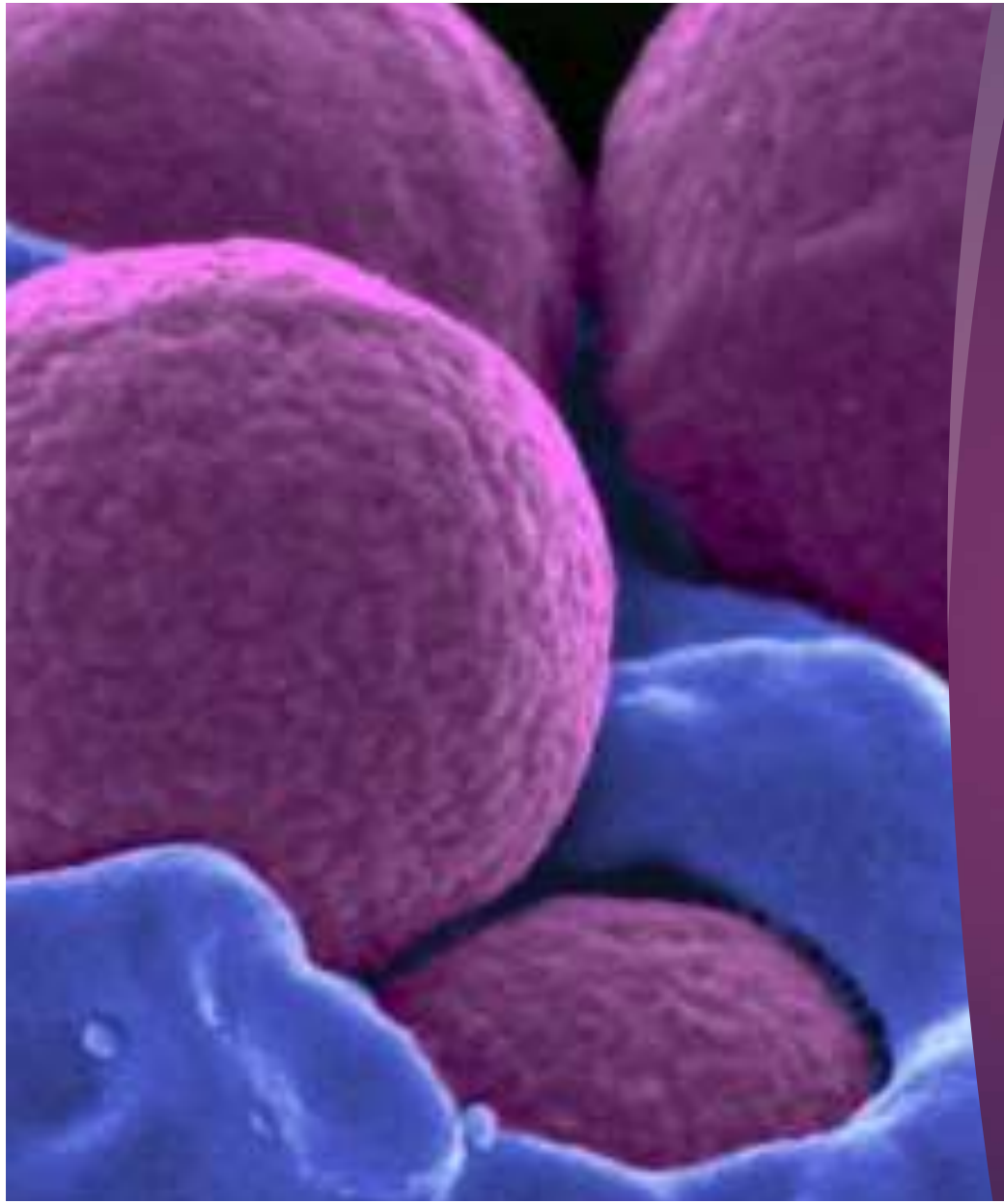


Chemotherapy Administration

LOUISE GILES

CNO SIG 2025

Learning Objectives

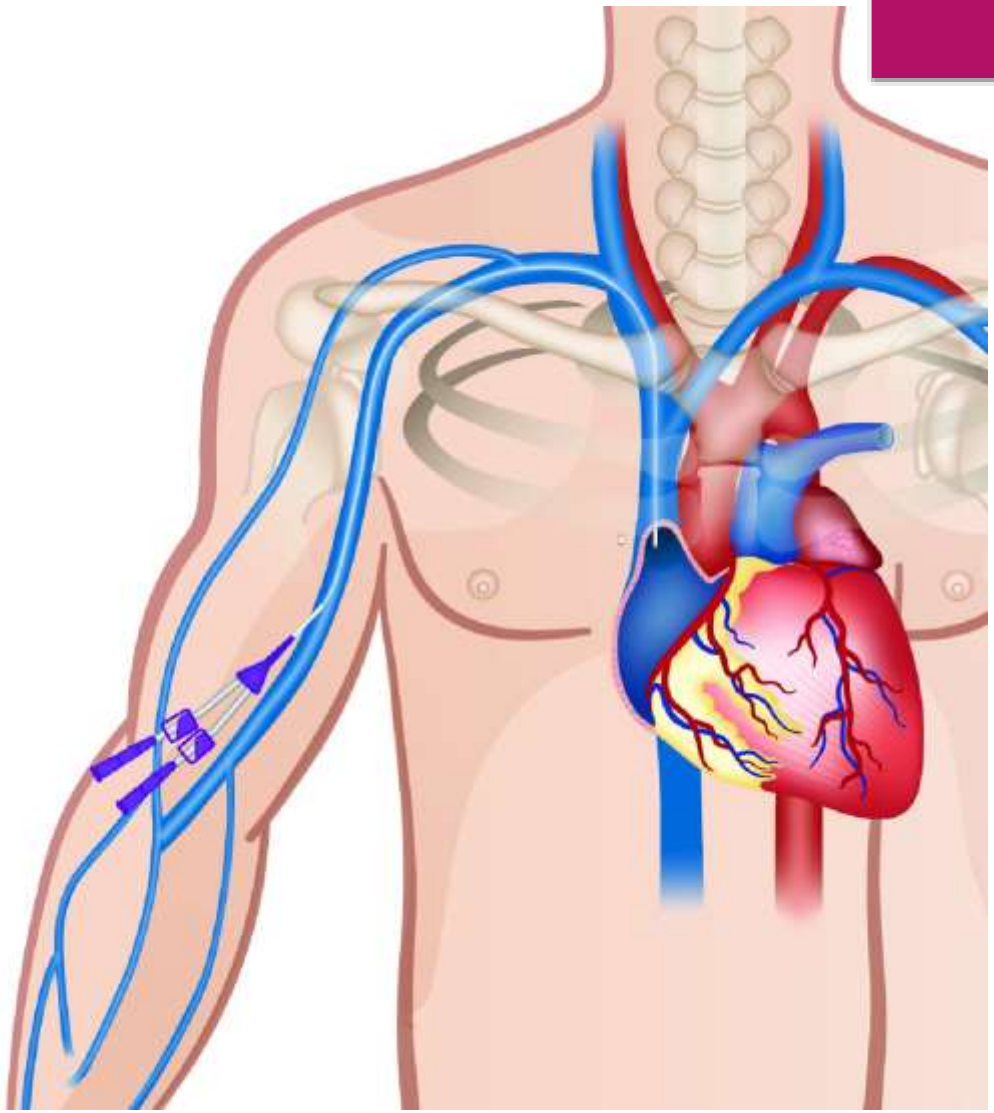
- Describe the routes used to administer chemotherapy
- Explain what venous access devices are used to administer IV chemotherapy and list some of the potential complications that can arise
- Recommend guidelines for safe handling of anticancer medications and advise for patients at home
- Recommend strategies for prevention and management of chemotherapy extravasation
- Explain what infusion/hypersensitivity reactions are and how these are managed
- Discuss the risk involved and safety precautions necessary when giving intrathecal chemotherapy

Chemotherapy routes

Intravenous	Oral	Sub cutaneous	Intrathecal
Intravesical (bladder)	Intraventricular (brain)	Intra or trans arterial (TACE)	Topical

Intravenous-vascular access

- Peripheral
- Central
  - PICC
  - Implanted ports (Powerport)
  - Hickman or Groshong (tunnelled)



