

FORMULAS

1) TO WORK OUT HOW MANY MG/KG/MIN OF GLUCOSE

$$\frac{\text{Rate} \times \text{dext}\% \times 1000}{100} = \text{mg/hr}$$

$$\frac{\text{mg/hr}}{\text{wt}} = \text{mg/kg/hr}$$

$$\frac{\text{mg/kg/hr}}{60} = \text{mg/kg/min}$$

Eg 4ml/hr – 1.5 kg baby – 5% glucose

$$\frac{4 \times 5 \times 1000}{100} = 200$$

$$\frac{200}{1.5} = 133.3 \text{ mg/kg/hr}$$

$$\frac{133.3}{60} = 2.2 \text{ mg/kg/min}$$

2) TO INCREASE GLUCOSE PERCENTAGE

$$\frac{\text{Vol} \times (\text{req}\% - \text{avail}\%)}{(\text{add}\% - \text{avail}\%)} = \text{amount of additive glucose required}$$

To make 50ml of 13% glucose, using 50% glucose ampoules and 10% bags

$$\text{Eg } \frac{50 \times (13-10)}{(50-10)} = \frac{50 \times 3}{40} = \frac{15}{4}$$

= 3.75 mls 50% glucose and 46.25 mls of 10% glucose

3) TO DECREASE GLUCOSE PERCENTAGE

$$\frac{\text{Required strength} \times \text{volume}}{\text{Stock strength}}$$

= amount of stock glucose plus amount of H2O

Eg decrease 5% - 3% to make a 50 ml syringe

$$\frac{3 \times 50}{5} \text{ 30 mls 5\% glucose and 20 mls of H}_2\text{O}$$

METRIC CONVERSION

1 mg = 1000 microgram

0.1 mg = 100 microgram

0.01 mg = 10 microgram

TO CONVERT mg TO MICROGRAM

mg x 1000 = microgram

eg 2.3 mg = 2.3 x 1000 = 2,300 microgram

TO CONVERT MICROGRAM TO mg

$\frac{\text{microgram}}{1000}$ = mg

eg $\frac{100}{1000}$ = 0.1 mg

**KING EDWARD MEMORIAL AND PRINCESS MARGARET HOSPITALS
NEONATOLOGY CLINICAL CARE UNIT (NCCU)
INJECTABLE DRUG GUIDELINES**

This table provides a guide to the compatibilities of drugs commonly infused in the NCCU.

Drug compatibilities are concentration, temperature and light dependant.

Do not use solutions where there is a visual change in the bag, or tubing.

Contact your pharmacist for further information.

	Amphotericin	Calcium Gluconate	Dobutamine	Dopamine	Morphine	Sodium bicarbonate	TPN *	Sodium Chloride	Glucose
Amphotericin	●	No	No	No	No	Yes	No	No	Use Buffered Solution
Calcium Gluconate	No	●	Yes	Yes	Yes	No	Yes	Yes	Yes
Dobutamine	No	Yes	●	Yes	Yes	No	Yes	Yes	Yes
Dopamine	No	Yes	Yes	●	Yes	No	Yes	Yes	Yes
Morphine	No	Yes	Yes	Yes	●	No	Yes	Yes	Yes
Sodium Bicarbonate	Yes	No	No	No	No	●	No	Yes	Yes
TPN *	No	Yes	Yes	Yes	Yes	No	●	Yes	Yes

TPN is the amino acid/glucose solution only. It does not include Fat Emulsion.

PHARMACOLOGICAL TREATMENT – OPIATE WITHDRAWAL

If the mother has used opiates (eg. methadone, heroin, pethidine) during pregnancy, phenobarbitone and/or morphine may be used to manage symptoms of NAS. The choice of pharmacological treatment should be decided in consultation with a neonatal consultant. Infants with more severe symptoms of NAS that do not respond adequately to phenobarbitone may be managed on the morphine regime (as outlined below). Infants with severe NAS may initially require both phenobarbitone and morphine until their symptoms are adequately managed ie. NAS score consistently <8.

