



## **AUSTRALIAN AND NEW ZEALAND COLLEGE OF ANAESTHETISTS**

ABN 82 055 042 852

### **GUIDELINES FOR THE SAFE ADMINISTRATION OF INJECTABLE DRUGS IN ANAESTHESIA**

#### **1. INTRODUCTION**

- 1.1 Current data suggest that a drug administration error occurs about once in every 135 anaesthetics in the developed world<sup>1</sup> and occasionally causes serious harm to patients. Given the very large number of anaesthetics administered globally, this represents a substantial cause of iatrogenic harm.
- 1.2 The way in which anaesthetists work is unusual in that they generally both prescribe and administer the drugs they use. This removes one check in the process of drug administration, and places a special onus on anaesthetists to develop safe practices.
- 1.3 Improvements depend on an appreciation of the causes of error, and on active adoption of techniques accepted as likely to reduce such events.

#### **2. GENERAL PRINCIPLES FOR THE SAFE ADMINISTRATION OF DRUGS**

- 2.1 The aims of safe administration of injectable drugs in anaesthesia are:
  - 2.1.1 To give the correct drug for the correct patient in the correct dose by the correct route at the correct time.
  - 2.1.2 To record accurately this information in the anaesthetic record.
  - 2.1.3 To be able to demonstrate that 2.1.1 and 2.1.2 have been accomplished reliably.
- 2.2 Anaesthetists should have a detailed understanding of the pharmacology, both pharmacodynamics and pharmacokinetics, of the drugs they prescribe or administer, together with an understanding of potential complications of drug administration and how these should be managed.
- 2.3 Anaesthetists should have a comprehensive understanding of the systems and processes involved in drug prescription and administration.
- 2.4 Every patient to whom any drug is administered must first be identified clearly and explicitly by the person administering the drug.
- 2.5 A complete drug history (including information on allergies) should be obtained explicitly from the patient, and/or the information regarding drug history in the patient's clinical record should be considered before any drugs are administered.
- 2.6 Except in an emergency, when drugs are to be administered by someone other than the anaesthetist, this should occur either under direct medical supervision or there must be a written direction or prescription.

- 2.7 Prescriptions must be legible and include, as a minimum, the generic name of the drug, the dose, the route of administration, the dosage interval, and any special instructions, e.g. on dilution.
- 2.8 Before any drug is administered on behalf of another health professional, explicit communication should take place to ensure that both parties have a shared understanding of the indications, potential contraindications, and any other relevant information.
- 2.9 Adequate lighting and minimisation of distraction are critical for drawing up and administering drugs.

### **3. PURCHASING DECISIONS ON ANAESTHESIA DRUGS**

- 3.1 Management of purchasing and inventory should include consideration of factors relevant to minimising the risk of drug error.
- 3.2 If feasible a designated pharmacist should liaise with a designated (clinical) drug safety officer in the department of anaesthesia over all decisions on anaesthesia drug purchasing and presentation.
- 3.3 The labelling and packaging of drugs should facilitate their identification. When a drug is available from more than one manufacturer, the clarity of the labelling and the avoidance of look-alike packaging or labelling should be considered when making purchasing decisions. Labelling should conform to applicable national or international standards as these are adopted.
- 3.4 Changes to the packaging or labelling of drugs must immediately be widely communicated to all those involved in their administration.
- 3.5 Wherever practicable stocking different concentrations of the same drug should be avoided.
- 3.6 Wherever practicable drugs should be purchased in concentrations that avoid the need for dilution prior to administration. Certain drugs are particularly dangerous when undiluted and these should ideally be supplied in bags of fluid, pre-diluted to concentrations suitable for safe administration.
- 3.7 Consideration should be given to supplying selected drugs for intravenous use in prefilled and pre-labelled syringes rather than in ampoules. Relevant factors include the frequency of use of the drug in routine anaesthesia, the availability of stability data supporting an adequate shelf life, data identifying particular drugs with frequent error and patient harm, and the cost-effectiveness of prefilled syringes for drugs which may be routinely prepared for emergency use but often discarded.

### **4. STORAGE OF ANAESTHESIA DRUGS – THE ANAESTHESIA WORKSPACE**

- 4.1 Anaesthesia drug drawers and workspace should be organised formally with attention to: tidiness; and the position of ampoules and syringes. Standardization within each institution (and ideally, each region) is highly desirable.
- 4.2 Many drugs used in anaesthesia are dangerous. It is however important to separate drugs which are both dangerous and less frequently used (e.g. many emergency drugs) from those used routinely in anaesthesia. Ideally those drugs which are dangerous and less frequently used should be stored securely but accessibly in a central repository in the theatre suite. As a minimum safety measure they should be stored in a separate drawer within the anaesthetic cart.
- 4.3 Look-alike and sound-alike ampoules of drugs of different pharmacological classes should be stored apart.
- 4.4 Drugs should be stored in ways designed to facilitate their identification and minimize the risk or error of misidentification. Consideration should be given to storing them in their

original packaging until just before they are drawn up. Special care should be taken with ampoules that look similar, have similar names, or have labels that are difficult to read.

