Part three of this four-part series looks at the advantages and disadvantages of parenteral administration

Administration of drugs 3: parenteral

Parenteral drug administration means any non-oral means of administration, but is generally interpreted as relating to injecting directly into the body, bypassing the skin and mucous membranes. The common parenteral routes are intramuscular (IM), subcutaneous (SC) and intravenous (IV). Box 1 outlines the advantages and disadvantages of parenteral routes.

Parenteral administration requires an appropriate injection technique. If performed incorrectly – for example using the wrong size needle or cannula – it can cause damage to nerves, muscle and vasculature and may adversely affect drug absorption.

**Intramuscular and subcutaneous**

In general, IM and SC injection of drugs establishes a deposit or “depot” that will be released gradually into the systemic circulation. The drug’s formulation will influence the period over which it is released; for example, the formulation of antipsychotic agents such as flupentixol in oil allows them to be administered once a month or every three months.

**Intravenous**

The IV route carries the greatest risk of any route of drug administration. By administering directly into the systemic circulation, either by direct injection or infusion, the drug is instantaneously distributed to its sites of action. This route of administration can be complex and confusing. It may require dose calculations, dilutions, information to be gathered on administration rates and compatibilities with other IV solutions, as well as the use of programmable infusion devices.

The preparation of IV medicines requires the use of an aseptic technique, often in a ward environment that is unsuited to such work. To minimise the risk of errors, it is imperative that practitioners can demonstrate competence to practise safely, and have access to expert information and advice. Box 2 lists considerations for preparing IV drugs.

The National Patient Safety Agency (2007) has highlighted the risks associated with the preparation and administration of injectable medicines and proposed a set of competencies. These provide a useful basis for the creation of policy and training in this area.

**BOX 1. PARENTERAL ADMINISTRATION**

**Advantages**
- Can be used for drugs that are poorly absorbed, inactive or ineffective if given orally
- The IV route provides immediate onset of action
- The intramuscular and subcutaneous routes can be used to achieve slow or delayed onset of action
- Patient concordance problems can be avoided

**Disadvantages**
- Staff need additional training and assessment
- Can be costly
- Can be painful
- Aseptic technique is required
- May require additional equipment, for example programmable infusion devices

**BOX 2. CONSIDERATIONS FOR IV ADMINISTRATION**

- Is the drug suitable for preparation on the ward or should it be prepared in the pharmacy?
- Does the drug require initial dilution? What diluent and volume?
- Does the drug require further dilution? What diluent and volume?
- Is the drug suitable for direct injection or to be infused over time?
- Over what length of time can it be administered?
- Is an infusion device required?
- Is the drug compatible with other drugs or fluids to be administered at the same time?
- Does the drug cause a local reaction?
- Is any monitoring required during or after administration?

**Reference**

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**OTHER ARTICLES IN THIS SERIES**
Part 1 – The oral route, 16 August
Part 2 – Alternatives to the oral route, 30 August
Part 4 – Patient self-administration, 20 September