Phenobarbitone Regimen

NAS score	Dose / Action
Score averages ≥ 8 for 3 consecutive scores	LOADING DOSE: Phenobarbitone 15mg/kg oral or IMI stat. Medical staff are to review the infant within 12-24 hours of the loading dose to determine whether a maintenance dose is required. MAINTENANCE DOSE: Phenobarbitone 6mg/kg/day (oral) in 2 divided doses.
If score persists ≥ 8 despite phenobarbitone 6mg/kg/day	Phenobarbitone 8mg/kg/day (oral) in 2 divided doses.
If score persists ≥ 8 despite phenobarbitone 8mg/kg/day	Phenobarbitone 10mg/kg/day (oral) in 2 divided doses

Use of Phenobarbitone in Combination with Morphine

Phenobarbitone 10mg/kg may be prescribed as a loading dose when phenobarbitone is to be used in combination with morphine to manage severe NAS. Upon achieving adequate control of symptoms, one of these medications may be weaned.

Morphine Regimen

Pharmacy dispenses oral morphine as a 1mg/ml aqueous solution. Morphine has been shown in a randomised-controlled trial to be better than phenobarbitone in preventing seizures in infants with opiate withdrawal although it does increase the time that the infant requires treatment.

NAS score	Dose / Action
Score averages ≥ 8 for 3 consecutive scores	Morphine 0.5mg/kg/day (oral) in 4 divided doses.
If score persists ≥ 8 despite morphine 0.5mg/kg/day	Morphine 0.7mg/kg/day (oral) in 4 divided doses.
If score persists ≥ 8 despite morphine 0.7mg/kg/day	Morphine 0.9mg/kg/day (oral) in 4 divided doses.
When infants are on ≥ 0.9 mg/kg/day	Continuous SaO ₂ monitoring*.

- Opiates in high dose are powerful respiratory depressants

Weaning Regimen: (this is empirical) After scores fall below treatment level (ie score < 8 for 48 hours, the dose should be reduced by 0.05ml (0.05mg) per dose every 4 days or longer, depending on the scores. The length of morphine treatment may vary from one to several months.

Non Opiate CNS Depressant Withdrawal

If the mother has used non-opiate drugs during pregnancy (central nervous system depressants such as: benzodiazepines, barbiturates, and alcohol) phenobarbitone is the drug of choice for management of NAS.

Phenobarbitone Regimen

NAS score	Dose / Action
Score averages ≥ 8 for 3 consecutive scores	Phenobarbitone 15mg/kg oral or IMI stat, then 6mg/kg/day (oral) in 2 divided doses.
If score persists ≥ 8 despite phenobarbitone 6mg/kg/day.	Phenobarbitone 8mg/kg/day (oral) in 2 divided doses.
If score persists ≥ 8 despite phenobarbitone 8mg/kg/day	Phenobarbitone 10mg/kg/day (oral) in 2 divided doses.

For barbiturate withdrawal, after scores fall below treatment level (ie. ≤ 8) for 48 hours the dose should be reduced by 2mg per dose every 4th day or longer depending on scores. For non-barbiturate withdrawal (eg benzodiazepines), the dose may be reduced more rapidly after withdrawal symptoms settle.

Prescribing and Administration of Drugs to Neonates

STANDARD: - All drugs prescribed and administered to an infant, under the care of the Neonatology Clinical Care Unit (NCCU), will be carried out by relevant, appropriately trained and qualified staff following the unit policy and procedures.

In Ward 6B at PMH the coordinator or delegate will be either a Clinical or a Neonatal Nurse.

In SCN3 at KEMH the coordinator or delegate will be either a Clinical or a Neonatal Trained Nurse.

In SCN2 at KEMH the coordinator or delegate will be either a Clinical or a Neonatal Trained Nurse.

In SCN2B at KEMH the coordinator or delegate will where possible be either a Clinical or a Neonatal Trained Nurse or if necessary a Registered Nurse who has successfully completed the drug checking and administration and coordinator duties training packages and who have been in the unit 12 months.

