



All chemotherapy side effects can lead to delays or cessation of treatment. Prompt management or prevention of side effects leads to improved patient outcomes. Chemotherapy side effects are influenced by factors such as the drug regimen, stage of disease, and a patient's co-morbidities and psychosocial status. The most common side effects of chemotherapy are listed in this fact sheet.

Oral anticancer therapy

The number of patients receiving oral anticancer therapy in an outpatient or community setting has increased in recent years. Oral chemotherapy includes cytotoxic agents and targeted therapies.

Like parenteral chemotherapy, oral medicines cause adverse effects and are associated with an increased risk of medication errors; particularly if non-specialists prescribe, dispense or administer these oral medicines and bypass the normal safeguards used for injectable anticancer medicines.

Oral chemotherapy can cause life-threatening side effects, such as neutropenic sepsis and diarrhoea. As such, it is important for patients and their carers to recognise the potential complications associated with their treatment, and the necessary actions to be taken. GPs play an important role in this education for patients.

! Please read:

- *Caution with oral chemotherapy for cancer.* By the Victorian Department of Health: Information for community health professionals, 2010
- *Safe use of oral cytotoxic medicines.* By Carrington C. Australian Prescriber Volume 36: Number 1, Feb 2013
- *Oral anti-cancer medicines: Rapid response report.* By the National Patient Safety Agency, January 2008

Complications associated with cancer treatments

In the event of toxicity, patients receiving anticancer therapy (either orally or via a continuous intravenous pump) should have their treatment withheld or pumps disconnected while advice is being sought.

Side effect	Onset	Drug	Tumour
Nausea and vomiting	Acute within 1–3 days Delayed within 7 days	• Cytotoxics	• All
Febrile neutropenia	Typically 7–14 days post chemotherapy	• Cytotoxics	• All
Severe diarrhoea	During chemotherapy and within days/weeks of a cycle	• Fluorouracil (5FU); more common with continuous infusion • Capecitabine (oral chemotherapy) • Irinotecan • Ipilimumab	• Breast • GI • Colorectal • Melanoma
Cardiotoxicity (arrhythmia, coronary artery spasm, prolonged QT, heart failure)	During treatment	• Fluorouracil (5FU); more common with continuous infusion • HER2-directed therapies (e.g. trastuzumab, trastuzumab emtansine and pertuzumab) • Anthracyclines • Tyrosine kinase inhibitors (e.g. sunitinib, lapatinib, erlotinib, dabrafenib, etc.)	• Breast • Lung • GI • Melanoma • Renal
Hypocalcaemia	During treatment	• Bone-modifying agents (e.g. denosumab, zoledronic acid, pamidronate) • Aromatase inhibitors (e.g. anastrozole, letrozole, exemestane)	• Breast / prostate / myeloma
Acneiform rash	Within 2–4 weeks	• Epidermal growth factor receptor (EGFR) inhibitors (e.g. erlotinib, gefitinib, cetuximab, panitumumab)	• Lung • GI
Plantar-palmar hyperkeratosis	Median onset 8 weeks	• BRAF inhibitors (e.g. dabrafenib, vemurafenib)	• Melanoma
Palmar-plantar erythrodysesthesia/hand-foot syndrome	During treatment	• Fluorouracil (5FU); more common with continuous infusion • Capecitabine (oral chemotherapy) • Tyrosine kinase inhibitors (e.g. sunitinib, sorafenib)	• Breast • GI • Renal/hepatic

Adapted from the Royal College of Physicians: *Acute care toolkit 7: Oncology, October 2013*

Chemotherapy-induced nausea and vomiting (CINV)

Nausea and vomiting are the most common and distressing side effects of chemotherapy. If poorly managed, they can lead to non-compliance with treatment and metabolic imbalance with a decline in overall performance status.

The recommended anti-emetics for each chemotherapy protocol are listed on eviQ.

The different types of CINV (anticipatory, acute, delayed, breakthrough and refractory) require different interventions. Refer to the link on the right for a list of commonly-used antiemetics.

! Please read:

- [eviQ document: Prevention of chemotherapy induced nausea and vomiting](#)

i Patient information:

- [Fact sheet: Nausea and vomiting during cancer treatment](#)

Mucositis

Patients may present with mild redness, which can quickly progress to painful ulceration in a short timeframe. Patients receiving combination chemotherapy and radiation are at a higher risk of mucositis. Preventative measures, such as regular mouth care, close monitoring and early intervention, can help to alleviate this side effect. Women may develop vaginal mucositis.