- 4.5 Adequate, uncluttered surface space and appropriate trays, clean for each patient, should be provided for drawing up, arranging and holding the drugs used in each anaesthetic.

## **5. LABELS**

- 5.1 The legibility of labels on ampoules and syringes should be optimised according to agreed standards in respect of some or all of font, size, colour and the information included.
- 5.2 Self-adhesive pre-printed labels for application to syringes should be colour coded by class of drug and conform to national standards (e.g. the Australian/New Zealand standard AS/NZS 4375:1996) Every anaesthetising location should hold a complete set of all such available pre-printed labels.
- 5.3 In the absence of pre-printed labels for syringes, hand-written ones should be prepared, or syringes should be labelled directly using permanent marker pens.

## **6. DRAWING UP AND CHECKING DRUGS BEFORE ADMINISTRATION**

- 6.1 The label on any drug ampoule or syringe must be carefully read before a drug is drawn up or injected. As a minimum, the name and dose of the drug must be checked.
- 6.2 A system should be in place within the department for regularly checking drug stock for expired drugs. It is highly recommended that the anaesthetist also check when drawing up that drugs are within date.
- 6.3 An agreed and consistent process should be in place to determine whether syringes are labelled prior to or after a drug is drawn up. Drugs should be drawn up using one syringe and one ampoule at one time. The label on the ampoule should be checked, and matched to that on the syringe.
- 6.4 If there is an interruption to the process of drawing up and checking the ampoule, then the syringe contents should be discarded and the process restarted.
- 6.5 If practicable, immediately before it is administered each drug's identity and dose should be checked with a second person or an automated device. Drugs given intrathecally should always be checked with a second person.
- 6.6 Each drug should be administered in accordance with accepted practice for that drug.
- 6.7 Contamination of the drug must be avoided. To minimise the risk of cross infection between patients the contents of any one ampoule should be administered to only one patient.

## **7. STORAGE OF DRUGS AND AMPOULES DURING ANAESTHESIA**

- 7.1 The time interval between drawing up a drug and administering it should be as short as practicable.
- 7.2 Drugs drawn up should be stored in a logical and orderly fashion in special receptacles reserved for this purpose.
- 7.3 Drugs drawn up that are intended for different routes of administration must not be stored in the same receptacle.
- 7.4 Drugs drawn up for emergency use should be stored in a separate receptacle. This practice should be limited to situations where it is likely that the time taken to draw up these drugs would place the patient at risk. Retention of drugs in this way is associated with risks of inadvertent administration and contamination. Great care is needed, and this is a situation

where properly manufactured, sealed and labeled, pre-filled syringes with reasonable shelf lives can enhance safety.

## 8. MAINTENANCE OF ACCURATE RECORDS

- 8.1 An accurate record of every drug administration, including the name and dose of the drug, and the route and time of administration, is essential for safe management of patients, and as a tool for audit and review.
- 8.2 It is important to be able to demonstrate, if doubt arises, that the drugs recorded as given are the ones that have actually been given. Errors may be possible to correct if they can be identified. One way of achieving this is to retain empty ampoules in an orderly fashion until the end of each anaesthetic, for checking if required. In complex cases involving the administration of many drugs, it may be helpful to reconcile the empty ampoules against the anaesthetic record at convenient times during the procedure, after which the reconciled ampoules can be set aside. Retained glass ampoules themselves pose a sharps hazard, and should be placed in a suitable robust and preferably closed container.
- 8.3 Once drug utilization has been reconciled at the conclusion of the anaesthetic and the anaesthetic record completed, all partially used ampoules and syringes containing drugs should be safely discarded. Every institution should have a standardized procedure for discarding drugs, in part to minimize the risk of drugs being given unintentionally to successive patients. This is a special risk in areas with rapid case turnover such as endoscopy suites.

## 9. INFUSION DRUGS

- 9.1 Wherever practicable infusion pumps and syringe drivers used for the administration of intravenous drugs should be standardised within an institution.
- 9.2 When drugs are given by infusion, the patient end of the infusion line should be labelled and precautions taken with one-way valves to avoid any siphoning of the infused drug.
- 9.3 The use of recognisably different infusion devices and colour coding for infusions via different routes is strongly recommended..

## 10. RELATED DOCUMENTS

The following Professional Standards Documents should be interpreted in light of this document:

- PS6 The Anaesthetic Record. Recommendations on the Recording of an Episode of Anaesthetic Care.

## 11. REFERENCES

1. Webster CS, Merry AF, Larsson L, McGrath KA, Weller J: The frequency and nature of drug administration error during anaesthesia. *Anaesthesia and Intensive Care* 2001; 29: 494-500

## COLLEGE PROFESSIONAL DOCUMENTS

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*Promulgated: 2009*

*Reviewed:*

*Date of current document: April, 2009*

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