Infusion of HPC (Haematopoietic Progenitor Cells)

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Objectives:

- Discuss the procedure of HPC infusion including premedication, patient consent, checking of cells
- Responsibilities in administering blood products
- Thawing of HPC
- Infusion technique
- Adverse reactions
Transplant at Liverpool Hospital
BMT Coordinator role

- Two admissions per week (2 Autologous or 1 Allo + 1 Auto)
- One HPC infusion per day
- Patient - Education/Obtain consent, pre admission
- Pharmacy – Timing of Melphalan
- Ward Nurses – Double staffing/post handover/accredited
- BMT Laboratory – other procedures/collections/staffing
- BMT Registrar – Available on ward
- Formulate protocol – checked by Consultant, Pharmacy, BMT Laboratory staff
Dimethylsulfoxide (DMSO) & Pre Medication

Cells are mixed with
- 50% v/v 0.9% sodium chloride
- 20% DMSO is a preservative which prevents cell death during freezing
- 30% Albumex

Maintains cell integrity, allows slow freezing

• Cells are transferred in to the freeze bags
Infusion of Thawed HPC
Autologous Allogeneic
Day of Infusion

Ward staff must check the transplant trolley the morning of infusion

<table>
<thead>
<tr>
<th>Trolley to be stocked with the following equipment at all times</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Medications</strong></td>
</tr>
<tr>
<td>5 x IV Metoclopramide 10 mg/2mL</td>
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<tr>
<td>5 x IV Ondansetron  8 mg/4mL</td>
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<tr>
<td>5 x IV Promethazine  50 mg/2mL</td>
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<tr>
<td>5 x IV Hydrocortisone 100 mg</td>
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<tr>
<td>5 x IV Hyoscine butylbromide (eg Buscopan 20 mg/1mL)</td>
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<tr>
<td>5 x Heparinised Saline 50 u/5mL</td>
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<tr>
<td>2 x IV Calcium Gluconate 2.2mmol/10mL</td>
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<tr>
<td>Adrenalin 1mg/1mL</td>
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<tr>
<td>Atropine Sulphate 5 x 1mg/5ml</td>
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<tr>
<td><strong>Consumables &amp; Equipment</strong></td>
</tr>
<tr>
<td>5 x 30mL luer lock Syringes</td>
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<tr>
<td>5 x 10mL 0.9% sodium chloride for injection</td>
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<tr>
<td>Micropore</td>
</tr>
<tr>
<td>5 x 10mL syringe</td>
</tr>
<tr>
<td>5 x 5mL syringe</td>
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<tr>
<td>5 x 2mL syringe</td>
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<tr>
<td>20 x alcohol wipes</td>
</tr>
<tr>
<td>4 x Chlorhexidine swabs sticks</td>
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<tr>
<td>1 x Y line extension</td>
</tr>
<tr>
<td>1 x IV non-filtered giving set</td>
</tr>
<tr>
<td>2 x 3 way tap</td>
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<tr>
<td><strong>Extra equipment required on the day of infusion</strong></td>
</tr>
<tr>
<td>2 x dressing packs</td>
</tr>
<tr>
<td>2 x sterile gloves</td>
</tr>
<tr>
<td>1 x Hudson mask</td>
</tr>
<tr>
<td>1 x nasal prong set</td>
</tr>
<tr>
<td>5 x disposable emesis bags</td>
</tr>
<tr>
<td>3 x disposable underpads (Blueys)</td>
</tr>
<tr>
<td>5 x sterile gauze</td>
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</tbody>
</table>
Side Effects from DMSO

- Unpleasant taste, throat tickle, nausea, facial flushing, tachycardia, abdominal cramps, shortness of breath, allergic reaction, hypertension, hypotension, creamed corn breath, haematuria
- Pre medication – Loratidine and Paracetamol 60 minutes prior to infusion
- Ice chips, lollies
- Maximum 1g DMSO/kg/day
- Toxic to cells at room temperature
- Infused @ < 10 minutes per bag
Day of Infusion

**Before Infusion**

**BMT Laboratory**
- Check stem cell bags for integrity, patient details - Before patient begins chemotherapy & morning of infusion
- Send Consent for Transplant of Non-Conforming Product to Consultant for signing (if applicable)

**BMT Registrar**
- Assess patient
- Order stem cells, pre medications, IV fluids, check if antibiotics required post infusion
Day of Infusion

Before Infusion

**Ward Nursing Staff**

- Check transplant trolley
- Check stem cells, pre medications ordered, post infusion IV fluids & if antibiotics are to be given?
- Educate & Assess patient
- Ensure infusion equipment available
- Prime & attach IV line to largest lumen of Central line, ensure flow
- Baseline Observations
- Check O2
Responsibilities in administering blood products

- SWSLHD Administration of Blood Products SWSLHD_PD2018_002_INT
- Valid Consent
- Verify patient identification with patient & all procedural staff for every bag of HPC
  a) Patient wristband
  b) HPC Bag
  c) Product Infusion form
  d) Transplant Protocol
  e) Pink Intravenous Infusion form

If unconscious?
- What else do we need to check?
- BLOOD GROUP
Cells are thawed in a 37°C water bath after Ward Nurse has confirmed patient ready & observations are within their normal limits.

Cells removed from liquid nitrogen

Cells are transported to the ward
• 2 Accredited ward nurses – 1 for patient, 1 cell infusion
• Aseptic technique
• Free flow at fastest rate until stem cells reach patient then slowed briefly (5-10 seconds) then fastest rate
• 10 minute maximum flow time for each bag, monitored by Scientist
• Observations monitored after each bag is infused, if changes delay until normal rate resumes
• Scientist observes cell bag for clots to advise if anticoagulant required (extremely rare)
• Post infusion IV/Oral fluids/Monitoring
- HPC Bag lowered, N/Saline added to clean out then give remaining stem cells
- Bag rate may be slowed if patient experiencing side effects but bag must be completed, rest between
Recording

- Side effects during infusion & for the next 24 hours must be recorded as an OFI (Opportunity for Improvement) & noted by the BMT Registrar on the Product Infusion Form.
- If side effects during infusion become severe HPC bag must be kept for microbial testing.
- Ward Nurse must update Fluid Balance Chart.
Infusion of Fresh HPC

- No DMSO hence no pre medications
- Need to check if antibiotic cover is needed
- ABO mismatch – if major mismatch check ABO titres
- Volume