In the HDU at KEMH the coordinator or delegate will where possible be either a Clinical or Neonatal Trained Nurse or if necessary a Registered Nurse who has successfully completed the drug checking and administration and coordinator duties training packages and who have been in the unit 12 months.

For nurses who have already undertaken coordinator duties within the unit there will be recognition of previous experience

CRITERIA

1. All policies related to the prescribing, administration and disposal of drugs developed for the NCCU would be ratified by the Chief Pharmacist who has the delegated authority from the Chief Executive.
2. All drugs prescribed for an infant will be ordered by a medical officer employed by the organisation and/or NCCU, on an approved medication chart, with the exception of drugs listed in this policy.
3. Prescriptions must be written in indelible black ink to avoid orders becoming illegible.
4. All drugs prescribed for an infant will be ordered in weight per kilogram of body weight and not by fluid volume eg micrograms, milligrams, grams not millilitres. With the exception of calcium glubionate, sodium phosphate, Fergon, Pentavite and Nystatin.
5. All drugs prescribed for an infant will have the frequency ordered in hours or using accepted abbreviations listed in this policy, such as 6 hrly or 6/24 or qid.
6. Only standard abbreviations listed in this policy or in the NCCU Neonatal Nursing Practice Manual Appendix may be used on a medication chart. The exception being **microgram/s** and **daily** which must be written in full.
7. The prescribed dose should be able to be accurately measured.
8. When ceasing a drug a diagonal line must be drawn from the hour of cessation to the top line for that particular drug.
9. When changing dosage or frequency of a drug, the order must be ceased and entirely rewritten.
10. Each medication chart will have a printed label on the front of the chart showing the neonates:

- name
 - date of birth
 - Unit number.
11. Every drug ordered on the chart must be legibly printed and contain the following information:
- generic name of the drug
 - dose
 - date prescribed
 - frequency of administration
 - route of administration
 - printed name and legible signature of the prescribing Medical officer
 - date of ceasing/changing dosage.
12. **An up to date NCCU Drug Protocols Manual will be provided which will contain the following information:**
- generic names of drugs
 - dosage regimens
 - dilution regimens
 - preferred route/s of administration and/or method of administration
 - contraindications
 - side effects
 - compatibility.
13. Any drug that is not listed in the NCCU Drug Protocols Manual must be noted and a protocol developed.
14. Any drug prescribed outside the protocols must be checked by a pharmacist and or a consultant medical officer and countersigned in the medication chart.
15. For all drugs prescribed in an approved research trial the research protocol will be followed.
16. An appropriately trained nurse may give all drugs listed in the NCCU Drug Protocols Manual unless otherwise indicated in a specific drug protocol.
17. All staff will use the NCCU Drug Protocols Manual when prescribing and administering drugs.
18. **A pharmacist will supervise the production and continuing review of the NCCU Drug Protocols Manual in conjunction with medical and nursing staff.**
19. Drugs ordered verbally by a medical officer are **not** to be given to a neonate until these are written on a medication chart. The exception is in a life-threatening emergency when drugs are required quickly.
20. A medical officer must verbally order the drugs and the dose, and in some circumstances give the drug. The medical officer is responsible for checking that the drug prepared is the drug and dose he/she ordered before it is given. The NCCU Drug Protocols Manual must be followed for the preparation of all drugs even in an emergency.
21. A neonatal trained nurse may give the verbally ordered drugs under direction from the medical officer. Two nurses must still be involved in the checking of the verbally ordered drug. A nurse involved in the emergency must write down the drugs, doses and times given.
22. After the emergency has finished the medical officer must prescribe the given

drugs on the drug chart and the person giving the drug initial the drug chart and document these on the neonatal observation chart and in the progress notes.

