Aspects of Intravenous Therapy

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Blaise Pascal (1623-1662)

Sir Christopher Wren (1632-1723)
Clyster

Charles Pravaz (1791-1853)
Alexander Wood (1817-1884)

FIRST HYPODERMIC SYRINGE

A NOVEL SUBCUTANEOUS SYRINGE.

Aid in, and this would resolve into a small case, with detachable case to permit to
be passed under the skin. The small case is ready for any necessary and is not
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PARENTERAL ROUTE

- Intramuscular
- Subcutaneous
- Intravenous
- Others: Intrathecal, Intracardiac

Intramuscular administration

Intramuscular injection sites

Subcutaneous administration
Intravenous cannula

Central Venous Access

Why Central venous access?
- measurement of central venous pressure (CVP)
- venous access when no peripheral veins are available
- administration of vasoactive/inotropic drugs which cannot be given peripherally
- administration of hypertonic solutions including total parenteral nutrition
- haemodialysis/plasmapheresis

Routes for central venous access
- Internal jugular vein
- Subclavian vein
- Femoral vein
- External jugular vein
- Antecubital veins
Insertion sites – Central venous access

Intrathecal administration

Advantages of IV route
- Cannot be absorbed by other routes
- Irritating properties of drugs
- Instant drug action
- Control over rate of administration
- Convenient route if nil by mouth

Disadvantages of iv route
- Possibilities of incompatibilities
- Local complications
- Systemic complication
- Rapid onset of action
- Irritating properties
Local complications

- Phlebitis
  - Chemical
  - Mechanical
  - Bacterial
- Haematoma
- Infiltration
- Extravasation

Phlebitis

Extravasation and Infiltration
**MISSED HITS (1)**

Needle did not enter vein

**MISSED HITS (2)**

Needle entered vein and slipped out again

**MISSED HITS (3)**

Needle went right through the vein

**Infiltration scale**

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
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<tbody>
<tr>
<td>1</td>
<td>No complications</td>
</tr>
<tr>
<td>2</td>
<td>Minor bleeds, infection, bruised site; needle withdrawn</td>
</tr>
<tr>
<td>3</td>
<td>Major bleeds, infection, bruised site; needle withdrawn</td>
</tr>
<tr>
<td>4</td>
<td>Major bleeds, infection, bruised site; needle withdrawn</td>
</tr>
<tr>
<td>5</td>
<td>Major bleeds, infection, bruised site; needle withdrawn</td>
</tr>
<tr>
<td>6</td>
<td>Major bleeds, infection, bruised site; needle withdrawn</td>
</tr>
</tbody>
</table>
Extravasation (1) [Dopamine]

Extravasation (2) [Dopamine]

Extravasation (3) [Taxotere]

Extravasation (4) [Taxotere]
Extravasation (5) [Phenytoin]

Extravasation (6) [Calcium Gluconate]

Extravasation (6) [TPN]

Extravasation (7) [Doxorubicin]
Extravasation (8) [Doxorubicin]

Systemic complications (1)
- Pulmonary embolism
- Pulmonary oedema
- Cardiac tamponade
- Pneumothorax / Haemothorax
- Thrombosis

Pulmonary Embolism (2)
Pulmonary Embolism (3)

Pulmonary Embolism (4)

Pulmonary Oedema (1)

Normal X-Ray  Pulmonary Oedema

Pulmonary Oedema (2)

On admission  Day 2
Cardiac tamponade

- The effusion of blood, air or pus into the pericardial sac, causing compression of the heart.
Thrombosis

Systemic complications (2)
- Speed shock
- Pyrogenic reactions
- Septicaemia
- Drug allergies

Drug allergy - penicillin
Drug allergy – Stevens Johnsons syndrome [phenytoin]

Drug allergy – Toxic Epidermal Necrolysis

Contained in formulation
- Active ingredient
- Buffers
- Bactericides or preservatives
- Stabilising agents
- Solvent

Containers
- Ampoules
- Vials
- Prefilled syringes
Incompatibilities can be between:
- Drug and solution
- Drug and drug
- Drug and container

- Physical
- Chemical
- Microbial
**Factors affecting stability**

- Vehicle used for reconstitution
- Addition of second drug
- Preservative dilution
- Period of time solution stands
- Light

**Precautions for preparation**

**Precautions for preparation (1)**

- Check expiry dates
- Proper dilution/reconstitution
- Double checking
- Check licensing
- Aseptic techniques
- Examine resulting solution

**Precautions for preparation (2)**

- Check expiry dates
- Proper dilution/reconstitution
- Double checking
- Check licensing
- Aseptic techniques
- Examine resulting solution
Precautions for preparation (3)
- Refrigerate on storage
- Protect from light
- Sources of saline for reconstitution
- Outer wrap of PVC bags
- Overfill of liquids
- MULTIDOSE VIALS

Modes of IV administration
- Continuous infusion
- Intermittent infusion
- Bolus injection
- DISPLACEMENT VALUES

Regulatory Authorities Sites
http://www.medicinesauthority.gov.mt/
http://www.emea.eu.int/
Chemotherapy and Compounding Section
In-Patients Dispensary
St.Luke’s Hospital

Tel: 25951559

Medicines and Poisons Information Service
In-Patients Dispensary
St.Luke’s Hospital

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