Antiemetic Guidelines for Adult Patients Receiving Systemic Anti-Cancer Treatment and Radiotherapy

Document type
Guidance

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Author(s): Name(s) & Job Title(s)	Jarrod Dunn (Lead Clinical Cancer Services Pharmacist0				
Owner: Name(s) & Job Title(s)	Dr Emma Cattell (Consultant Medical Consultant & Trust Chemotherapy Lead)				
Approved by: Group / Committee Name	SACT Governance				
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1.0 FLOW CHART / ALGORITHM OR KEY STEPS (As appropriate to process)

Representing the key steps of a process / pathway / decision-making tree as a flow chart, algorithm or bullet points can provide readers with a quick-reference view. Especially useful where immediate action may be warranted or where processes may 'branch' depending on situation factors. This gives the reader immediate knowledge of the process.

2.0 MASCC/ESMO GUIDANCE SUMMARY – ACUTE NAUSEA & VOMITING SUMMARY

EMETIC RISK GROUP	ANTIEMETICS						
High Non-AC	5-HT_3	+	DEX	+	NK_1	+	OLZ
High AC	5-HT_3	+	DEX	+	NK_1	+	OLZ
Moderate Carboplatin ≥ AUC 5 Oxaliplatin women ≤ 50 years	5-HT_3	+	DEX	+	NK_1		
Moderate (other than above)*	5-HT_3	+	DEX				
Low	5-HT_3	OR	DEX	OR	DOP		
Minimal	No routine prophylaxis						

*The emetic potential of sacituzumab-govitecan and trastuzumab-deruxtecan appears to be at the high end of the moderate category, most closely resembling that of carboplatin. While prospective studies are needed it is suggested to prevent emesis as for carboplatin AUC ≥ 5.

5-HT_3 = serotonin$_3$ receptor antagonist	DEX = DEXAMETHASONE	NK_1 = neurokinin$_1$ receptor antagonist such as APREPITANT or FOSAPREPITANT or ROLAPITANT or oral or i.v. NEPA (combination of netupitant and palonosetron)	OLZ = OLANZAPINE	DOP = dopamine receptor antagonist

3.0 MASCC/ESMO GUIDANCE SUMMARY – DELAYED NAUSEA & VOMITING SUMMARY

EMETIC RISK GROUP	ANTIEMETICS		
High Non-AC*	OLZ	+	DEX
High AC*	OLZ		
Moderate Carboplatin ≥ AUC 5* Oxaliplatin women ≤ 50 years*	No additional routine prophylaxis		
Moderate (other than above)	No additional routine prophylaxis		
Low and Minimal	No additional routine prophylaxis		

*If aprepitant 125 mg is used on day 1, then aprepitant 80 mg x 1 should be administered days 2-3.

DEX = DEXAMETHASONE	OLZ = OLANZAPINE

4.0 INTRODUCTION

The purpose of this document is to provide guidance on the rational for use of anti-emetics for prevention and treatment of SACT 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 clinicians will need to exercise their expert clinical judgement when approaching the management of individual patients.

This guidance is intended for patients receiving systemic anti-cancer treatment (SACT) and radiotherapy at Somerset NHS Foundation Trust.

Within this document the term SACT is used to refer to all drugs with direct anti-tumour activity. This includes conventional chemotherapy, targeted treatments, monoclonal antibodies and immunotherapy. In addition, the guidelines have been updated to incorporate recommendations regarding the use of Checkpoint Inhibitors (CPIs) when given alongside conventional SACT.

Systemic anti-cancer treatment (SACT) induced nausea and vomiting is one of the most frequent side effects experienced by patients undergoing SACT. Patients often find SACT induced nausea and vomiting distressing, and anxiety about the recurrence of such symptoms on future cycles of SACT may itself become a cause. Modern drug treatment will successfully control SACT induced nausea and vomiting for the majority of patients.

As for SACT induced nausea and vomiting, the goal of antiemetic therapy for patients undergoing radiation treatment is to prevent or minimise the severity and duration of nausea and vomiting. The risk of radiation-induced emesis varies with the treatment administered.

The guidance was prepared by reviewing published guidelines on the subject. It should be noted that the definitions for low, moderate, high and very high differ from ASCO, MASCC and NCCN guidance. This is deliberate as the definition of “moderate” in these sources is 30-90% which will encompass most of the SACT regimens and therefore it will make it difficult to discern between such treatments.

These guidelines are intended to support clinicians when deciding on appropriate antiemetics and electronic ePrescribing systems such as Mosaiq™ will be updated in-line with guidance according to clinical need.

5.0 DEFINITIONS

Systemic anti-cancer treatment (SACT) is a collective term used to describe the growing number of differing systemic therapies used to provide cure, disease control and palliation in cancer. These include conventional chemotherapy, targeted treatments, monoclonal antibodies and immunotherapy.

Radiotherapy involves giving high-energy x-rays to destroy cancer cells in a specific area. Some normal cells in the area can also be damaged by radiotherapy, which can cause side effects. Radiotherapy is a local, rather than systemic treatment. Types of radiotherapy include external beam, brachytherapy, SABR and stereotactic radiosurgery.

Definitions of nausea and vomiting:

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

Grading of nausea and vomiting:

	Grade 1	**Grade 2**	**Grade 3**	**Grade 4**	**Grade 5**
Nausea	Nausea Loss of appetite without alteration in eating habits	Oral intake decreased without significant weight loss, dehydration or malnutrition; IV fluids indicated for <24hrs	Inadequate oral caloric or fluid intake; IV fluids, tube feeding or IVN indicated for ≥24hrs	Life-threatening consequences	Death
Vomiting	1 episode in 24 hours	2-5 episodes in 24 hrs; IV fluids indicated for less than 24hrs	≥6 episodes in 24 hrs; IV fluids or IVN indicated for ≥24hrs	Life-threatening consequences	Death

6.0 ROLES AND RESPONSIBILITIES

Role	Responsibility
Clinical Lead for SACT services	To ensure this protocol reflects safe practice for patients and is implemented correctly.
Cytotoxic Pharmacy Group	Responsible for reviewing this protocol and ensuring appropriate dissemination
Lead Cancer Services Pharmacist	Responsible for reviewing this protocol and ensuring it reflects safe practice.
Lead SACT Nurse	Responsible for ensuring this protocol is available on the Trust Intranet and reviewed regularly.
Ward Managers and Clinical Service Leads	Responsible for ensuring that nursing/medical staff are aware of this protocol and adhere to it appropriately.
Acute Haemato-Oncology Team	Ensure that all trained nurses within the HCS Directorate have an awareness and understanding of this protocol for the purpose of triage telephone calls and advise/prescribe antiemetics accordingly.