23. In accordance with The Hospital Policy No 27 "ADMINISTRATION OF PARENTERAL DRUGS" any doctor giving parenteral drugs to a neonate must have the drug checked by another person qualified to check drugs. ie another doctor, a nurse or pharmacist. The exception being an anaesthetist or in a life threatening emergency.
24. Registered/enrolled nurses may give parenteral drugs to an infant as long as they have completed an appropriate skills assessment package and been deemed competent. The exception being parenteral narcotics which must be checked and given by two registered nurses.
25. Enrolled nurses will give parenteral drugs under the direct supervision of a registered nurse.
26. Two nurses one of which must be the coordinator or delegate, will check all drugs given to a neonate. The exception being the drugs listed in this policy (List of drugs which do not need to be checked by the coordinator or delegate) which can be checked by one registered nurse and one registered/enrolled/mothercraft nurse.
27. The staff member giving the drug will initial in the appropriate box on the drug chart and document the drugs given on the neonatal observation chart. Any staff member giving drugs must print their name and designation and sign their usual initials on the back of each medication chart.
28. Where alternative routes (oral/pr) or a dose range (5-10mg) are ordered, the route chosen and the dose given must also be documented on the medication sheet.
29. When topical drugs are prescribed the area of application must be specified.
30. Both staff members checking the drugs are responsible for the safe administration of the drug.
31. All drugs must be given or a slow infusion commenced as soon as possible after the drug has been drawn up. Oral drugs can be left to give with a feed as long as the feed is within the next 30 minutes.
32. When drawing up and giving IV or UA drugs, aseptic technique must be used at all times to ensure the sterility of the drugs being given.
33. When a bag of IV fluid is used as a diluent for compatible drugs or for flushes, the bag may be used for more than one dose (for the same or more than one infant) as long as the bag is not punctured more than eight (8) times, and it is discarded after 24 hours. The bag must be labelled with the date and time of the initial use and the number of times the bag has been punctured.

34. When giving more than one drug at a time each drug must be labelled with:
- the drug
 - the route of administration
 - the initials of the staff drawing up the drug.
35. All nursing staff will follow the procedures for giving drugs as per **Section 6** of The NCCU Neonatal Nursing Practice Manual.
36. In accordance with The Hospital Policy No 29 “DRUGS OF ADDICTION” all staff will follow the unit policy for giving narcotics to an infant.
37. A drug incident reporting system is in place and must be used.
38. Incident reports should be reviewed regularly and changes made to policy to reduce risk.
39. A regular audit of drug charts and the process of administration should be carried out to check the rate of compliance to the policy.
40. A comprehensive training program for all relevant staff on the administration of drugs must be in place.
41. All nursing staff employed by the NCCU must complete a drug calculations and administration of drugs competency package within 1 week of commencement.
42. Agency nurses working in the NCCU may be involved in the checking and giving of all medications to neonates as long as the other registered nurse checking the drugs is the coordinator or delegate of the area. This includes the giving of intravenous drugs when the skills of the agency nurse are known by the registered nurse checking the drugs.
43. Mothercraft nurses must not give intravenous or intramuscular drugs but may give all other drugs to neonates in their care as long as the other nurse checking the drug is a neonatal trained registered nurse employed by the NCCU.

List of Drugs which do not need to be prescribed on a Medication Chart

The following drugs do not need to be prescribed on a medication chart.

NB The standing orders or treatment protocol needs to be followed. Use of these preparations will be recorded in the nursing notes and/or on the neonatal observation chart:

- ◆ Vitamin K
- ◆ Hepatitis B vaccination
- ◆ Non prescription creams and pastes for the protection of skin, mucosal membranes and conjunctiva. **This excludes preparations containing steroids or antibiotics**
- ◆ Normal saline for use with suction or as nose drops
- ◆ Active dressings, eg. Hydrocolloids.

List of Drugs which do not need to be checked by a Neonatal Trained Nurse.

The following drugs do not need to be checked by a neonatal trained nurse but still

must be checked by two nurses one of which must be a registered nurse permanently employed by the NCCU:

- ◆ Fergon - Ferrous gluconate
- ◆ **Pentavite**
- ◆ Non prescription creams and pastes for the protection of skin, mucosal membranes and conjunctiva. **This excludes preparations containing steroids or antibiotics**
- ◆ Normal saline for use with suction or as nose drops
- ◆ Active dressings, eg. Hydrocolloids.

