CARBOplatin (AUC5) and Etoposide 100mg/m^2 Therapy-21 day

INDICATIONS FOR USE:

INDICATION	ICD10	Regimen Code	Reimbursement Status
Small cell lung cancer (SCLC) extensive disease	C34	00271a	Hospital

TREATMENT:

The starting dose of the drugs detailed below may be adjusted downward by the prescribing clinician, using their independent medical judgement, to consider each patients individual clinical circumstances.

CARBOplatin is administered on day 1 and etoposide is administered on three consecutive days (Days 1-3) of a 21day cycle for 4-6 cycles or until disease progression or unacceptable toxicity develops. Facilities to treat anaphylaxis MUST be present when the chemotherapy is administered.

Order of Admin	Day	Drug	Dose	Route and Method of Administration	Diluent & Rate	Cycle
1	1	CARBOplatin	AUC 5	IV infusion	500ml glucose 5% over 60 min	Every 21 days
2	1-3	Etoposide	100mg/m^2	IV Infusion	1000ml 0.9% NaCl over 60mins	Every 21 days

CARBOplatin dose:

The dose in mg of CARBOplatin to be administered is calculated as follows:

Dose (mg) = target AUC (mg/ml x min) x (GFR ml/min +25)

- **Measured GFR** (e.g. nuclear renogram) is preferred whenever feasible.
- **Estimation of GFR (eGFR)** can be done by using the Wright formula or using the Cockroft and Gault formula to measure creatinine clearance.
- The GFR used to calculate the AUC dosing should not exceed 125ml/min.
- For obese and anorexic patients the formulae may not give accurate results and measured GFR is recommended. Where obesity or overweight is likely to lead to an overestimate of GFR and isotope GFR is not available the use of the adjusted ideal body weight for Cockroft and Gault may be considered (5).

WRIGHT FORMULA

There are two versions of the formula depending on how serum creatinine values are obtained, by the kinetic Jaffe method or the enzymatic method. The formula can be further adapted if covariant creatine kinase (CK) values are available (not shown).

1. *SCr measured using enzymatic assay*.

$$\text{GFR (ml/min)} = \frac{(6230 - 32.8 \times \text{Age}) \times \text{BSA} \times (1 - 0.23 \times \text{Sex})}{\text{SCr (micromol/min)}}$$

2. *SCr measured using Jaffe assay*

$$\text{GFR (ml/min)} = \frac{(6580 - 38.8 \times \text{Age}) \times \text{BSA} \times (1 - 0.168 \times \textit{Sex})}{\text{SCr (micromol/min)}}$$

Key: Sex = 1 if female, 0 if male; Age in years; BSA= DuBois BSA

COCKCROFT-GAULT FORMULA

$$\text{GFR (ml/min)} = \frac{S \times (140 - \text{age in years}) \times \text{wt (kg)}}{\text{serum creatinine (micromol/L)}}$$

S= 1.04 for females and 1.23 for males

ELIGIBILTY:

- Indications as above
- Patients unsuitable for treatment with CISplatin based regimens
- ECOG 0-2 (0-3 in patients < 70)

EXCLUSIONS:

- Hypersensitivity to CARBOplatin, etoposide or any of the excipients
  Pregnancy or breast feeding

PRESCRIPTIVE AUTHORITY:

The treatment plan must be initiated by a Consultant Medical Oncologist

TESTS:

Baseline tests:

- FBC, renal and liver profile

Regular tests:

- FBC weekly prior to treatment
- Renal and liver profile prior to each cycle

Disease monitoring:

Disease monitoring should be in line with the patient's treatment plan and any other test/s as directed by the supervising Consultant.

DOSE MODIFICATIONS:

- Any dose modification should be discussed with a Consultant.

