Chemotherapy –
Safe preparation and administration

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Chemotherapy

- Cytotoxic drugs (antineoplastic, anticancer or cancer chemotherapy drugs) include a wide range of chemical compounds.
- Because of their ability to kill tumor cells by interfering with cell division, they are extensively used to treat cancer, and some have other medical applications.
- However, their actions are not specific to tumor cells and normal cells may also be damaged.
Safety
Be alert

• Drug preparation
• Drug administration
• Handling patient waste
• Transport and waste disposal
• Cleaning spills.

http://www.hse.gov.uk/healthservices/safe-use-cytotoxic-drugs.htm
• The toxicity of cytotoxic drugs means, that they can present significant risks to those who handle them
• Occupational exposure can occur when control measures are inadequate
• Exposure may be through skin contact, skin absorption, inhalation of aerosols and drug particles, ingestion and needle stick injuries

http://www.hse.gov.uk/healthservices/safe-use-cytotoxic-drugs.htm
Employees handling cytotoxic drugs must be given suitable and sufficient information, instruction and training that is relevant to their work.
• Use good hygiene practices
• Provide suitable welfare facilities, eg prohibiting eating, drinking and smoking in areas where drugs are handled
• Provide washing facilities
• Provide training to all staff members who may be involved in handling cytotoxic drugs or cleaning areas likely to be contaminated
Effective protection will only be obtained if the personal protective equipment (PPE) chosen is:

- suitable for the task
- suited to the wearer and environment
- compatible with other PPE in use
- in good condition
- worn correctly.
First aid

- First aid equipment at hand (eye wash)
- Spill kit for cleaning
Suitable containers, clearly labelled and reserved only for the use of cytotoxic drug waste, should be available. Sharps containers should be used for the safe disposal of needles etc.
Each institution administering high dose CT in the context of HSCT must establish a quality management system for administration of this therapy.

Such a system must be established in close cooperation with the institutional pharmacy and the nursing team.

Conditioning has to be based on pre-printed orders.

Regular check points at different levels and immediately prior to administration have to safeguard that the right patient is given the specified drugs at the correct dose and appropriate timing.
• All check points include the “4 eyes” principle

→ at least two people must witness or approve a certain activity

www.ehealthinnovation.org
• Two patient identifiers
• Drug names
• Drug dose
• Drug volume
• Route of administration
• Rate of administration
• The calculation for dosing (including the variables used in this calculation)

Neuss et al. 2013
Getting ready

- Follow the protocol
- Use aseptic technique
- Antiemetic
- Double check medication (prescription, dosage)
- Line is working
- Bolus/infusion
- “Closed system”
Patient

- Information
- Follow up
- RR, pulse etc
- Weight
- (measure urine)
- Vomiting
- Allergic reaction
“Extravasation is the process by which any liquid (fluid or drug) accidentally leaks into the surrounding tissue. In terms of cancer therapy, extravasation refers to the inadvertent infiltration of chemotherapy into the subcutaneous or subdermal tissues surrounding the intravenous or intra-arterial administration site.”

Perez Fidalgo et al 2012
<table>
<thead>
<tr>
<th>Local skin reactions</th>
<th>Chemical phlebitis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspariginase</td>
<td>Amsacrin</td>
</tr>
<tr>
<td>Cisplatin</td>
<td>Carmustin</td>
</tr>
<tr>
<td>Daunorubicin</td>
<td>Cisplatin</td>
</tr>
<tr>
<td>Doxorubicin</td>
<td>Dacarbazaine</td>
</tr>
<tr>
<td>Epirubicin</td>
<td>Epirubicin</td>
</tr>
<tr>
<td>Fludarabine</td>
<td>5-Fluorouracil</td>
</tr>
<tr>
<td></td>
<td>(as continual infusion in combination with cisplatin)</td>
</tr>
<tr>
<td>Mechlorethamin</td>
<td>Mechlorethamine</td>
</tr>
<tr>
<td>Melphalan</td>
<td>Gemcitabine</td>
</tr>
<tr>
<td></td>
<td>Vinorelbin</td>
</tr>
</tbody>
</table>

Perez Fidalgo et al 2012
• Stop and disconnect infusion. Do not move the cannula
• Identify extravasated agent
• Specific measures
• Identify the area

Perez Fidalgo et al 2012
If something goes wrong?
<table>
<thead>
<tr>
<th>Top 10 cytotoxic errors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missing or incorrect prescription of antiemetics</td>
</tr>
<tr>
<td>Incorrect prescription of cytotoxic drug</td>
</tr>
<tr>
<td>Drug not prescribed and/or ordered from pharmacy</td>
</tr>
<tr>
<td>Incorrect administration</td>
</tr>
<tr>
<td>Patient has not taken prescribed medication</td>
</tr>
<tr>
<td>Incorrect dose verification</td>
</tr>
<tr>
<td>Correct regime was missing or incomplete</td>
</tr>
<tr>
<td>Errors related to the electric prescription software</td>
</tr>
<tr>
<td>Leakage from the infusion bags/pumps</td>
</tr>
<tr>
<td>Prescription both manually and electronically not matching</td>
</tr>
</tbody>
</table>
Wrong patient/drug/dosage….

- Act immediately – stop infusion
- Inform physician
- Patient! Information for parents

- Make an inquiry on the PROCESS
- Look for weak points on the process and don’t punish the individual
- Change the procedure, increase education if needed
Take home message

Protect the staff, patient and environment

Prepare and administer drugs safely, if you don’t have a protocol, write it and follow

If something goes wrong – act immediately – make an inquiry to avoid the same error

“Creating environments where people will express their concerns and speak up is a key factor in safety”  
“Patient safety and Quality”
References


Health and safety executives http://www.hse.gov.uk/index.htm


L. Sharp 2014 Overcoming medication errors in cancer care. EONS 9

Patient Safety and Quality 2008: S. Lacey; J. B. Smith; K. Cox. Pediatric safety and quality. An Evidence-based handbook for nurses, Vol. 1

Thank you!