Severe mucositis can affect the patient's ability to eat, drink and even talk. Admission to hospital may be required if the patient is unable to drink. Such patients may be at an increased risk of aspiration.

Mucositis involving mouth ulcers can be related to, or indicative of, neutropenia. If the patient is generally unwell and the timeframe is within 7–14 days post chemotherapy, consider neutropenic sepsis.

! Please read:

- [eviQ document: Oral mucositis assessment tool](#)
- [eviQ document: Oral mucositis](#)

i Patient information:

- [Fact sheet: Mouth care problems during cancer treatment](#)

Neutropenic sepsis

GPs should suspect neutropenic sepsis in patients having cancer treatment who become unwell or develop a fever. Neutropenic patients **may not** present with the classic signs of infection and may deteriorate very rapidly.

PLEASE NOTE: Neutropenic sepsis is a life-threatening toxicity and should be treated as a MEDICAL EMERGENCY. Patients can deteriorate rapidly and die within hours. Patients should be advised of the risks and what to do if they develop symptoms.

Many cytotoxic regimens cause myelosuppression. The most common timeframe for this to occur is 7–14 days post chemotherapy. Neutropenic patients do not mount a normal immunological response to infection. As such, it is important to treat any symptoms with suspicion and refer them to hospital urgently. Prompt action reduces the risk of death from neutropenic sepsis.

Patients at greater risk:

- Those with haematological malignancy
- Those currently on high-dose steroids or on long-term oral anticancer therapy
- The elderly or frail
- Those who have had previous anticancer therapy
- Those who have a previous history of neutropenic sepsis
- Those with a central venous access device (e.g. PICC/Hickman line/port)

Management of suspected neutropenic sepsis

Patients with suspected neutropenic sepsis should be treated promptly with broad-spectrum antibiotics to prevent deterioration into septic shock. Therefore, all patients who develop fevers or become unwell during chemotherapy should be instructed to present to a healthcare facility for rapid assessment and management.

In circumstances when immediate presentation to a treating healthcare facility or local hospital is not possible, broad-spectrum antibiotics should be administered within 60 minutes, allowing time for the initial investigations to be performed.

Antibiotic treatment should not be delayed, pending the results of any investigations.

Empiric antibiotics

- Beta lactam monotherapy using piperacillin with tazobactam should be offered as initial empiric antibiotic therapy, unless there are patient-specific or local microbiological contraindications. Cefepime can be administered if the patient has a known penicillin allergy.
- An aminoglycoside (e.g. gentamicin) should not be offered, either as monotherapy or in dual therapy, for the initial empiric treatment of suspected neutropenic sepsis, unless there are patient-specific or local microbiological indications.

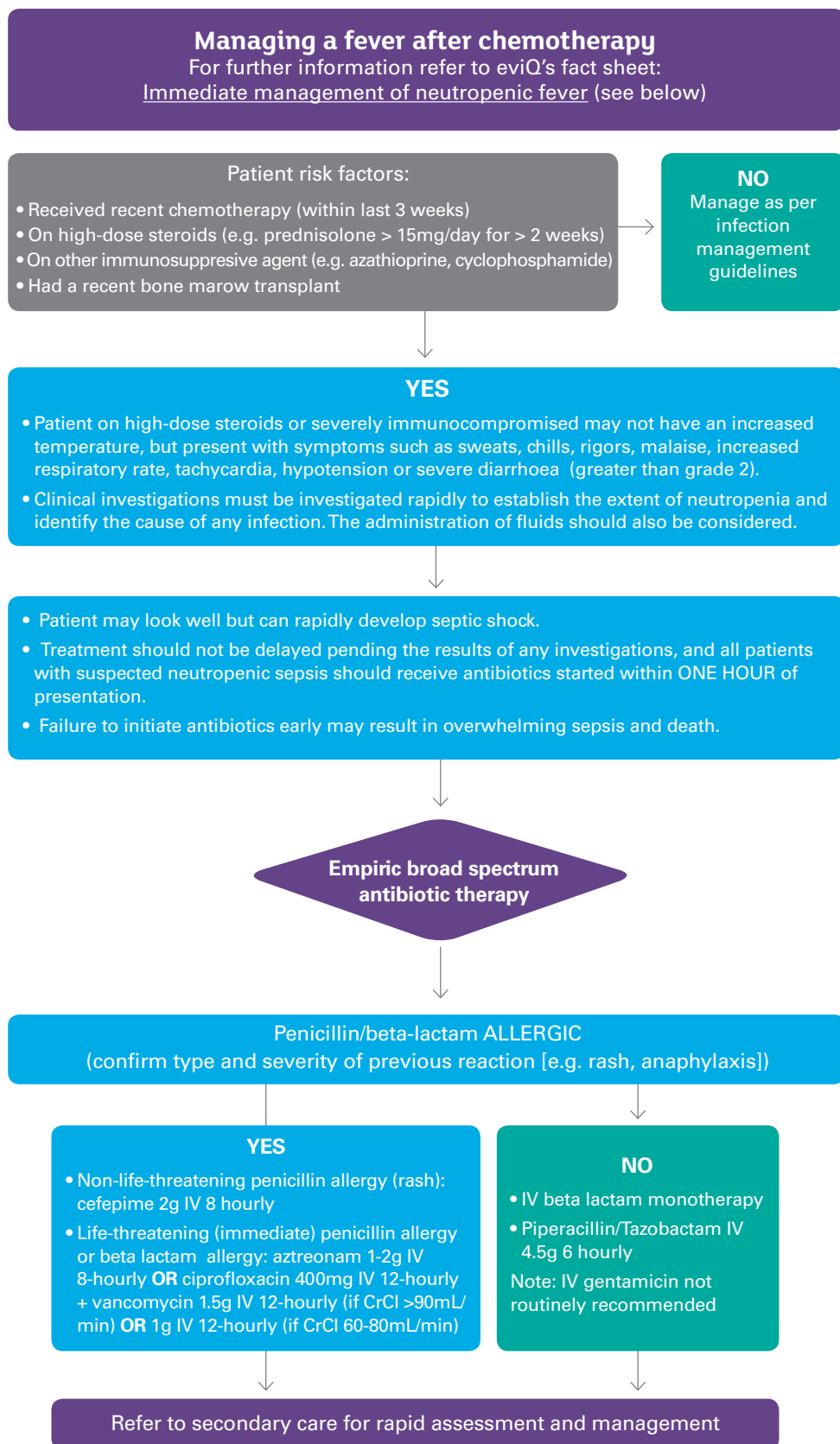
! Please read:

- [eviQ document: Immediate management of neutropenic fever](#)

i Patient information:

- [Fact sheet: Infection during cancer treatment](#)

Refer to the algorithm below for managing a patient who presents with a fever, post chemotherapy, and has suspected neutropenic sepsis.



Diarrhoea

PLEASE NOTE: Hypovolaemic shock and subsequent death has been known to occur following chemotherapy-induced diarrhoea.

Nearly all anticancer drugs have the potential to cause diarrhoea. With some drugs, such as irinotecan, diarrhoea can be a life-threatening complication of treatment. Immediate management is crucial, so it is important to know the drugs your patient has received.

The following drugs that require specific management and referral to a treating hospital for further management:

- **Irinotecan:** Used in the treatment of colorectal cancer, this can cause life-threatening diarrhoea that requires urgent specific treatment.
- **Ipilimumab:** Used in the treatment of metastatic melanoma, requires specialist management by a health professional experienced in its use.

Other anticancer drugs that cause diarrhoea:

- Capecitabine
- Fluorouracil (5FU)
- Sorafenib
- Sunitinib
- Lapatinib

Please read:

- [eviQ document: Treatment-induced diarrhoea](#)
- [eviQ document: Algorithm - management of treatment-induced diarrhoea](#)

Peripheral neuropathy

Peripheral neuropathy is a common complication of several classes of anticancer drugs, including taxanes, platinum-based compounds, vinca alkaloids, and some drugs that are used to treat multiple myeloma.

These drugs cause inflammation, injury or degeneration of the peripheral nerve fibre(s), resulting in sensory, motor or cranial nerve dysfunction. Most treatment-related peripheral neuropathy is transient; however, some drugs can cause permanent dysfunction. As such, it is important that patients know the symptoms of this side effect and report them, as a treatment dose modification may be required. Prompt treatment of any injury to an affected body part will reduce the likelihood of complications.

Please read:

- [eviQ document: Peripheral neuropathy](#)

Patient information:

- [eviQ document: Chemotherapy-induced peripheral neuropathy](#)

Common side effects associated with cancer treatment are:

- Acneiform rash (papulopustular rash) associated with epidermal growth factor receptor (EGFR) inhibitors
- Alopecia
- Anaemia
- Constipation
- Fatigue
- Hand-foot syndrome (HFS) – Palmar-plantar erythrodysesthesia (PPE), associated with chemotherapeutic agents
- Laryngopharyngeal dysaesthesia
- Lymphoedema
- Neutropenia
- Oesophagitis
- Oral mucositis
- Osteonecrosis of the jaw
- Taste and smell changes
- Thrombocytopenia

Working together to lessen the impact of cancer

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