Chemotherapy Protocol

MESOTHELIOMA

CARBOPLATIN (AUC6)-PEMETREXED

Regimen

- Mesothelioma – Carboplatin (AUC6)-Pemetrexed

Indication

- First line therapy of advanced pleural mesothelioma where the disease is not suitable for surgical resection
- WHO Performance status 0, 1
- Palliative intent

Toxicity

Drug	Adverse Effect
Carboplatin	Neuropathy, thrombocytopenia
Pemetrexed	Diarrhoea, skin reactions, neuropathy

The adverse effects listed are not exhaustive. Please refer to the relevant Summary of Product Characteristics for full details.

Monitoring

Disease

- A baseline chest x-ray should be performed before starting treatment and up to date (ideally within 1 month) cross section imaging should also be performed

Regimen

- FBC, LFTs and U&Es before each cycle
- A chest x-ray should be performed before each cycle

Dose Modifications

The dose modifications listed are for haematological, liver and renal function only. Dose adjustments may be necessary for other toxicities as well.

In principle all dose reductions due to adverse drug reactions should not be re-escalated in subsequent cycles without consultant approval. It is also a general rule

for chemotherapy that if a third dose reduction is necessary treatment should be stopped.

Please discuss all dose reductions / delays with the relevant consultant before prescribing, if appropriate. The approach may be different depending on the clinical circumstances. The following is a general guide only.

Haematology

Prior to prescribing cycle one the following treatment criteria must be met;

Criteria	Eligible Level
Neutrophil	Greater than or equal to $1.5x10^9$/L (unless due to bone marrow impairment)
Platelets	Greater than or equal to $100x10^9$/L (unless due to bone marrow impairment

Consider blood transfusion if patient symptomatic of anaemia or has a haemoglobin of less than 8g/dL

Subsequently if the neutrophils are less than 1.5 $x10^9$/L then in the first instance delay treatment for 7 days. If counts recover at this point continue at the initial dose. If counts remain low continue with treatment using a 20% dose reduction. If the myelosuppression recurs despite this dose reduction stop treatment.

If the platelets are less than $100x10^9$/L then in the first instance delay treatment for 7 days. If the counts recover at this point continue at the initial dose. If the counts still fall within this range continue using a 20% dose reduction. If the platelet level falls below $50x10^9$/L reduce the dose by 50%.

Hepatic Impairment

Drug	Recommendation
Carboplatin	No dose reduction necessary
Pemetrexed	Clinical decision

Renal Impairment

Drug	Dose (% of original dose)
Carboplatin	Significant changes in GFR (of more than 10%) may require dose adjustment Do not administer if the CrCl is less than 20ml/min
Pemetrexed	If the creatinine clearance falls below 45ml/min consider dose reduction

Regimen

The starting dose of carboplatin AUC 6 is used with calculated GFR. AUC 5 may be considered with EDTA clearance, seek advice from the appropriate consultant before prescribing. The recommended maximum dose when using a calculated creatinine clearance at AUC5 is 900mg (creatinine clearance 125ml/min). This is not a dose included in the national dose banding table. The maximum dose has been set at 890mg in ARIA. Please check if this dose is appropriate. If you have an obese patient or an individual with a calculated creatinine clearance above 125ml/min please seek advice from the relevant consultant.

It should be noted that the dose of carboplatin may need to be altered if there is a change (improvement or reduction) in renal function of more than 10% from the previous cycle

21 day cycle for 3-6 cycles (6 cycles are set in Aria)

Drug	Dose	Days	Administration
Carboplatin	AUC6 (max 890mg dose)	1	Intravenous infusion in 500ml glucose 5% over 60 minutes
Pemetrexed	500mg/m^2	1	Intravenous infusion in 100ml glucose 5% or sodium chloride 0.9% over 10 minutes

Dose Information

- Carboplatin will be dose banded in accordance with the national dose bands (10mg/ml)
- The maximum dose of carboplatin for AUC 6 is 900mg. This will be set as 890mg in ARIA to comply with national dose bands.
- It should be noted that the dose of carboplatin may need to be altered if there is a change (improvement or reduction) in renal function of more than 10% from the previous cycle.
- Pemetrexed will be dose banded in accordance with the national dose bands

Administration Information

- Carboplatin should be administered 30 minutes after the end of the pemetrexed infusion
- Pemtrexed may be administered in 100ml of either glucose 5% or sodium chloride 0.9% over 10 minutes. The choice of fluid will be dependent on the product stocked by pharmacy. The fluid and volume will not appear in the prescription but can be located in the instructions notepad

Extravasation

- Carboplatin – irritant
- Pemetrexed - inflammitant

Additional Therapy

- Folic acid 5mg once daily starting 1 – 2 weeks prior to and continuing for three weeks after the last dose of pemetrexed.
- Hydroxocobalamin intramuscular injection 1mg every three months starting 1 – 2 weeks prior to pemetrexed.
- Antiemetics

  15-30 minutes prior to chemotherapy;

  - ondansetron 8mg oral or intravenous bolus

  Ensure the patient has taken oral dexamethasone starting the day before pemetrexed. On the occasions where individuals attend for treatment and have forgotten to take the dexamethasone pre-medication administer an intravenous bolus dose of dexamethasone 20mg.

  As take home medication;

  - dexamethasone 4mg twice a day oral for 3 days starting the day before chemotherapy is due.