Haematological:

Table 1: Dose modifications for haematological toxicity on Day 1

ANC ($x10^9$ /L)		Platelets ($x10^9$ /L)	Dose
$\geq$ 1.5	**and**	$\geq$ 100	100%
< 1.5	**and**	< 100	Delay one week or until recovery
<0.5 for > 5days or neutropenic fever			Consider dose reduction for etoposide

Renal and Hepatic Impairment:

Table 2: Dose modification of CARBOplatin and etoposide in renal and hepatic impairment

Drug	Renal Impairment		Hepatic Impairment			
CARBOplatin	• Patients with creatinine clearance values of <60ml/min are at greater risk to develop myelosuppression. • In case of GFR ≤ 20ml/min CARBOplatin should not be administered at all. • If Cockroft & Gault or Wright formula are used, the dose should be adjusted per cycle based on a serum creatinine obtained within 48 hrs of drug administration. • If isotope GFR is used, the dose should remain the same provided the serum creatinine is ≤110% of its value at the time of the isotope measurement. If the serum creatinine is higher than this, consideration should be given to remeasuring the GFR or to recalculating using Cockroft & Gault or Wright formulae taking care this does result in a dose reduction		Probably no dose modification required			
Etoposide	**CrCl (ml/min)**	**Dose**	**Bilirubin (micromol/L)**		**AST (Units/L)**	**Dose Etoposide**
	>50	100%	26-51	or	60-180	50%
	15-50	75%	>51	or	>180	Clinical decision
	<15	50%				
	Subsequent dosing should be based on patient tolerance and clinical effect.					

SUPPORTIVE CARE:

EMETOGENIC POTENTIAL:

CARBOplatin High
Etoposide Low (**Refer to local policy).**

PREMEDICATIONS:

None usually required unless patient has experienced a previous hypersensitivity reaction.

OTHER SUPPORTIVE CARE: No specific recommendations

ADVERSE EFFECTS / REGIMEN SPECIFIC COMPLICATIONS:

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

- **Neutropenia**: Fever or other evidence of infection must be assessed promptly and treated appropriately.
- **Neurotoxicity and ototoxicity:** Neurological evaluation and an assessment of hearing should be

performed on a regular basis, especially in patients receiving high dose CARBOplatin. Neurotoxicity, such as parasthesia, decreased deep tendon reflexes, and ototoxicity are more likely seen in patients previously treated with CISplatin, other platinum treatments and other ototoxic agents. Frequency of neurologic toxicity is also increased in patients older than 65 years.

- **Hypersensitivity:** High risk with etoposide and CARBOplatin. Hypersensitivity risk increases with number of cycles of CARBOplatin.

DRUG INTERACTIONS:

- Avoid concurrent use of CARBOplatin with nephrotoxic drugs (e.g. aminoglycosides, furosemide, NSAIDS) due to additive nephrotoxicity. If necessary monitor renal function closely.
- Avoid concurrent use of CARBOplatin with ototoxic drugs (e.g. aminoglycosides, furosemide, NSAIDS). If necessary perform regular audiometric testing.
- CYP3A4 inducers may increase the clearance of etoposide.
- CYP3A4 and p-gp inhibitors may decrease the clearance of etoposide
- Current drug interaction databases should be consulted for more information.

ATC CODE:

CARBOplatin	L01XA02
Etoposide	L01CB01

REFERENCES:

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10. Etoposide 20 mg/ml Concentrate for Solution for Infusion Summary of Product Characteristics. HPRA Last updated: 29/07/2019 Accessed November 2019 Available at: https://www.hpra.ie/img/uploaded/swedocuments/Licence_PA2059-036-001_29072019103821.pdf
11. NCCP Classification Document for Systemic Anti-Cancer Therapy (SACT) Induced Nausea and Vomiting. V1 2018. Available at: https://www.hse.ie/eng/services/list/5/cancer/profinfo/chemoprotocols/nccp%20antiemetic%20classification%20document%20v1%202018.pdf

Version	Date	Amendment	Approved By
1			Dr Maccon Keane
2	06/12/2017	Updated with new NCCP regimen template. Title amended to include dose. Emetogenic status CARBOplatin amended from moderate to moderate to high	Prof Maccon Keane
3	20/11/2019	Reviewed. Standardisation of treatment table and renal dose modifications. Update of emetogenic potential.	Prof Maccon Keane

Comments and feedback welcome at oncologydrugs@cancercontrol.ie.