Trained nurses taking telephone triage calls	Responsible to refer to the protocol and document accurately any action taken on Mosaiq and on the Oncology/Haematology 24-hour helpline triage form.
Lead for Teaching and Training Junior Doctors	Responsible for ensuring doctors reviewing patients receiving SACT are aware of this protocol.
Clinicians undertaking SACT pre-assessment clinics	To ensure that guidelines within this protocol are followed.
Cancer Services Pharmacists	To ensure that guidelines within this protocol are followed and advise as and when required.

7.0 PROCESS DESCRIPTION

General Antiemetic recommendations for SACT and radiotherapy:

- Always commence antiemetics before SACT.
- Ideally give oral antiemetics at least 30 minutes before SACT commences.
- Antiemetics are best given regularly; not PRN, and courses should be completed. For example, when a dopamine receptor antagonist is used in the delayed nausea phase, it should be taken regularly for at least 2-3 days and then weaned over the next couple of days.
- Optimal emetic control in the acute phase is essential to prevent nausea and vomiting in the delayed phase.
- Where indicated, Dexamethasone/Prednisolone should be given prophylactically, and not as a treatment for emesis.
- Dexamethasone/Prednisolone should be given no later than 2pm to minimise wakefulness in the night.
- When appropriate, any 8mg Dexamethasone or 50mg Prednisolone pre-med prophylactic dose should ideally be given on the first day of treatment and the 4mg BD/25mg BD respective doses should be administered on subsequent days. However, it should be noted that as MASCC/ESMO's 2023 guidance found that one day of steroid demonstrated non-inferiority to 3 days of steroids for all regimens except for High-Risk Non-AC treatments, these recommendations are now less pertinent.
- Consider initiating Domperidone on the evening of SACT.
- Patients should always be provided with counselling on how to take their antiemetic medication as well as printed material conveying the same information.
- MASCC have recommended that acupuncture or electroacupuncture could be used as an adjunct to standard antiemetics, particularly when treating acute vomiting, although they note that any effects may be short-lived.
- Due to conflicting evidence, MASCC/ESMO's 2023 guidance didn't give any definitive recommendation regarding the use of ginger as an adjuvant treatment to standard antiemetics.

Also due to conflicting evidence in their 2023 guidance, MASCC/ESMO weren't able to recommend the use of acupressure or auricular acupressure. They did however say that the use of non-invasive electrical stimulation wasn't recommended. MASCC/ESMO's 2023 guidance also recommended the need to deliver appropriate nutritional advice/education on healthy eating practices and personalised diet plans through either a dietician or other suitable health care practitioner.

- In refractory cases, the adjunctive use of progressive muscle relaxation training (alone or with guided imagery) may also have a place in therapy.

See ***Appendix A*** for action of antiemetics on main receptor sites and further antiemetic information.

Choice of antiemetics for SACT:

For combination SACT, choose the appropriate regimen for the most emetogenic drug included.

Oral and intravenous formulations of antiemetics are generally believed to be equally effective and the use of liquid or oro-dispersible preparations should be used in preference to the parenteral or topical routes as they are generally cheaper.

For haematology patients, where a steroid is not a desirable antiemetic, substitute a short course of a 5-HT_3 inhibitor (preferably 1 day).

For multi-day regimens choose appropriate pre-SACT regimen for each day and on discharge give the antiemetics 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.

Other causes of nausea and vomiting should also be considered. These could include one or more of the following:

- Radiotherapy
- Radiosensitisers
- 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, brain)
- Paraneoplasia
- Other emetogenic medication (e.g. opioids, antibiotics, antifungals, amifostine)
- Psychophysiological factors including anxiety and anticipatory nausea and vomiting
- Vestibular dysfunction

Because of the increased risk of serious ventricular arrhythmias or sudden cardiac death with domperidone, the dose should be restricted to 10mg tds and unless absolutely necessary, the duration should generally be limited to 1 week.

When choosing antiemetics, individual patient factors should also be considered. Patients with 3 or more of the follow risk factors should be considered to receive additional antiemetics at the outsets:

- female
- <30 years of age
- history of sickness (e.g. pregnancy hyperemesis, travel sickness, during surgery)
- emesis with previous chemotherapy
- underlying nausea and vomiting
- anxiety

Previous high alcohol intake can have a protective effect and reduce the risk of emesis.

In diabetic patients and patients who are immunocompromised, the risks and benefits of the use of steroids must be carefully considered by the prescribing clinician.

Omit dexamethasone/prednisolone pre-SACT if patient is on a high dose steroid-containing regimen e.g. R-CHOP, or if the patient is on high dose steroids for another medical reason.

In the event of antiemetic failure (defined as prolonged and distressing nausea (4 hours of moderate to severe nausea) and/or ≥2 episodes of vomiting in 24 hours), move onto the suggested antiemetics for the next level of emetogenic potential.

Consider omitting the post-SACT steroid or reducing length of course if the patient is on a weekly regimen or an oral SACT course longer than 3 days. This is supported by the latest MASCC/ESMO 2023 guidelines which recommend that a giving a corticosteroid on day 1 for High-Risk Non-AC treatments is as effective as giving a prolonged course.

Consider a gradual reducing weaning dose of corticosteroid in patients who experience adverse effects when stopping high dose steroids.

Haloperidol is a useful agent in patients with renal impairment although use a reduced dose.

5-HT_3 inhibitor therapy should be administered on Day 1 of treatment for moderate to high/very high risk of emesis regimens. 5-HT_3 inhibitors can be continued for short courses if required, however use for > 3 days is not routinely recommended due to the risk of constipation. Occasional patients may require an extended course but should be prescribed concomitant laxative(s).

Consider the use of other routes of administration (e.g. subcutaneous, intravenous, rectal, buccal, sublingual, etc. (Do NOT use suppositories in patients with neutropenia).

Ondansetron (particularly when given intravenously) may increase the risk of arrhythmia and Torsade de pointes, especially in patients with: Congenital long QT syndrome, Pre-existing hypokalaemia, hypomagnesaemia or using alongside other medication which also prolong the QT interval.

Guidance for patients receiving Checkpoint Inhibitors (CPIs):

Checkpoint inhibitors (CPIs) represent a significant new therapeutic approach in many cancers. Concerns have been raised about the potential for concurrent corticosteroid use to adversely affect the therapeutic antineoplastic efficacy of CPIs through their immunosuppressive effects.

In order to ascertain whether the use of corticosteroids used to prevent emesis and hypersensitivity reactions used in conventional chemotherapy adversely affects the efficacy of CPIs, ASCO convened an Expert Panel and undertook a systematic review and meta-analysis of a number of randomised controlled trials.

ASCO reported that there was no clinical evidence to warrant the omission of dexamethasone from guideline-compliant prophylactic antiemetic when CPIs are administered in combination with chemotherapy although in general, dexamethasone should be administered **AFTER** the CPI.

They also reemphasised that CPIs administered alone or in combination with another CPI **do not** require the routine use of a prophylactic antiemetic.