  - metoclopramide 10mg three times a day when required

- Gastric protection with a proton pump inhibitor or H_2 antagonist may be considered in patients considered at high risk of GI ulceration or bleed
- Prophylactic antibiotics can be considered if required

Additional Information

- Consider draining pleural or peritoneal effusions prior to pemetrexed administration

References
1.National Institute of Clinical Excellence (2009). TA135 Pemetrexed for the treatment of mesothelioma. London: DOH.
2.Santoro A, O'Brien ME, Stahel RA et al. Pemetrexed plus cisplatin or pemetrexed plus carboplatin for chemonaive patients with malignant pleural mesothelioma: results of the International Expanded Access Programme. J Thorac Oncol 2008; 3 (7): 756 – 763.

REGIMEN SUMMARY

Carboplatin (AUC6)-Pemetrexed

Cycle 1, 2, 3, 4, 5

Day Minus One

1. Dexamethasone 4mg twice a day oral*

Day One

2. Dexamethsone 4mg twice a day oral (from TTO)*

3. Ondansetron 8mg oral or intravenous bolus
   Administration Instructions
   Administer 15-30 minutes prior to SACT. This may be given as ondansetron 8mg IV stat if required.

4. Pemetrexed 500mg/m^2 intravenous infusion in 100ml glucose 5% or sodium chloride 0.9% over 10 minutes

5. Carboplatin AUC6 intravenous infusion in 500ml glucose 5% over 60 minutes (start 30 minutes after the end of the pemetrexed infusion)
Administration Instructions
Start 30 minutes after the end of the pemetrexed infusion
The dose of carboplatin is capped at a creatinine clearance of 125ml/min. The internationally recommended maximum dose of carboplatin for AUC 6 is 900mg. The national dose bands do not contain this dose so the cap has been set at 890mg in ARIA. Please check this dose is appropriate for your patient.

Take Home Medicines

6. Dexamethasone 4mg twice a day oral for 3 days starting the day before the pemetrexed infusion*

7. Metoclopramide 10mg three times a day when required oral
   Administration Instructions
   When required for the relief of nausea. Please supply five days or an original pack as appropriate

8. Folic acid 5mg once daily oral

Cycle 6

Day Minus One

9. Dexamethasone 4mg twice a day oral*

Day One

10. Dexamethsone 4mg twice a day oral (from TTO)*

11. Ondansetron 8mg oral or intravenous bolus
    Administration Instructions
    Administer 15-30 minutes prior to SACT. This may be given as ondansetron 8mg IV stat if required

12. Pemetrexed 500mg/m^2 intravenous infusion in 100ml glucose 5% or sodium chloride 0.9% over 10 minutes

13. Carboplatin AUC6 intravenous infusion in 500ml glucose 5% over 60 minutes (start 30 minutes after the end of the pemetrexed infusion)

Administration Instructions

Start 30 minutes after the end of the pemetrexed infusion

The maximum dose of carboplatin at AUC 6 is 900mg (creatinine clearance 125ml/min). This has been set at 890mg in ARIA to comply with national dose bands

Take Home Medicines

14. Metoclopramide 10mg three times a day when required oral

Administration Instructions

When required for the relief of nausea. Please supply five days or an original pack as appropriate

15. Folic acid 5mg once daily oral

Hydroxocobalamin will not be included as part of the Aria regime and must be prescribed separately on the cycle for which it is due.

* In Aria Planner the dexamethasone 4mg twice daily will appear on days 1, 2, 3 of treatment. This is the supply for the next cycle. The patient should have been given the supply for cycle one in the pre-assessment or consent clinic. The administration instructions reflect this.

DOCUMENT CONTROL

Version	Date	Amendment	Written By	Approved By
1.5	Feb 2023	Max carboplatin dose added to regimen table	Alexandra Pritchard Pharmacist	Tom Hurst Pharmacy Technician
1.4	Aug 2022	Carboplatin national dose bands added	Dr Deborah Wright Pharmacist	Donna Kimber Pharmacy Technician
1.3	Jan 2016	Pemetrexed administration changed throughout the text	Dr Deborah Wright Pharmacist	Donna Kimber Pharmacy Technician
1.2		Header changed to NHS badge AUC6 added to name and “and” replaced with dash Adverse effects put in table and toxicity removed Dose modification tabulated Renal and hepatic function tabulated Carboplatin paragraph amended under regimen Clarification added on the number of cycles set in Aria Regimen tabulated Twice daily changed to twice a day Regimen name added to summary Summary re-numbered Metoclopramide dose changed to 10mg Cycle 6 added with dexamethasone pre-medication removed Document control tabulated Hospital representation and disclaimer added	Dr Deborah Wright Pharmacist	Debra Robertson Pharmacist
1.1	Sept 2010	Font changed to Arial Header altered to include “Strength through Partnership” Drug names given capitals in regimen Extravasation moved to under Administration Information Administration Information added Footer changed to include regimen name and review date removed Standard paragraph added to	Dr Deborah Wright Pharmacist	Donna Kimber Pharmacy Technician

		introduction in dose modifications Dose modifications format (not information changed) Dose information added to reflect super user agreements Granisetron removed from antiemetics Coding added Summary page added Document control added		
1	Jan 2010	None	Dr Deborah Wright Pharmacist	Dr Andrew Bates Consultant Clinical Oncologist Dr Tim Gulliford Consultant Medical Oncologist

This chemotherapy protocol has been developed as part of the chemotherapy electronic prescribing project. This was and remains a collaborative project that originated from the former CSCCN. These documents have been approved on behalf of the following Trusts;

Hampshire Hospitals NHS Foundation Trust
NHS Isle of Wight
Portsmouth Hospitals NHS Trust
Salisbury Hospitals NHS Foundation Trust
University Hospital Southampton NHS Foundation Trust
Western Sussex Hospitals NHS Trust

All actions have been taken to ensure these protocols are correct. However, no responsibility can be taken for errors which occur as a result of following these guidelines.