already on antiemetics)	Prochloperazine po 5-10mg tds po or 3-6mg BD bucally Or Levomepromazine 6.25mg-12.5mg po od-tds po/sc Or Cyclizine 50mg po/iv tds	Prochlorperazine, levomepromazine/ cyclizine replaces metoclopramide or domperidone as post chemotherapy anti-emetic **(Patients should be informed to contact triage if they start vomiting at home. Delayed nausea and vomiting may cause acute renal failure due to dehydration exacerbating the nephrotoxicity of chemotherapy)**
3rd Line (2nd line for patients already on antiemetics)	Lorazepam 0.5-2mg po/iv/sublingual every 4-6 hours Or Haloperidol 1-2mg every 4-6 hours Or Nabilone 1-2mg po bd (needs Trust approval before use) Or Dexamethasone if not previously given Or Aprepitant 125mg OD for 1 day then 80mg OD for 2 days with next course of chemotherapy Or Olanzapine	Dexamethasone most useful agent for delayed nausea and vomiting. Consider gradual reducing course of dexamethasone for prolonged nausea and vomiting. It can be prescribed as Dexamethasone 4mg bd for 1 day, then 4mg od for day then 2mg od for 2 days Consider adding antacids/ proton pump inhibitors for patients that are sensitive to dexamethasone. **(Patients should be informed to contact triage if they start vomiting at home. Delayed nausea and vomiting may cause acute renal failure due to dehydration exacerbating the nephrotoxicity of chemotherapy)**


Did your patient have any nausea or vomiting last cycle?
NO
Continue current management
Yes
Anxiety or signs of anticipatory nausea and vomiting?
Yes
Add in lorazepam 0.5-2mg po/SL every 12 hours starting the night before chemotherapy.
NO
Vomited within 24hours of chemotherapy?
Yes
ACUTE
Is the patient on the highest pre-chemotherapy antiemetic regimen?
Yes
NO
Increase to a higher risk pre-chemo regimen
NO
Vomited >24 hours of chemotherapy?
Yes
Increase to a higher risk pre-chemo regimen or add in NK-1 receptor antagonist or change the 5HT3 antagonist
Treat next course for the duration of emesis plus 1 day i.e. patient suffered nausea for 8 days – treat for 9 days.
and
May add one or more of
- Cyclizine 50mg tds
- Levomepromazine 6mg (unlicensed) 2-4 x daily
- Hyoscine patch every 72 hours
- Prochlorperazine 5-10mg qds
- Nabilone 1mg bd (needs Trust approval before use)
- Haloperidol 1.5mg od-bd
- Continue dexamethasone for longer if delayed nausea and vomiting
- Olanzapine 5mg bd (unlicensed) if within formulary and at consultant's discretion
Yes
Is the patient on the highest post chemotherapy regimen?
NO
Increase to a higher risk regimen post-chemotherapy
Not Controlled
Consider nabilone 1mg tds (needs Trust approval before use)
Not Controlled
Consider modification to chemotherapy
Controlled
Continue current management

Section 2 Radiotherapy induced nausea & vomiting
The majority of patients having radiotherapy do not experience sickness: a significant minority do. It is the Clinicians responsibility to prescribe appropriate anti-emetics and for the radiographer to verify the anti-emetics have been prescribed where appropriate and to liaise with clinicians when necessary. Patients who are on radiotherapy and antineoplastic agents should receive antiemetic therapy appropriate for the emetic risk level of the antineoplastic agent unless the risk level of radiation is higher. During periods when prophylactic antineoplatic treatment has ended and ongoing radiation would be managed with its own prophylactic therapy, patients should use antiemetic that is appropriate for the emetic risk of the radiation therapy until the next period of antineoplastic therapy, rather than receiving rescue therapy as needed.

The incidence, severity and duration depend on
Site: most likely when upper abdomen included in treatment volume
Field Size: Large volumes increase the likelihood
Dose: Large single fractions more emetogenic than fractionated treatment

Pattern of emesis from a large single treatment:
Sudden and unexpected vomiting
Latency 2 hours
Acute phase 2-6 hours

Table 5:Risk of emesis with radiotherapy and prophylaxis[3]

Level of risk	Procedure/site of irradiation	Pre- Radiotherapy Medication	Anti-emetic breakthrough
High risk (>90%)	TBI Cranial Stereotactic radiosurgery	5HT3 antagonist starting 1 hour before each fraction and dexamethasone Prior to each fraction of RT and the day after each fraction if RT is not planned for the day	Metoclopramide 10mg-20mg TDS PRN for 3/7
Moderate Risk (30-90%)	Hemibody (upper or lower) Whole abdomino-pelvic field Craniospinal Upper abdominal fields including PA nodes	5HT3 antagonist daily approx 30 mins before each fraction Consider Dexamethasone* 4mg od days 1-5 or days of radiotherapy with PPI. (if ondansetron, increase up to 8 mg twice daily as needed)	Metoclopramide 10mg-20mg TDS PRN for 3/7
Low risk (10-30%)	Brain, head and neck, thorax, pelvis	No routine prophylaxis	Brain – consider Dexamethasone Head and neck, thorax or pelvis- consider Metoclopramide 10mg-20mg TDS PRN for 3/7
Minimal risk (<10%)	Extremities, breast	No routine prophylaxis	Metoclopramide 10mg-20mg TDS PRN for 3/7

NB for failure of anti-emesis where there is prolonged, distressing nausea or 2 or more episodes of vomiting in 24 hours treat as higher risk category

*Dexamethasone oral is dexamethasone phosphate whereas the injectable form available is dexamethasone base. Dexamethasone phosphate injection 4mg/ml are approximately equivalent to dexamethasone (base) injection 3.3mg/ml

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