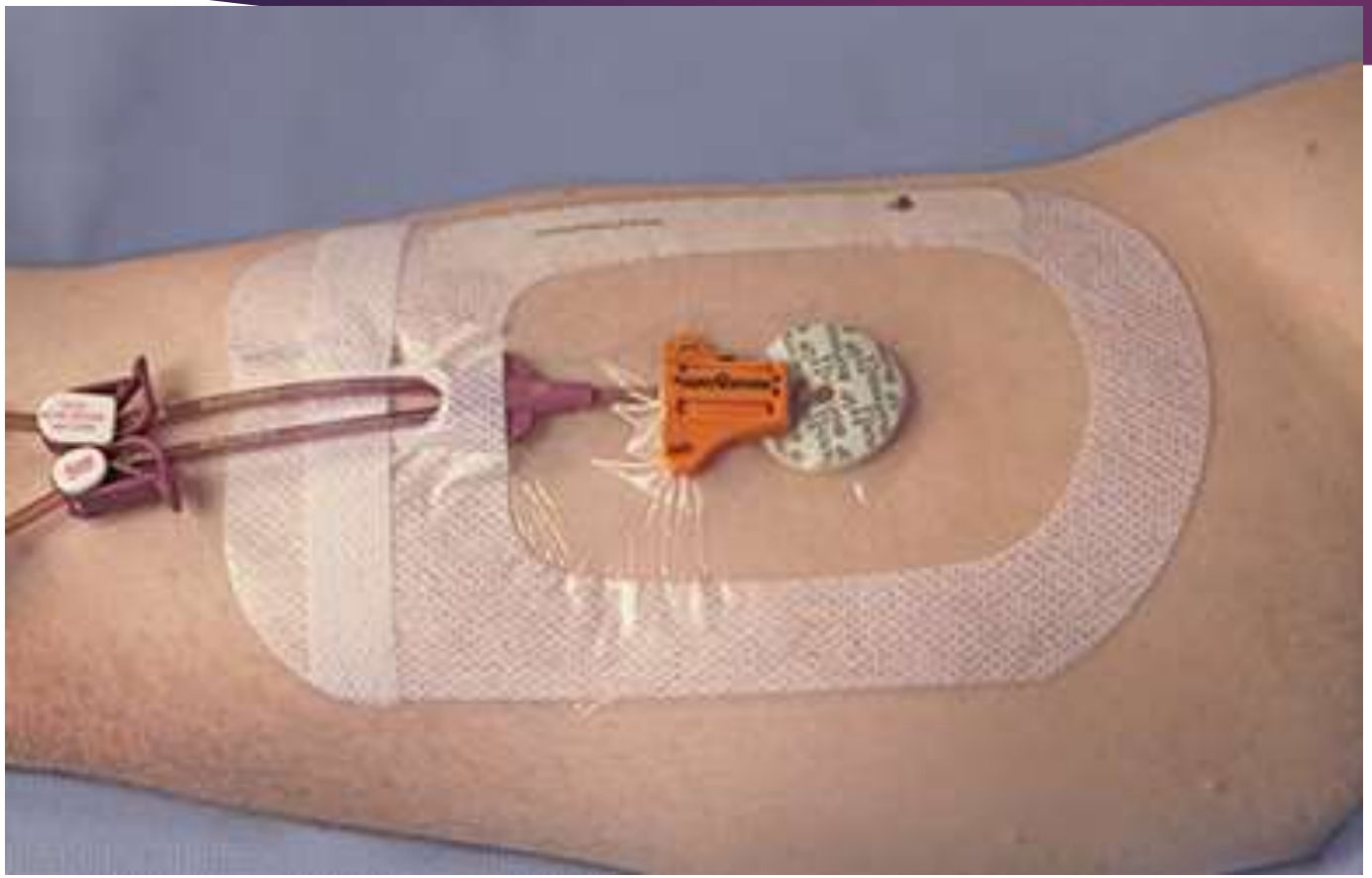
Risks of vascular access

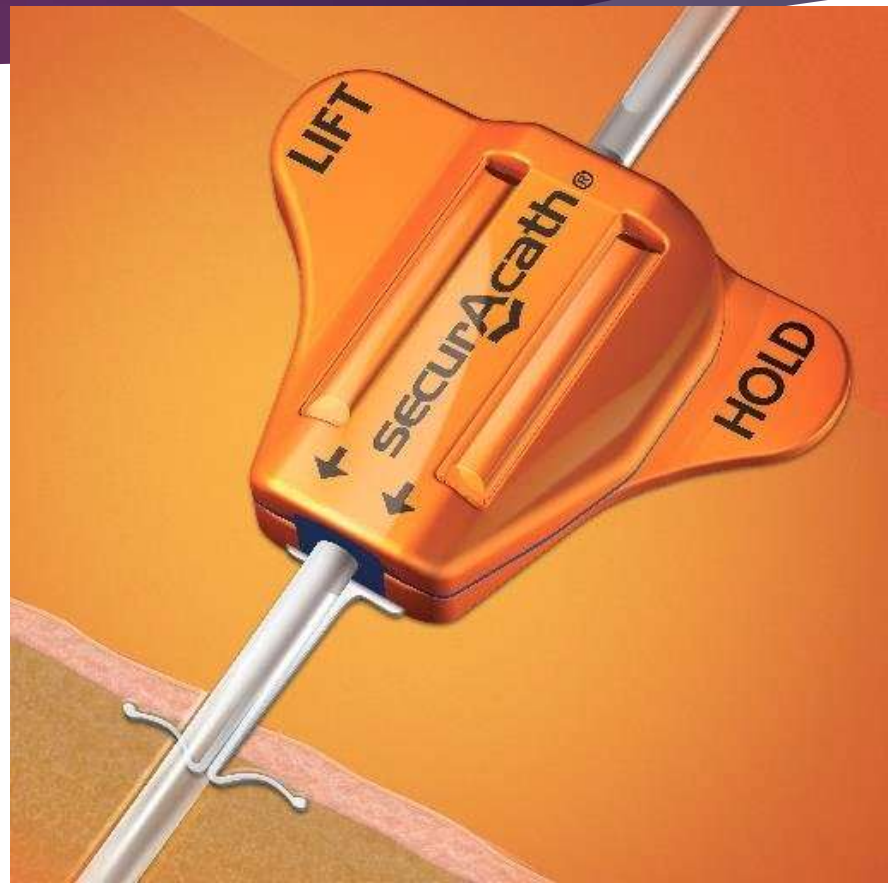
- Infection
- Bleeding
- DVT/Thrombophlebitis
- Mechanical Phlebitis
- Cellulitis/Contact Dermatitis
- Lymph tissue injury
- Occlusion
- Malposition/Dysfunction /Dislodged

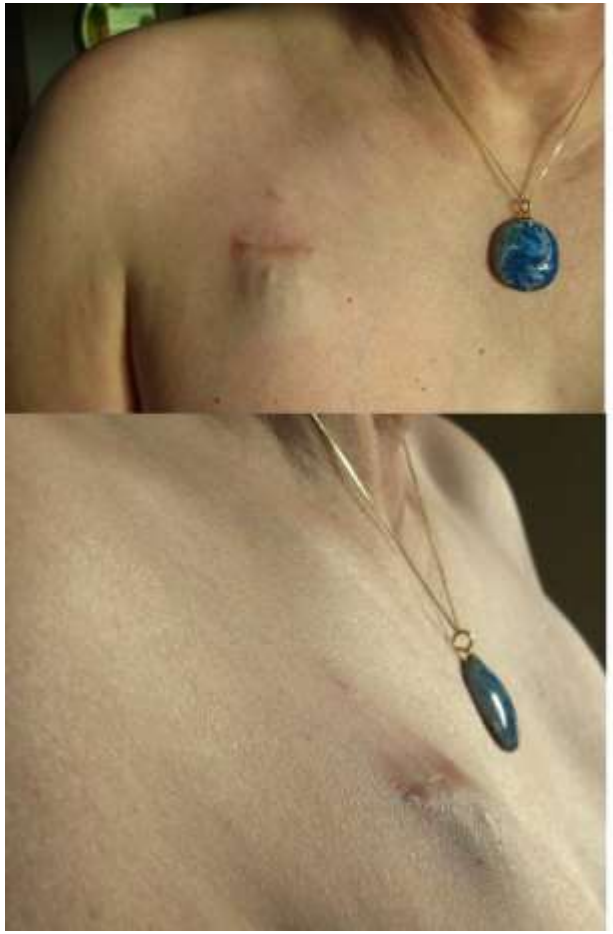
Infection

- Infection is one of the most frequent and serious complications associated with central-line catheters.
- Micro-organisms migrate from the skin down the catheter tract and colonise at the catheter tip.
- Most catheter-related bloodstream infections are bacterial but may also be fungal, especially in severely immunosuppressed patient
- Infection is potentially life-threatening esp. in immunosuppressed patients