Standard Abbreviations to be used on Medication Charts.

bid	twice a day
ETT	endotracheal tube
g	gram
hrly	hourly eg 18 hrly
IA	Intra-arterial
IM	intramuscular
INH	inhalation by spacer
<i>IU</i>	<i>international unit</i>
IV	intravenous
kg	kilogram
mg	milligrams
mL	millilitres
mmol/L	millimols per litre
NEB	nebulisation
NGT	naso gastric tube
O	oral
prn	as necessary
qid	four times a day
SC	subcutaneous
tds	three times a day

Policy for Checking and Administering Drugs (Nursing)

STANDARD: -The shift coordinator, or a neonatal trained registered nurse nominated by the shift coordinator, and the registered/enrolled/mothercraft nurse caring for the infant are responsible for checking and administering of drugs to an infant. One of the two nurses checking the drugs must be neonatal trained. The exception being non-neonatal trained clinical nurses working on 6B staff who have been deemed competent by a level 3 nurse may check drugs in place of a neonatal trained nurse. All references to nurses in this policy relate to registered nurses, enrolled nurses, mothercraft nurses and registered midwives.

CRITERIA

NB This policy is in addition to the procedures for giving drugs as per NCCU Drug Protocols Manual. All policies and procedures must be followed.

1. The first dose of a drug ordered for a neonate should be commenced within 5 to 30 minutes of the drug being ordered (unless the drug is being prepared in pharmacy) and the time of the next dose organised to fall on the time closest to the treatment regimen. Drug round times are 0800, 1400,1600,2000, 2400 and 0200 hours.
2. The infants drug chart is checked to determine the drugs to be given.
3. When a drug needs to be given both nurses will refer to the NCCU Drug Protocols Manual for individual information on each drug and follow the information provided.
4. Both nurses will independently calculate the amount of drug required based on the prescribed order and the information provided in the drug and procedure manuals.
5. If there is any doubt with the calculation of the drug amount a third nurse should be asked to independently check the calculation.
6. Both nurses are responsible for checking the following (see detailed process map attached):
 - ◆ right drug
 - ◆ right dose
 - ◆ right time
 - ◆ right route
 - ◆ right patient.
7. If there is any doubt about the appropriateness of any of the above information then the nurses must consult the prescribing medical officer or the registrar on for that area **before a drug is given.**
8. The drug may be given by either of the nurses involved in the preparation of the drug as soon as possible after the drug is drawn up.
9. When multiple dose vials are mixed and retained for further use each vial must have a label attached stating:
 - ◆ the date and time of preparation
 - ◆ the amount and type of diluent used
 - ◆ the legible signatures of two staff who checked the dilution.
10. If there is any doubt in a nurse's mind about the previously diluted drug a nurse

can refuse to administer drugs from that vial and request that a new vial is diluted.

11. If there is any delay between the preparation and the giving of the drug a label must be attached to each drug stating:

- ◆ the drug
- ◆ the route of administration
- ◆ the initials of the staff drawing up the drug.

12. The person who administers the dose, must sign the drug sheet and, if appropriate, note the time and date of administration.

13. Where alternative routes (oral/pr) or a dose range (5-10mg) are ordered, the route chosen and the dose given must also be documented on the medication sheet.

14. When prn drugs are given, the reason why they are given and the results obtained must be documented.

15. If a drug is not given, the reason must be documented on the medication sheet using the codes as listed on the chart.