Antiemetics selection for SACT regimens:

Emetogenic potential	Pre-SACT (for each day of SACT)	Post-SACT (day after SACT completed)	Antiemetic failure
Minimal: risk of emesis ≤10%	No routine antiemetics usually required	No routine antiemetics usually required. For first course of SACT, consider prescribing: Domperidone 10mg tds PRN PO ***OR*** Metoclopramide 10mg tds PRN PO ***OR*** Cyclizine 50mg tds PRN PO	If no routine antiemetics taken, give 1st line antiemetics for breakthrough. No change in treatment for subsequent cycles. If routine antiemetics previously taken then manage subsequent cycles as moderately emetogenic
Low: risk of emesis 10-30%	**i) Corticosteroid** Dexamethasone 8mg PO/IV **OR** Prednisolone 50mg PO **- OR -** **ii) Locally Approved 5-HT$_3$ Antagonist†** Ondansetron 8mg PO/IV ***OR*** Granisetron 2mg PO ***OR*** Granisetron 1mg IV **- OR –** **iii) Dopamine Antagonist** Metoclopramide 10mg PO/IV	No routine antiemetics usually required. For first course of SACT, consider prescribing: Domperidone 10mg PO tds PRN ***OR*** Metoclopramide 10mg PO tds PRN ***OR*** Cyclizine 50mg PO tds PRN ***- AND/OR -*** **Locally Approved 5-HT$_3$ Antagonist†** Ondansetron 8mg PO od-bd PRN ***OR*** Granisetron 1mg bd or 2mg od PO PRN	If no routine antiemetics taken, give 1st line antiemetics for breakthrough. No change in treatment for subsequent cycles. If routine antiemetics previously taken then manage subsequent cycles as moderately emetogenic
Emetogenic potential	**Pre-SACT (for each day of SACT)**	**Post-SACT (day after SACT completed)**	**Antiemetic failure**

Emetogenic potential	Pre-SACT (for each day of SACT)	Post-SACT (day after SACT completed)	Antiemetic failure
Moderate: risk of emesis: 30-60%	**i) Corticosteroid** Dexamethasone 8mg PO/IV **OR** Prednisolone 50mg PO **- AND -** **ii) Locally Approved 5-HT_3 Antagonist†** Ondansetron 8mg PO/IV ***OR*** Granisetron 2mg PO ***OR*** Granisetron 1mg IV **OR** Palonosetron¥ 250mg IV **- AND -** **For Patients Receiving Carboplatin ≥AUC5 or Oxaliplatin€** **iii) Neurokinin$_1$ Receptor Antagonist (NK_1)** Aprepitant*‡Ω 125mg PO	No routine antiemetics usually required. For first course of SACT, consider prescribing: Domperidone 10mg PO tds PRN ***OR*** Metoclopramide 10mg PO tds PRN ***OR*** Cyclizine 50mg PO tds PRN ***- AND/OR –*** **Locally approved 5-HT_3 Antagonist†** Ondansetron 8mg PO od-bd PRN ***OR*** Granisetron 1mg bd or 2mg od PO PRN ***- AND -*** **For Patients Receiving Carboplatin ≥AUC5 or Oxaliplatin€** **Neurokinin$_1$ Receptor Antagonist (NK_1)** Aprepitant*†Ω 80mg od PO for 2 days	Commence with 2nd line antiemetics for breakthrough. Manage subsequent cycles as highly emetogenic

† The 5-HT_3 antagonist of choice is currently ondansetron

‡ In diabetic patients it is appropriate to use Aprepitant 125mg PO on day of chemo and a reduced-dose steroid regimen (e.g. 2mg bd for dexamethasone) on days 2 & 3)

* Whenever aprepitant/netupitant is given in combination with a corticosteroid, reduce the dexamethasone dose and oral methylprednisolone doses by 50% and reduce the IV methylprednisolone dose by 25%. In practice, this means that the dexamethasone should generally be a maximum dose of 8-10mg. It is not necessary to reduce post-SACT doses of either corticosteroid. If a NK-1 inhibitor is not used, higher dose of dexamethasone (12-16mg) may be used.

Ω IV fosaprepitant can be used instead of aprepitant in patients unable to swallow or should they have significant mucositis or absorption problems. An oral suspension containing 125mg of aprepitant is also available. Alternatively, aprepitant capsules can be opened and mixed with water.

¥ Palonosetron is currently non-formulary but is due to be reviewed by the DTC

∞ Granisetron (Sancuso®) 3.1mg/24hours patches are available although due to cost should be reserved for patients who are unable to swallow or should they have significant mucositis or absorption problems. Patches should be applied to clean, non-irritated, non-hairy skin on the upper arm (or abdomen if upper arm cannot be used) 24-48

Emetogenic potential	Pre-SACT (for each day of SACT)	Post-SACT (day after SACT completed)	Antiemetic failure

hours before treatment and can be left on for up to 7 days.

€ Although MASCC/ESMO only recommended a NK_1 in female patients receiving oxaliplatin who are ≤50 years of age, for logistical reasons, it has been decided that to include it for all patients. However, it can be removed if required for any male patient or female >50.

Emetogenic potential	Pre-SACT (for each day of SACT)	Post-SACT (day after SACT completed)	Antiemetic failure
High or Very High: risk of **emesis: ≥60%*** ***Anthracycline-Cyclophosphamide (AC)-Based Chemotherapy*** **Δ The 5-HT_3 Antagonist + NK_1 can be substituted with Palonosetron 0.5mg + Netupitant 300mg (Akynzeo®)* although aprepitant remains the 1st-line agent**	**i) Corticosteroid** Dexamethasone* 8mg (12-20mg) PO/IV **OR** Prednisolone 50mg PO **- AND -** **ii) Locally Approved 5-HT_3 Antagonist†Δ** Ondansetron 8mg PO/IV ***OR*** Granisetron 2mg PO ***OR*** Granisetron 1mg IV **OR** Palonosetron¥ 250mg IV **- AND –** **iii) Neurokinin$_1$ Receptor Antagonist (NK_1)Δ** Aprepitant*‡Ω 125mg PO **- AND –** **iv) Olanzapine** Olanzapineζ 2.5-5mg (max 10mg) PO	Olanzapineζ 2.5-5mg (max 10mg) od PO for 4 Days and then PRN ***- AND -*** Aprepitant*†Ω 80mg od PO for 2 days (no post-SACT NK-1 inhibition is required if fosaprepitant was used) ***- AND -*** Domperidone 10mg tds PO PRN ***OR*** Metoclopramide 10mg tds PO PRN ***OR*** Cyclizine 50mg tds PO PRN ***- AND/OR -*** Consider Levomepromazine 6-6.25mg nocte (max qds) PO PRN	Commence with 3rd line antiemetics for breakthrough. Manage subsequent cycles as high or very high risk of emesis: ≥90% Non-AC-Based Chemotherapy if nausea and vomiting has resulted in hospital admission Should patients continue to experience nausea or vomiting despite optimal prophylaxis then lorazepam 0.5-1mg given orally, sublingually/buccally or intravenously 30 minutes before SACT is given should be added to the antiemetic schema. Patients may also benefit from oral lorazepam the night before and/or on the morning of SACT. Alprazolam 0.5-1mg (max 2mg) nocte PO may be used as an alternative.