PICC secured with Securacath







Bard Power Port Day 39

Implanted port

Safe handling of hazardous medications and related waste

Cytotoxic, hormonal, immunomodifiers, some antiviral and molecular targeted therapies

- Packed in a sealed, leak proof double bag, clearly labeled.
- Transported in a rigid walled, puncture resistant, leak proof container
- Personal Protective equipment
  - Gloves
  - Gown
  - Protective Eye wear (googles or shield)
  - Respiratory protective equipment (N95)

Handling hazaradous body fluids

Considered to be contaminated with chemotherapy up to 7 days after dose

PPE – Gloves, gowns, eye protection and mask

Dispose of soiled linen in purple cytotoxic waste bag

Be aware of location of cytotoxic spill kits and ask for help with spills

Advice for patients/whanau: precautions at home

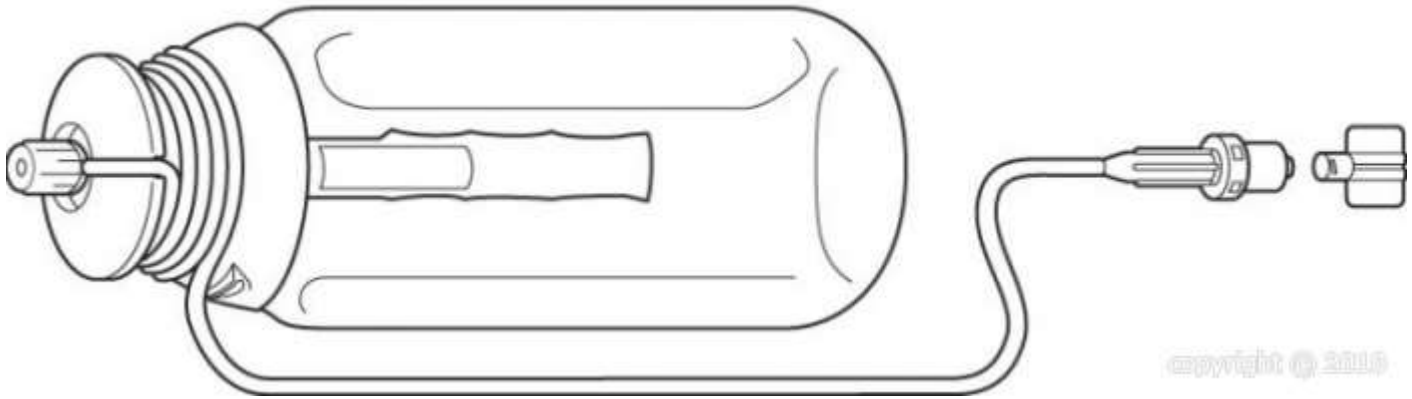
- Take precautions for 7 days after chemo
- Double flush toilet with closed lid
- Clean any spills with disposable cloths, then wash surfaces with soapy water
- ‘Double bag’ any contaminated items going in the rubbish
- Use condoms to protect partner
- Wash soiled items separately for 2 complete cycles in hot/warm water
- ALWAYS WASH YOUR HANDS

IV administration

- Bolus
- Short or medium (intermittent IV infusion)
- Continuous infusion

- Duration of administration of some cytotoxics important:
  - 5-FU
  - Cytarabine
  - Methotrexate

Elastomeric pump (5-FU)



Elastomeric pumps

- Flow rate is most accurate at 33.3 degrees
- Flow rate is +/- 10%
- Most accurate with glucose 5%
- Most accurate if luer lock and balloon are about the same height
- Other
  - Ensure CVC is patent
  - Ensure the line is not kinked
  - Check progression lines on outside of plastic housing

Extravasation

Inadvertent administration/leakage of cytotoxic drug from the vein into the surrounding tissues

- Vesicants –anthracyclines, vinca alkaloids
  - DNA binding
  - DNA non binding
- Irritants- taxanes
- Irritants with vesicant properties
- Neutral

