**Indication**
First line therapy with concurrent radiotherapy for patients with muscle invasive bladder cancer. WHO performance status 0-1 only.

Patients may have received 3 cycles of neo-adjuvant chemotherapy.

**ICD-10 codes**
Codes pre-fixed with C67

**Regimen details**

<table>
<thead>
<tr>
<th>Day</th>
<th>Drug</th>
<th>Dose</th>
<th>Route</th>
</tr>
</thead>
<tbody>
<tr>
<td>1, 8, 15 and 22</td>
<td>Gemcitabine</td>
<td>100 mg/m²</td>
<td>IV infusion</td>
</tr>
</tbody>
</table>

**Cycle frequency**
Weekly for 4 weeks with concurrent radiotherapy.

**Number of cycles**
1 cycle
As above

**Administration**
Gemcitabine is administered in 250mL sodium chloride 0.9% over 30 minutes, 2-4 hours prior to radiotherapy.

Gemcitabine is a known radio-sensitizer. Patients should be carefully monitored for gastrointestinal toxicity.

**Pre-medications**
Nil

**Emetogenicity**
This regimen has low emetic potential.

**Additional supportive medication**
Antiemetics as per local guidelines.

**Extravasation**
Gemcitabine – neutral (Group 1)

**Investigations – pre first cycle**

<table>
<thead>
<tr>
<th>Investigation</th>
<th>Validity period (or as per local practice)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FBC</td>
<td>7 days</td>
</tr>
<tr>
<td>U+E (including creatinine)</td>
<td>7 days</td>
</tr>
<tr>
<td>LFTs</td>
<td>7 days</td>
</tr>
</tbody>
</table>
Investigations - pre subsequent cycles

<table>
<thead>
<tr>
<th>Investigation</th>
<th>Validity period (or as per local practice)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FBC</td>
<td>Weekly, valid for 24 hours</td>
</tr>
<tr>
<td>U+E (including creatinine)</td>
<td>Weekly, valid for 24 hours</td>
</tr>
<tr>
<td>LFTs</td>
<td>Weekly, valid for 24 hours</td>
</tr>
</tbody>
</table>

**Standard limits for administration to go ahead**
If blood results not within range, authorisation to administer **must** be given by prescriber/consultant

<table>
<thead>
<tr>
<th>Investigation</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neutrophils</td>
<td>≥1.0 x 10⁹/L</td>
</tr>
<tr>
<td>Platelets</td>
<td>≥100 x 10⁹/L</td>
</tr>
<tr>
<td>Creatinine Clearance (CrCl)</td>
<td>≥30 mL/min</td>
</tr>
<tr>
<td>Bilirubin</td>
<td>&lt; 1.5 x ULN</td>
</tr>
</tbody>
</table>

**Dose modifications**
- **Haematological toxicity**
  If neutrophils < 1.0 x 10⁹/L or platelets <100 x 10⁹/L, omit gemcitabine but consider giving dose when counts recovered.

- **Renal impairment**
  If CrCl < 30mL/min omit gemcitabine.

- **Hepatic impairment**
  There is limited information about use of gemcitabine in hepatic impairment, therefore use with caution. AST elevations do not appear to cause dose limiting toxicity. If bilirubin > 1.5 x ULN consider omitting gemcitabine.

- **Other toxicities**
  If any ≥ grade 3 toxicity (particularly bowel or bladder) gemcitabine should be stopped. There are no circumstances for gemcitabine dose modification. Radiotherapy should continue to a full course and only be discontinued at the clinician’s discretion. If chemotherapy is withheld due to unacceptable toxicity, it should not be recommenced.

*Gemcitabine should be discontinued at the first sign of microangiopathic haemolytic anaemia (such as rapidly falling haemoglobin with concomitant thrombocytopenia, elevated bilirubin, creatinine, blood urea nitrogen or LDH. Renal failure may not be reversible with discontinuation of therapy, dialysis may be required.

**Adverse effects** - for full details consult product literature/ reference texts
- **Serious side effects**
  Interstitial pneumonitis, ARDS
  Cardiotoxicity
  Hepatotoxicity
  Myelosuppression
  Infertility
  Haemolytic uraemic anaemia/ microangiopathic haemolytic anaemia *

- **Frequently occurring side effects**
  Nausea and vomiting
  Myelosuppression
  Mucositis, stomatitis
  Diarrhoea, constipation
Oedema
Proteinuria
Haematuria
Flu-like symptoms

- **Other side effects**
  - Raised transaminases
  - Alopecia (mild)
  - Headache
  - Fatigue

**Significant drug interactions** – for full details consult product literature/ reference texts

**Warfarin/coumarin anticoagulants:** increased or fluctuating anticoagulant effects. Avoid if possible, consider switching patient to a low molecular weight heparin during treatment or if the patient continues taking warfarin monitor the INR at least once a week and adjust dose accordingly.

Gemcitabine is a radiosensitiser.

**Additional comments**

**References**

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