† The 5-HT_3 antagonist of choice is currently ondansetron

* Whenever aprepitant/netupitant is given in combination with a corticosteroid, reduce the dexamethasone dose and oral methylprednisolone doses by 50% and reduce the IV methylprednisolone dose by 25%. In practice, this means that the dexamethasone should generally be a maximum dose of 8-10mg. It is not necessary to reduce post-SACT doses of either corticosteroid. If a NK-1 inhibitor is not used, higher dose of dexamethasone (12-16mg) may be used.

Ω IV fosaprepitant can be used instead of aprepitant in patients unable to swallow or should they have significant mucositis or absorption problems. An oral suspension containing 125mg of aprepitant is also available. Alternatively, aprepitant capsules can be opened and mixed with water.

Emetogenic potential	Pre-SACT (for each day of SACT)	Post-SACT (day after SACT completed)	Antiemetic failure

¥ Palonosetron is currently non-formulary but is due to be reviewed by the DTC

∞ Granisetron (Sancuso®) 3.1mg/24hours patches are available although due to cost should be reserved for patients who are unable to swallow or should they have significant mucositis or absorption problems. Patches should be applied to clean, non-irritated, non-hairy skin on the upper arm (or abdomen if upper arm cannot be used) 24-48 hours before treatment and can be left on for up to 7 days.

ζ Although olanzapine 10mg PO od was recommended in the MASCC/ESMO's 2023 guidelines, as patients have previously struggled with this dose due to marked sedation & dizziness, lower doses of 5mg on Day 1 and then 2.5mg od on days 2 – 4 may be better tolerated and more appropriate in routine clinical practice. 5mg has been shown to be superior to placebo although it remains unknown as to whether this is as effective as 10mg.

Emetogenic potential	Pre-SACT (for each day of SACT)	Post-SACT (day after SACT completed)	Antiemetic failure
High or Very High: risk of emesis: ≥60%* ***Non-Anthracycline-Cyclophosphamide (Non-AC)-Based Chemotherapy***	**i) Corticosteroid** Dexamethasone* 8mg (12-20mg) PO/IV **OR** Prednisolone 50mg PO **- AND –** **ii) Olanzapine** Olanzapineζ 2.5-5mg (max 10mg) PO **- AND –** **iii) 5-HT_3 + NK_1 Antagonist†** Palonosetron 0.5mg + Netupitant 300mg (Akynzeo®)* PO **- OR –** **iv) Locally Approved 5-HT_3 Antagonist†** Ondansetron 8mg PO/IV ***OR*** Granisetron 2mg PO ***OR*** Granisetron 1mg IV **OR** Palonosetron¥ 250mg IV **- AND –**	Olanzapineζ 2.5-5mg (max 10mg) od PO for 4 Days and then PRN ***- AND –*** Dexamethasone 8mg PO daily (as a single dose or in two divided doses) for 3 days ***- AND -*** Aprepitant*†Ω 80mg od PO for 2 days (no post-SACT NK-1 inhibition is required if fosaprepitant was used) ***- AND -*** Domperidone 10mg tds PO PRN ***OR*** Metoclopramide 10mg tds PO PRN ***OR*** Cyclizine 50mg tds PO PRN ***- AND/OR -*** Consider Levomepromazine 6-6.25mg nocte (max qds) PO PRN	If nausea and/or vomiting >7 days, consider corticosteroid-induced dyspepsia and commence proton-pump inhibitor (PPI). Should patients continue to experience nausea or vomiting despite optimal prophylaxis then lorazepam 0.5-1mg given orally, sublingually/buccally or intravenously 30 minutes before SACT is given should be added to the antiemetic schema. Patients may also benefit from oral lorazepam the night before and/or on the morning of SACT. Alprazolam 0.5-1mg (max 2mg) nocte PO may be used as an alternative.

Emetogenic potential	Pre-SACT (for each day of SACT)	Post-SACT (day after SACT completed)	Antiemetic failure
	v) Neurokinin$_1$ Receptor Antagonist (NK$_1$) Aprepitant*‡Ω 125mg PO		

† The 5-HT$_3$ antagonist of choice is currently ondansetron. Aprepitant PLUS a 5HT$_3$ (currently ondansetron) are the preferred 5HT$_3$/NK$_1$ agents in high to very-high risk emesis in AC-Based Chemotherapy although it may be substituted with Palonsetron + Netupitant (Akynzeo®) if there are supply issues or if preferred.

‡ In diabetic patients, or in weekly highly emetic regimens (e.g. weekly cisplatin) it is appropriate to use Aprepitant 125mg PO on day of chemo and a reduced-dose steroid regimen (e.g. 2mg bd for dexamethasone) on days 2 & 3)

* Whenever aprepitant/netupitant is given in combination with a corticosteroid, reduce the dexamethasone dose and oral methylprednisolone doses by 50% and reduce the IV methylprednisolone dose by 25%. In practice, this means that the dexamethasone should generally be a maximum dose of 8-10mg. It is not necessary to reduce post-SACT doses of either corticosteroid. If an NK-1 inhibitor is not used, higher dose of dexamethasone (12-16mg) may be used.

Ω IV fosaprepitant can be used instead of aprepitant in patients unable to swallow or should they have significant mucositis or absorption problems. An oral suspension containing 125mg of aprepitant is also available. Alternatively, aprepitant capsules can be opened and mixed with water.

¥ Palonosetron is currently non-formulary but is due to be reviewed by the DTC

∞ Granisetron (Sancuso®) 3.1mg/24hours patches are available although due to cost should be reserved for patients who are unable to swallow or should they have significant mucositis or absorption problems. Patches should be applied to clean, non-irritated, non-hairy skin on the upper arm (or abdomen if upper arm cannot be used) 24-48 hours before treatment and can be left on for up to 7 days.

