



GENERAL PRACTICE
south

Drug calculations for the General Practice Nurse.

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Nursing Requirements for Drug calculations

The practice nurse must have demonstrated competence in the following areas:

- Calculation
- Administration
- Knowledge of Medication
- Communication
- Legal aspects
- Safety.

How have these areas been assessed?

Examples could be.....

Calculation: completion of annual drug calculation test:

<http://nursing.flinders.edu.au/students/studyaids/drugcalculations/>

Administration: Documented observation by peer nurse or supervising nurse.

Knowledge of Medication: Use of reference book/ online resources such as Mims.

Communication: Checking of the drug and its dose with another nurse/GP.

Explanation to the patient. Documentation in the patient's notes.

Legal Aspects: Consider scope of practice, proper procedure for checking drugs according to policy and procedure manual, confidentiality and privacy for the patient, documentation, Management of S8 drugs.

Safety: Infection control policy and procedures, personal safety, cytotoxic drugs.

Drug Calculation Formulas:

Calculating the dosage of medications:

First convert drug amounts to the same unit.

Then: **Dose required = $\frac{\text{Strength required}}{\text{Stock Strength}}$**

For example: A patient with ischaemic heart disease is ordered 300mgs Clopidogrel stat. Stock available is 75mg.
 $\frac{300 \text{ milligrams}}{75 \text{ milligrams}} = \mathbf{4 \text{ tablets}}$

Calculating the dosage of liquid medications:

First convert the drug amounts to the same unit.

Then: **Volume required = $\frac{\text{Strength Required} \times \text{volume of stock solution}}{\text{Stock strength}}$**

For example: A patient is ordered Penicillin 250 mgs. Stock available is 125mgs/5ml.
 $\frac{250\text{mgs} \times 5\text{mls}}{125\text{mgs}} = \mathbf{10 \text{ mls}}$

Calculating drip rates:

First convert volume to milliliters and time to minutes.

Then: **Drops per minute = $\frac{\text{volume} \times \text{drop factor of giving set}}{\text{Time expressed in minutes}}$**

For example: A patient is ordered 1000mls over 12 hours. The giving set delivers 20 drops/ml.
 $\frac{1000\text{mls} \times 20}{720 \text{ minutes}} = \mathbf{27.7 \text{ drops per minute}}$

Calculating Paediatric drug doses:

Great care must be taken when administering drugs to children. 2 staff must check each calculation carefully.

Paediatric doses may be expressed as either:

mg/kg/day with the appropriate number of divided doses,

or mg/kg/dose with the appropriate frequency.

For example:

A 34 kg child is ordered Erythromycin 40mg/kg/day, with 4 doses per day.

$40\text{mg} \times 34 \text{ kg} = 1360 \text{ mg}$

$\frac{1360}{4} = \mathbf{340 \text{ mg per dose.}}$

4 doses

or: A 20kg child is ordered Paracetamol 15mg/kg/dose every 4-6 hours PRN.

$15\text{mg} \times 20\text{kg} = 300\text{mg.}$

Abbreviations:

Mane	morning
Midi	At midday
Nocte	At night
PO	Give orally
PV	Per vagina
PR	Per rectum
S/L	Sublingual
PRN	As required
BD	Twice a day
TDS	Three times a day
QID	Four times a day
Stat	Immediately
1/52	One week
1/7	One day
2/52	Two weeks
1/12	One month
gm	gram
mg	milligram
mcg	microgram
iu	International Units

Metric Conversions:

1 kilogram = 1000grams

1 gram = 1000 milligrams

1 milligram = 1000 micrograms

1 litre = 1000 millilitres

*****Nurses in General Practice can undertake a drug calculation by using the following online website*****

<http://nursing.flinders.edu.au/students/studyaids/drugcalculations/>

A good drug calculation resource is:

Nursing Calculations 7th Edition, by J.D. Gatford and N. Phillips.

Management of Cytotoxic drugs in General Practice

Cytotoxic drugs are therapeutic agents intended for, but not limited to, the treatment of cancer. These drugs are known to be highly toxic to cells, mainly through their action on cell reproduction. Many have proved to be carcinogens, mutagens or teratogens. Cytotoxic drugs, such as Methotrexate, are increasingly being used in a variety of healthcare settings, laboratories and veterinary clinics for the treatment of cancer and other medical conditions such as rheumatoid arthritis, multiple sclerosis and auto-immune disorders.

In the workplace, occupational exposure may occur where control measures fail or are not in place. Exposure may be through skin contact, skin absorption, inhalation of aerosols and drug particles, ingestion and needle stick injuries resulting from drug preparation, drug administration, handling patient waste, transport and waste disposal, or through spills. Little is known of the specific long-term effects of occupational exposure to cytotoxic drugs and related wastes. There is, however, sufficient evidence to indicate adverse health effects may result, and that measures are required to protect workers and others.

The Tasmania Workplace and Safety Act (1995) clearly defines the responsibility of the employer to provide a safe working environment as well as safe systems of work. All staff should be trained about the risks associated with cytotoxic drugs.

Consideration should be given to:

- The purchase of pre-prepared, unit doses of parenterally administered cytotoxics.
- Use of protective equipment such as gowns, gloves and glasses.
- Availability of dedicated cytotoxic waste facilities.
- Allocation of dedicated storage areas.
- The availability of a cytotoxic spills kit in practices preparing and administering cytotoxic drugs. (Cytotoxic spills kits are produced and may be ordered through Baxter.)
- Purple Nitrile gloves and Cytotoxic sharps containers may be ordered through your medical supplier.

An online training video on the management of cytotoxic spills can be seen by clicking on the following link: http://www.crghealthcare.com.au/index_frames.html

References

- Workplace Victoria; "Handling Cytotoxic Drugs in the Workplace" January 2003.
- CRG Healthcare Website "Hazardous Drug Spill Kit Training"
- Power Point Presentation "Safe Handling of Cytotoxic Drugs" .Presentation given by Michael Wiese, Pharmacy Department, Royal Hobart Hospital. May 2008. (A copy of this presentation can be found on the General Practice South website: www.gpsouth.com.au)