Vesicants

DNA binding

- have a direct affect on the cell in healthy tissue when they are extravasated
- cause progressive tissue destruction as they bind to cellular DNA and recycle locally
- may cause skin blistering, ulcer formation and necrosis. Tissue destruction may extend into underlying tendons, ligaments, nerves, and bone which may require excision and skin grafting

daunorubicin, doxorubicin, epirubicin, idarubicin, mitomycin, amsacrine

Vesicants

DNA non-binding

- an indirect rather than a direct affect on the cell in healthy tissue when they are extravasated
- the type of injury that results is similar to a burn, is mildly to moderately painful and can result in ulceration
- normal tissue healing occurs within 3 to 5 weeks

vincristine, vinblastine, vinorelbine

Signs of extravasation

- patient complains of burning, stinging, pain or discomfort
- patient complains of thoracic pain
- evidence of swelling, oedema, erythema, leakage at the site
- absence of free flow of infusion
- change in infusion flow i.e. slow or sluggish
- loss of blood return or change in blood flow
- increase in resistance when administering IV bolus drugs

Treatment

- SLAP
  - Stop
  - Leave Vascular device in place
  - Aspirate
  - Plan

DMSO dimethylsulfoxide for DNA binding (anthracyclines) + cool pack

Hyaluronidase for DNA non-binding (vinca alkaloids) + warm pack

Pain relief as required

Acute infusion related reactions

Taxanes

Prevention

Paclitaxel: dexamethasone, H2 antagonists (famotidine) and antihistamines

Docetaxel: dexamethasone

Taxanes 95% of hypersensitivity reactions are in cycle 1 or 2.

Platinums (carboplatin, cisplatin)

Prevention

No premeds can prevent reaction

Treat -Longer duration of infusion 3 hrs + premeds.

Desensitisation or discontinue

Monoclonal antibody (Rituximab, Obinutuzumab)

Prevention

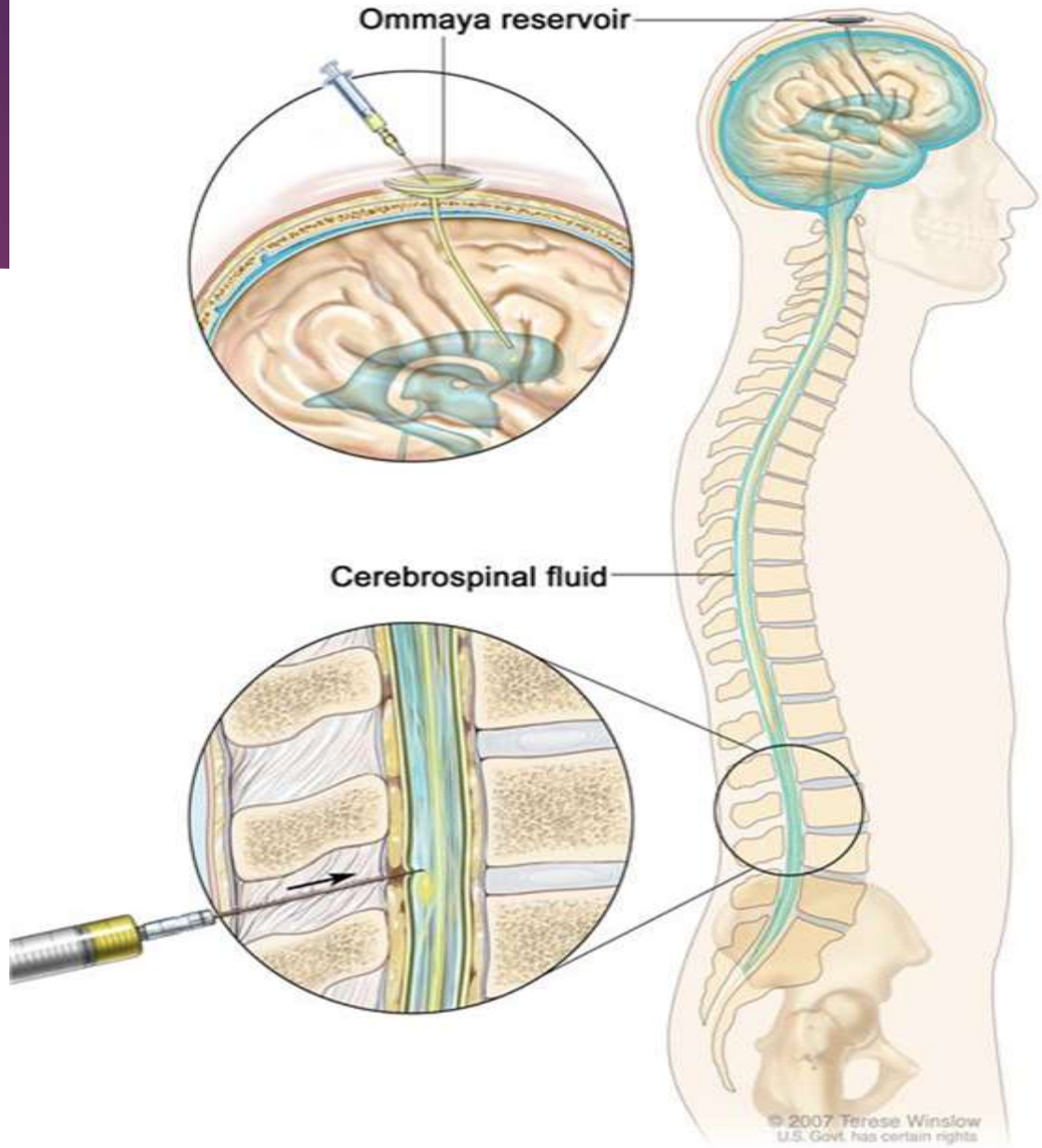
Paracetamol and loratidine
IV Hydrocortisone cycle 1 and 2
Oral predisone (RCHOP)