Emetogenic potential	Pre-SACT (for each day of SACT)	Post-SACT (day after SACT completed)	Antiemetic failure
High or Very high: risk of **emesis >90%** ***NON-Anthracycline-Cyclophosphamide (AC)-Based Chemotherapy* (including Moderate-High Dose Cisplatin Based Regimens)**	**SINGLE DAY TREATMENT** Palonosetron 0.5mg + Netupitant 300mg (Akynzeo®) **AND** Dexamethasone* 8mg (12-20mg) PO/IV ***AND/OR*** Olanzapine 2.5-5mg (max 10mg) od PO	Dexamethasone 8mg PO daily (as a single dose or in two divided doses) for 2-3 days ***AND*** Domperidone 10mg tds PO PRN ***OR*** Metoclopramide 10mg tds PO PRN ***OR*** Cyclizine 50mg tds PO ***AND/OR*** Consider Levomepromazine 6-6.25mg nocte (max qds) PO PRN	If nausea and/or vomiting >7 days, consider corticosteroid-induced dyspepsia and commence proton-pump inhibitor (PPI). In addition, ensure that one of the prophylactic antipsychotics (e.g. olanzapine or haloperidol) have also been used. Should patients continue to experience nausea or vomiting despite optimal prophylaxis then lorazepam 0.5-1mg given orally, sublingually/buccally or intravenously 30 minutes

Emetogenic potential	Pre-SACT (for each day of SACT)	Post-SACT (day after SACT completed)	Antiemetic failure
		OR Haloperidol 0.5-1.5mg tds for 3-5 days (or continuously) & then PRN PO ***OR*** Olanzapine 2.5-5mg (max 10mg) od for 3-5 days (or continuously) & then PRN PO	before SACT is given should be added to the antiemetic schema. Patients may also benefit from oral lorazepam the night before and/or on the morning of SACT. Alprazolam 0.5-1mg (max 2mg) nocte PO may be used as an alternative.
High or Very high: risk of **emesis >60%** ***NON-Anthracycline-Cyclophosphamide (AC)-Based Chemotherapy* (including Moderate-High Dose Cisplatin Based Regimens)**	**MULTIPLE DAY TREATMENT**		
	DAY 1: as above for single day treatment	**SUBSEQUENT DAYS:** Dexamethasone 8mg PO/IV ***AND/OR*** Olanzapine 2.5-5mg (max 10mg) od PO ***PLUS*** Adjuncts as detailed above. Continue until 2 days after treatment has finished	

† Palonsetron + Netupitant (Akynzeo®) is the preferred $5HT_3/NK_1$ agent in high to very-high risk emesis in non-AC-Based Chemotherapy although it may be substituted with aprepitant PLUS a $5HT_3$ if there are supply issues or if preferred.

* Whenever aprepitant/netupitant is given in combination with a corticosteroid, reduce the dexamethasone dose and oral methylprednisolone doses by 50% and reduce the IV methylprednisolone dose by 25%. In practice, this needs that the dexamethasone should generally be a maximum dose of 8-10mg. It is not necessary to reduce post-SACT doses of either corticosteroid. If an NK-1 inhibitor is not used, higher dose of dexamethasone (12-16mg) may be used.

Ω IV fosaprepitant can be used instead of aprepitant in patients unable to swallow or should they have significant mucositis or absorption problems. Alternatively, aprepitant capsules can be opened and mixed with water.

¥ Palonosetron is currently non-formulary but is due to be reviewed by the DTC

∞ Granisetron (Sancuso®) 3.1mg/24hours patches are available although due to cost should be reserved for patients who are unable to swallow or should they have significant mucositis or absorption problems. Patches should be applied to clean, non-irritated, non-hairy skin on the upper arm (or abdomen if upper arm cannot be used) 24-48 hours before treatment and can be left on for up to 7 days.

Emetogenic potential	Pre-SACT (for each day of SACT)	Post-SACT (day after SACT completed)	Antiemetic failure
Anticipatory	If nausea and vomiting are well controlled during		Lorazepam 0.5-1mg orally,

Emetogenic potential	Pre-SACT (for each day of SACT)	Post-SACT (day after SACT completed)	Antiemetic failure
Nausea and Vomiting	and after SACT, anticipatory nausea and vomiting is unlikely to occur.		sublingually/buccally or intravenously 30 minutes before SACT is given. Patients may benefit from oral lorazepam the night before and/or on the morning of SACT. Alprazolam 0.5-1mg (max 2mg) nocte PO may be used as an alternative.
Checkpoint Inhibitors (CPIs)	The addition of a CPI to chemotherapy does not the above guideline recommendation for an antiemetic regimen based on the emetogenicity of the agent(s) administered. CPIs administered alone or in combination with another CPI are minimally emetogenic and **do not** require the routine use of a prophylactic antiemetic although if required then either metoclopramide and/or a 5-HT_3 antagonist should be given.		

Treatment of SACT induced breakthrough nausea and vomiting:

Line	Drug and schedule	Comments
1st Line (patients not taking regular antiemetics)	Olanzapine 2.5-5mg (max 10mg)* PO od for 4 days ***OR*** Domperidone 10mg PO tds ***OR*** Metoclopramide 10mg PO/IV tds ***OR*** Cyclizine 50mg PO tds	Prescribe regularly in addition to recommended post-SACT antiemetics DO NOT use domperidone and metoclopramide together.
2nd Line	Olanzapine 2.5-5mg (max 10mg)* PO od for 5-7 days **OR** Levomepromazine 6.25mg bd PO **OR** Prochlorperazine 5-10mg PO tds or 25mg PR tds (Alternatively, buccal prochlorperazine (Buccastem®) 3-6mg bd can be quite useful for breakthrough in patients who are vomiting or have difficulties swallowing tablets **OR** Cyclizine 50mg PO/IV tds	Levomepromazine / prochlorperazine / cyclizine replaces domperidone / metoclopramide as post-SACT antiemetic

3rd Line	Olanzapine 2.5-5mg (max 10mg)* PO od continuously ***OR*** Granisetron 1mg IV ***OR*** Ondansetron 8mg PO/IV ***AND/OR*** Levomepromazine 6.25mg PO up to tds or 6.25-12.5mg SC ***OR*** Haloperidol 1-2mg qds or 1-3mg IV tds ***AND/OR*** Cyclizine[α] 50mg SC tds or 150mg SC continuous infusion over 24 hours ***AND/OR*** Lorazepam 0.5-1mg PO qds (as adjunct rather than being given stat) ***AND/OR*** Nabilone[†] 1-2mg PO bd - tds	Use short-course only Levomepromazine / prochlorperazine / cyclizine replaces domperidone / metoclopramide as post-SACT antiemetic S/C infusion of cyclizine[α] may be considered 1st or 2nd line if severe vomiting occurs in patients Concomitant use of cyclizine & domperidone / metoclopramide should be avoided because of the well-documented antagonism between anticholinergics and dopamine antagonists

* Although olanzapine 10mg PO od was recommended in the MASCC/ESMO's 2023 guidelines, as patients have previously struggled with this dose due to marked sedation & dizziness, lower doses of 5mg on Day 1 and then 2.5mg od on days 2 – 4 may be better tolerated and more appropriate in routine clinical practice. 5mg has been shown to be superior to placebo although it remains unknown as to whether this is as effective as 10mg.

[†] Nabilone has been recommended by NICE (NG144) as a treatment option in patients with chemotherapy-induced nausea and vomiting which persists despite receiving optimised conventional antiemetics. Evidence for the benefit of medicinal cannabinoids is somewhat limited and they are not recommended in ASCO and MASCC guidance and therefore should only be used as a last resort. Only nabilone is currently licensed in the UK and is listed under Schedule 2 of the Misuse of Drugs Regulations 2001 so needs to be prescribed using full controlled drug requirements. As nabilone is non-formulary, an application to the DTC would be required before it could be used.

The recommended dose of nabilone is 1mg PO bd, increased if necessary to 2mg bd throughout each cycle of SACT and, if necessary, for 48 hours after the last dose of each cycle. The first dose should be taken the night before treatment and the second dose 1–3 hours before the first dose of SACT. The maximum recommended daily dose is 2mg tds.

Line	Drug and schedule	Comments
1st Line (patients not taking regular antiemetics)	Olanzapine 2.5-5mg (max 10mg)* PO od for 4 days ***OR*** Domperidone 10mg PO tds ***OR*** Metoclopramide 10mg PO/IV tds ***OR*** Cyclizine 50mg PO tds	Prescribe regularly in addition to recommended post-SACT antiemetics DO NOT use domperidone and metoclopramide together.

2nd Line	Olanzapine 2.5-5mg (max 10mg)* PO od for 5-7 days **OR** Levomepromazine 6.25mg bd PO **OR** Prochlorperazine 5-10mg PO tds or 25mg PR tds (Alternatively, buccal prochlorperazine (Buccastem®) 3-6mg bd can be quite useful for breakthrough in patients who are vomiting or have difficulties swallowing tablets **OR** Cyclizine 50mg PO/IV tds	Levomepromazine / prochlorperazine / cyclizine replaces domperidone / metoclopramide as post-SACT antiemetic
3rd Line	Olanzapine 2.5-5mg (max 10mg)* PO od continuously ***OR*** Granisetron 1mg IV ***OR*** Ondansetron 8mg PO/IV ***AND/OR*** Levomepromazine 6.25mg PO up to tds or 6.25-12.5mg SC ***OR*** Haloperidol 1-2mg qds or 1-3mg IV tds ***AND/OR*** Cyclizine$^{\alpha}$ 50mg SC tds or 150mg SC continuous infusion over 24 hours ***AND/OR*** Lorazepam 0.5-1mg PO qds (as adjunct rather than being given stat) ***AND/OR*** Nabilone† 1-2mg PO bd - tds	Use short-course only Levomepromazine / prochlorperazine / cyclizine replaces domperidone / metoclopramide as post-SACT antiemetic S/C infusion of cyclizine$^{\alpha}$ may be considered 1st or 2nd line if severe vomiting occurs in patients Concomitant use of cyclizine & domperidone / metoclopramide should be avoided because of the well-documented antagonism between anticholinergics and dopamine antagonists

* Although olanzapine 10mg PO od was recommended in the MASCC/ESMO's 2023 guidelines, as patients have previously struggled with this dose due to marked sedation & dizziness, lower doses of 5mg on Day 1 and then 2.5mg od on days 2 – 4 may be better tolerated and more appropriate in routine clinical practice. 5mg has been shown to be superior to placebo although it remains unknown as to whether this is as effective as 10mg.

† Nabilone has been recommended by NICE (NG144) as a treatment option in patients with chemotherapy-induced nausea and vomiting which persists despite receiving optimised conventional antiemetics. Evidence for the benefit of medicinal cannabinoids is somewhat limited and they are not recommended in ASCO and MASCC guidance and therefore should only be used as a last resort. Only nabilone is currently licensed in the UK and is listed under Schedule 2 of the Misuse of Drugs Regulations 2001 so needs to be prescribed using full controlled drug requirements. As nabilone is non-formulary, an application to the DTC would be required before it could be used.

The recommended dose of nabilone is 1mg PO bd, increased if necessary to 2mg bd throughout each cycle of SACT and, if necessary, for 48 hours after the last dose of each cycle. The first dose should be taken the night before treatment and the

second dose 1–3 hours before the first dose of SACT. The maximum recommended daily dose is 2mg tds.

Emetic potential of individual SACT drugs (This list is not exhaustive):

Minimal (<10%)	Low (10-30%)	Moderate (30-60%)	High (60-90%)	Very High (>90%)
Asparaginase	5-Fluorouracil (5FU)	Alemtuzumab	Altretamine	Anthracycline / cyclophosphamide (EC/FEC/AC/FAC)
Atezolizumab	Afatinib	Azacitidine	Amsacrine	
Avelumab	Aflibercept	Bendamustine	Arsenic trioxide[β]	
Belantamab mafodotin	Alectinib	Bexarotene	Azacitidine	
	Alemtuzumab	Carboplatin ≤AUC4	Bosutinib	Busulfan (High Doses)
Bevacizumab	Amifostine<300mg/m^2	Carmustine <250mg/m^2	Busulfan (Mod Doses)	Carmustine 250mg/m^2
Bleomycin	Axitinib	Clofarabine	Cabozantinib	Cisplatin >70mg/m^2
Busulfan <10mg	Belinostat	Cyclophosphamide 500mg–750mg/m^2	Carboplatin >AUC4	Cyclophosphamide ≥1500mg/m^2
Cemiplimab	Blinatumumab		Carmustine≥250mg/m^2	
Chlorambucil	Bortezomib	Cytarabine ≤1g/m^2	Ceritinib	Dacarbazine
Cladribine	Brentuximab vedotin	Dactinomycin (Actinomycin-D)	Cisplatin ≤70mg/m^2	Doxorubicin ≥60mg/m^2
Daratumumab	Cabazitaxel		Crizotinib	Epirubicin ≥90mg/m2
Dostarlimab	Capecitabine	Daunorubicin<50mg/m^2	Cyclophosphamide 750-1500mg/m^2	Hexamethylmelamine
Durvalumab	Carfilzomib	Doxorubicin <60mg/m^2		Ifosfamide >3g/m^2
Erlotinib	Cetuximab	Estramustine	Cytarabine >1g/m^2	Mechlorethamine
Fludarabine	Cobimetinib	Etoposide >120mg/m^2	Dactinomycin (Actinomycin-D)	Procarbazine
Gefitinib	Cyclophosphamide≤500mg	Idarubicin		Streptozocin
Hydroxycarbamide	Cytarabine ≤1g/m^2	Ifosfamide <2g/m^2	Daunorubicin ≥50mg/m^2	
Ipilimumab 1mg/m^2	Dabrafenib	Irinotecan	Doxorubicin ≥60mg/m^2	
Melphalan PO	Dasatinib	Irinotecan liposomal	Epirubicin <90mg/m^2	
Methotrexate PO	Daunorubicin liposomal	Ixabepilone	Estramustine	
Nivolumab	Decitabine	Lenvatinib	Idarubicin	
Obinutuzumab	Dexrazoxane	Methotrexate (100-250mg/m^2)	Ifosfamide 2-3g/m^2	
Ofatumumab	Docetaxel		Lomustine	
Pembrolizumab	Doxorubicin liposomal	Mifamurtide	Melphalan IV>100mg/m^2	
Pixantrone	Elotuzumab	Mitoxantrone		
Pomalidomide	Eribulin	Oxaliplatin	Methotrexate >250mg/m^2	
Pralatrexate	Etoposide ≤120mg/m^2	Raltitrexed		
Ramucirumab	Everolimus	Temozolamide	Thiotepa	
Rituximab	Fludarabine	Teniposide	Vinorelbine PO	
Ruxolitinib	Gemcitabine	Trabectedin		
Sorafenib	Gemtuzumab	Treosulfan		