Management of hypersensitivity reactions

- Stop infusion if reaction occurs
- Symptom management
  - Administer hydrocortisone and antihistamine
  - IV fluid bolus
  - O2 if required
- Medical review
- Consider challenge after symptoms resolve

Intrathecal

- Methotrexate
- Cytarabine
- Hydrocortisone



Intrathecal

- Only specifically trained and authorised health care professionals should prescribe, dispense, prepare, administer, and transport intrathecal drugs
- Intrathecal register
- Normal working hours
- Specified administration areas
- Specific containers
- Formal two person checking procedure

Vinca alkaloids

- Vinca alkaloids administered intrathecally are usually fatal.
- At least 3 cases in Australia over the past 20 years and more than 20 cases worldwide.
- “For intravenous use only-fatal if given by other routes”
- Vinca alkaloids should be prepared in a minibag

Bortezomib

- Sub-cutaneous administration
- Syringe
- At least 3 deaths worldwide due to accidental intrathecal administration of bortezomib - neurotoxin
- "For Intravenous or Subcutaneous Use Only; Fatal if Given by Other Routes."

Sub-cutaneous

- Bortezomib
  - Improved side effect profile
- Cytarabine
  - Low dose for elderly AML
- Azacitidine
  - MDS

  - Daratumumab 1800mg/15mL
  - Trastuzumab 600mg/5mL. Fixed dose of 600mg q21 days.
  - Rituximab 1400mg/11.6mL or 1600mg fixed dose

Azacitidine

- Myelodysplastic syndrome (MDS)/ AML
- Already cytopenic- low platelets, bruising
- Divide dose into two syringes
- Injection site reactions are very common 93% of all grades

Oral administration

Cytotoxic

Alkylating agents:

busulphan, chlorambucil, cyclophosphamide, lomustine & temozolomide

Anti-metabolites:

capecitabine, fludarabine, mercaptopurine, methotrexate & thioguanine

Other

Tyrosine kinase inhibitors: erlotinib, gefitinib, sunitinib, imatinib, alectinib

Small molecule inhibitors: venetoclax, thalidomide, lenalidomide, palbociclib

Hormonal agents: Tamoxifen, abiraterone, letrozole, enzalutamide

Oral Chemotherapy

Advantages

- Greater personal convenience
- Far less travelling for the patient back and forth to hospital
- Patient feels part of the process & empowered
- Reduced use of hospital resources
- Economic benefits
- No IV line or IV complications
- Longer exposure of the cancer to the drug

Disadvantages

- Adverse events can go undetected for longer
- Bioavailability variability
- Drug - Drug interactions
- Drug – Food interactions
- Hard to use if swallowing difficulties
- Accessibility to medical staff is not as fast
- Concordance / adherence issues
- Careful guidance & counselling are a must
- Issues with storage & control
- OSH issues in Pharmacies & nursing homes
- Less direct communication between community pharmacies & prescribers in hospitals

Oral cytotoxic prescriptions - best practice

- Clear and unambiguous Rx 'no MDU'
- Start and stop dates should be clear.
- Single cycle
- Patients should have a contact person and specific instructions about toxicities.
- Protocol should be available to check
- Should not go in a blister pack
- Should not be broken or crushed
- Self administration