Trastuzumab	Ibrutinib	Trifluoridine-Tipiracil (Lonsurf®)		
Vemurafenib	Idelalisib			
Vinblastine	Inotuzumab			
Vincristine	Ipilimumab >1mg/m^2	Vinorelbine PO		
Vinorelbine IV	Isatuximab			
Vismodegib	Ixabepilone			
	Ixazomib	**Moderate - High Orals**		
	Lapatinib	Abemaciclib		
	Lenalidomide	Bosutinib		
	Mercaptopurine (6-MP)	Imatinib		
	Methotrexate(<100mg/m^2)	Lenvatinib		
	Mitomycin C (MMC)	Midostaurin		
	Mitoxantrone	Niraparib		
	Necitumumab	Olaparib		
	Nelarabine	Ribociclib		
	Nilotinib	Rucaparib		
	Nivolumab			
	Osimertinib			
	Paclitaxel			
	Paclitaxel-albumin (Abraxane®)			
	Palbociclib			
	Panitumumab			
	Panobinostat			
	Pazopanib			
	Pegaspargase			
	Pembrolizumab			
	Pemetrexed			
	Pentostatin			
	Pertuzumab			
	Ponatinib			
	Regorafenib			

Minimal (<10%)	Low (10-30%)	Moderate (30-60%)	High (60-90%)	Very High (>90%)
	Sunitinib			
	Tagraxofusp			
	Tegafur uracil			

	Temsirolimus		
	Thalidomide		
	Thiotepa		
	Tioguanine		
	Topotecan		
	Trabectedin		
	Trametinib		
	Trastuzumab Emtansine (Kadcyla®)		
	Tretinoin (ATRA)		
	Valrubicin		
	Vandetanib		
	Venetoclax		
	Vindesine		
	Vinflunine		
Minimal - Low			
Acalabrutinib			
Afatinib			
Alectinib			
Alpelisib			
Apalutamide			
Asciminib			
Brigatinib			
Darolutamide			
Encorafenib			
Gilteritinib			
Glasdegib			
Ivosidenib			
Lorlatinib			
Nintedanib			
Pemigatinib			
Selpercatinib			
Sotorasib			
Tepotinib			
Tivozanib			

Topotecan		
Trifluridine/Tipiracil (Lonsurf®)		
Tucatinib		
Zanubrutinib		

Route Parenteral Oral IV or Oral

β Arsenic trioxide should not be given with other medications with affect the QT interval. The preferred antiemetic for arsenic trioxide is cyclizine.

Emetic potential for combination SACT regimens (This list is not exhaustive):

Tumour type	Regimen	Risk of Emesis
Breast	CMF	High
	EC	High
	FEC100	Very High
	TAC	High
	TCH	High
CNS	PCV	High
Colorectal	FOLFIRI	Moderate
	FOLFOX (OxMdG)	High
	FOLFOXIRI	High
	Mitomycin/Fluorouracil	Low-Moderate
	Modified de Gramont (MdG)	Low
	XELOX/CAPOX	High
Gynae	Carboplatin/Liposomal Doxorubicin	High
	Carboplatin/Paclitaxel	High
	Cisplatin/Etoposide	Very high
Haematology	ABVD	Very High
	CHOP	High
	CODOX-M	High
	CVP	Moderate
	ESHAP	High
	FC	Moderate
	IVE	Very High
	Mini-BEAM	Very High

Tumour type	Regimen	Risk of Emesis
	IVAC	Very High
	R-CHOP	High
	R-CVP	Moderate
Head & Neck	TPF	Very High
Lung	Carboplatin/Etoposide	High
	Carboplatin/Gemcitabine	High
	Carboplatin/Pemetrexed	High
	Carboplatin/Pemetrexed/Pembrolizumab	High
	Cisplatin/Etoposide	Very High
	Cisplatin/Pemetrexed	Very High
	Cisplatin/Vinorelbine	Very High
Sarcoma	Doxorubicin/Cisplatin VIDE	Very High
Upper GI	Cisplatin/Fluorouracil	Very High
	Cisplatin/Gemcitabine	Very High
	FOLFIRINOX	High
	Mitomycin/Fluorouracil	Low-Moderate
Urology	BEP	Very High
	Cisplatin/Gemcitabine TIP	Very High

Radiation-induced nausea and vomiting:

Principles of Management

As for SACT induced nausea and vomiting, the goal of antiemetic therapy is to prevent-or minimise the severity and duration of-nausea and vomiting.

The risk of radiation-induced emesis varies with the treatment administered.

Determinants of emetic risk

- The determinants of emetic risk in relation to radiotherapy are as follows:
- The actual treatment field
- The dose of radiotherapy administered per fraction
- The pattern of fractionation

Guidance for patients receiving chemo-radiation

For patients receiving chemo-radiation, treat with antiemetic therapy according to the highest emetogenic risk based on the SACT regimen or the radiotherapy treatment field. In the case of cisplatin-based chemoradiation, this should include a 3-drug regimen including a 5-HT3 receptor antagonist, dexamethasone and fosaprepitant/aprepitant.

Guidance for patients receiving radiotherapy without SACT

Prophylactic antiemetics are not usually required for treatments to the head and neck (outside of the brain), upper thorax, breast, extremities, and localised prostate. However, a prophylactic 5-HT3 antagonist antiemetic should be considered when pituitary/hypothalamus/ sphenoid are within IMRT fields (e.g. maxillary sinus, ethmoid sinus, nasopharynx).
For the spinal fields, consider a stat dose of 5-HT3 antagonist plus domperidone/ metoclopramide PRN (large field) or regular domperidone/metoclopramide alone (smaller fields).

Risk Level	**Irradiated Area**	**Pre-radiotherapy antiemetic - 1 hour before each fraction**	**Antiemetic breakthrough**
Minimal Risk (<10%)	Extremities Breast	No prophylactic antiemetics are routinely recommended but consider issuing: Domperidone 10mg tds PO PRN ***OR*** Metoclopramide 10 tds PO PRN ***OR*** Cyclizine 50mg PO/IV PRN	Commence with 1st level antiemetics for breakthrough nausea and vomiting. Treat on subsequent fractions as moderately emetogenic.
Low (10-30%)	Lower thorax region and pelvis. palliative posterior spine fields at the level of T12/L1		
Moderate (30-90%)	Upper abdomen hemibody irradiation, upper abdomen abdominal-pelvic, mantle and craniospinal irradiation. Lower oesophagus and cranial radiosurgery.	5-HT_3 antagonist e.g. Ondansetron 8mg PO/IV ***OR*** Granisetron 1-2mg PO/IV ***AND*** Domperidone 10mg tds PO PRN ***OR*** Metoclopramide 10 tds PO PRN ***OR*** Cyclizine 50mg PO/IV PRN ***AND/OR CONSIDER*** Dexamethasone 8mg PO/IV	Commence with 2nd level antiemetics for breakthrough nausea and vomiting. Treat on subsequent fractions as highly emetogenic.
High (>90%)	Total Body Irradiation (TBI) Cranial Stereotactic Radiosurgery Single 10 Gy to palliative lung with	5-HT_3 antagonist e.g. Ondansetron 8mg PO/IV ***OR*** Granisetron 1-2mg PO/IV ***AND***	Commence with 2nd level antiemetics for breakthrough nausea and vomiting. Continue for 24 hours after

Risk Level	Irradiated Area	Pre-radiotherapy antiemetic - 1 hour before each fraction	Antiemetic breakthrough
	bronchial obstruction.	Dexamethasone 8mg PO/IV ***AND*** Domperidone 10mg tds PO PRN ***OR*** Metoclopramide 10 tds PO PRN ***OR*** Cyclizine 50mg PO/IV PRN	fraction

Guidance for breakthrough antiemetics for radiotherapy-induced nausea and vomiting

Refer to 'Treatment of SACT induced breakthrough nausea and vomiting' above for details of recommended breakthrough antiemetics for radiotherapy-induced nausea and vomiting.

8.0 TRAINING/COMPETENCE REQUIREMENTS

There are no specific or mandatory training requirements required to read and implement this document although all prescribers and Allied Healthcare Professionals (AHPs) should refer and adhere to its guidance whenever prescribing or administering antiemetics.

9.0 MONITORING

Note - The monitoring arrangements are required for any Trust Policy. This can also be used as an option for other types of documents.

Element of policy for monitoring	Section	Monitoring method - Information source (e.g. audit)/ Measure / performance standard	Item Lead	Monitoring frequency /reporting frequency and route	Arrangements for responding to shortcomings and tracking delivery of planned actions
All	**All**	Incident monitoring	EC	As required	Incident monitoring/Cytotoxic Pharmacy Group meetings

10.0 ABBREVIATIONS

AC	Anthracycline-Cyclophosphamide
AHP	Allied Healthcare Professionals
ASCO	American Society of Clinical Oncology
CPI	Checkpoint Inhibitor(s)
ESMO	European Society of Medical Oncology
HCS	HOPE (Haematology, Oncology & Palliative Care Executive) and Clinical Support
IV	Intravenous
IVN	Intravenous Nutrition (aka Total Parenteral Nutrition (TPN))
MASCC	Multinational Association of Supportive Care in Cancer
N&V	Nausea and Vomiting
OP	Original Pack
PO	Oral
SACT	Systemic Anti-Cancer Treatment
SC	Subcutaneous
SL	Sublingually

11.0 REFERENCES

Ensure only current references of source literature for the document are used. List the key references first, such as national guidance or legislation.

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9.15 Thames Valley NHS “Antiemetic Guidelines for the Prophylaxis of Chemotherapy and Radiotherapy Induced Nausea & Vomiting in Adults”. September 2019. TVCN blank document (tvscn.nhs.uk)

9.16 Twycross, Wilcock & Howard (2014). Palliative Care Formulary. Fifth Edition. www.palliativedrugs.com.

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12.0 APPENDIX A – ACTION OF ANTIEMETICS ON MAIN RECEPTOR SITES

Drug	D_2 Antagonist	H_1 Antagonist	ACh Antagonist	5-HT_2 Antagonist	5-HT_3 Antagonist	5-HT_4 Antagonist	NK-1 Inhibitor
Akynzeo®	++	+		++	+++		+++
Aprepitant							+++
Cyclizine		++	++				
Domperidone	++						
Fosaprepitant							+++
Granisetron					+++		
Haloperidol	+++				+/-		
Hyoscine Hydrobromide			+++				
Levomepromazine	++	+++	++	+++			
Metoclopramide	++				+	++	
Olanzapine	++	+	++	++	+		
Ondansetron					+++		
Prochlorperazine	+++	++	+	+/++			

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

13.0 APPENDIX B – ANTIEMETIC INFORMATION – Refer to BNF/SmPC for more information

Drug / Drug Group	Comments
5-HT_3 antagonist	Patients may complain of constipation and headaches. Patients need to be advised accordingly, e.g. laxido +/- senna +/- docusate sodium to relieve constipation and paracetamol to relieve headache. If severe, consider an alternative antiemetic. Ondansetron is available in orodispersible tablet or as a suppository. Granisetron is available as a transdermal patch. Treatment should be switched to granisetron should a patient develop migraine symptoms whilst receiving ondansetron. Palonosetron is a long-acting 5-HT_3 antagonist which is associated with a lower incidence of constipation than other 5-HT_3 antagonists. It is currently non-formulary although may be given alongside netupitant (Akynzeo®)
Aprepitant and **Fosaprepitant**	Aprepitant and Fosaprepitant are NK-1 receptor antagonists 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 & dexamethasone and inhibits both the acute and delayed phases of cisplatin-induced emesis. When given in combinations with corticosteroids, the SmPC 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.
Akynzeo®	Akynzeo® is a combination of netupitant (NK-1 antagonist) and Palonosetron (5-HT_3 antagonist). See above for further information relating to both antiemetics.
Cannabinoids	Evidence for the benefit of medicinal cannabinoids is somewhat limited although has recently been recommended by NICE to treat intractable nausea or vomiting. Only nabilone is currently licensed in the UK and is listed under Schedule 2 of the Misuse of Drugs Regulations 2001.
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 pro-kinetics such as domperidone or metoclopramide as they will theoretically antagonise one another. Cyclizine should be infused slowly to reduce the risk of infusion-related reactions.
Dexamethasone/	Corticosteroids can cause sleep disturbances, hyperactivity and excessive appetite.

Prednisolone	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. Contra-indicated in cardiac diseases where cardiac conduction is, or could be, impaired. The maximum daily dose is 10mg tds.
Haloperidol	Avoid or use smaller dose in renal impairment. Possible risk of causing extrapyramidal symptoms.
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). Antiemetic use as adjunct rather than single agent recommended. May be given sublingually for more rapid effect.
Metoclopramide	Can rarely cause agitation or the development of extra-pyramidal symptoms particularly in 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. Maximum dose 30 mg in 24 hours (10mg tds).
Olanzapine	Traditionally used as an anti-psychotic medication but has been shown to be effective in reducing incidence of chemotherapy induced nausea and vomiting. Available as orodispersible tablet.
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. Available to use buccally as Buccastem 3-6mg BD.