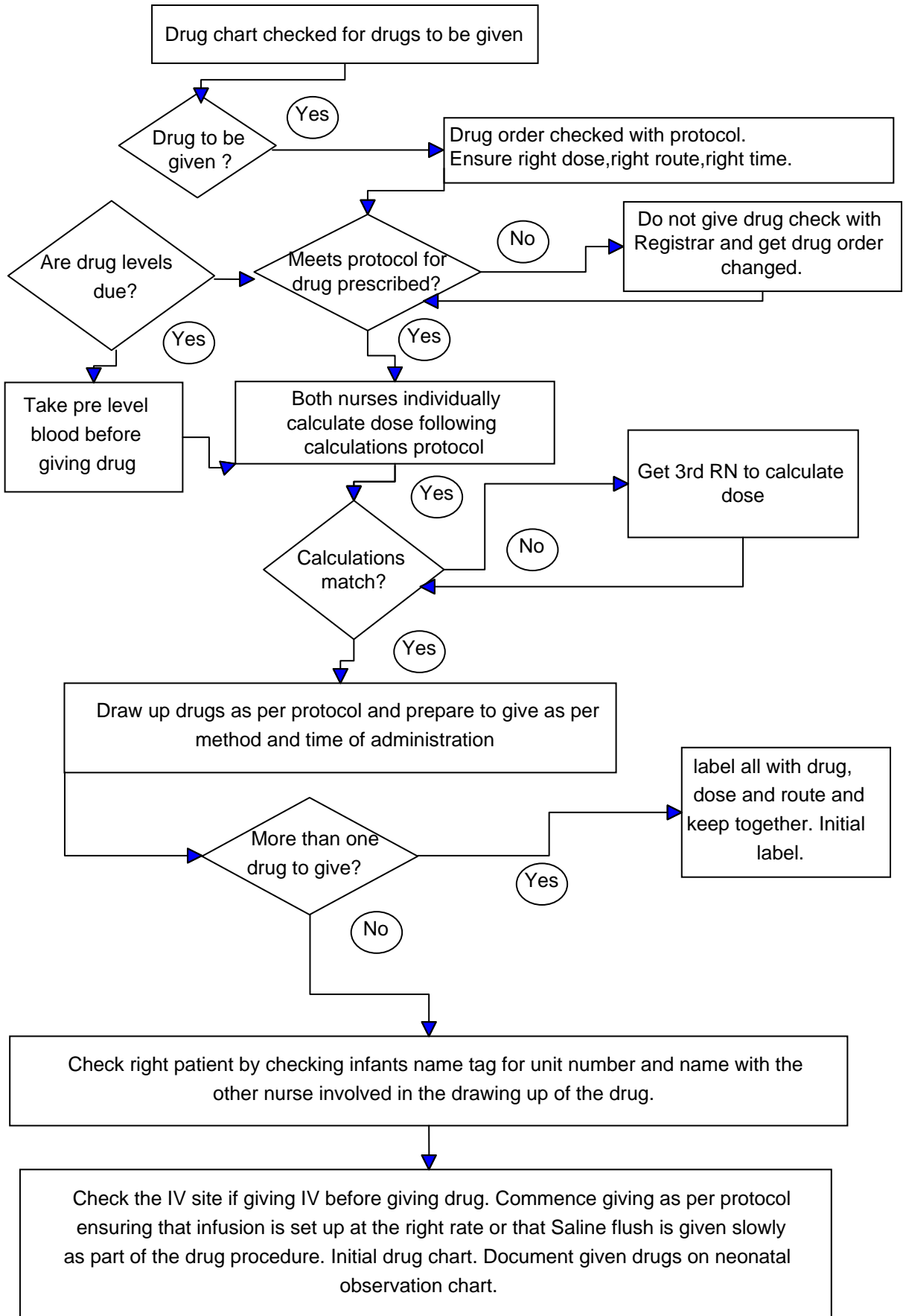
16. All parenteral drugs will be given as a bolus push on an approved syringe/infusion pump as indicated in The NCCU Drug Protocols Manual, unless directed otherwise eg adenosine given quickly.

17. Drugs may be added to parenteral infusion fluids, however, a nurse must only add one additive to each burette, syringe or bag. The NCCU Drug Protocols Manual or Pharmacy must be checked for compatibility. The exception to this is when dextrose concentration is changed a nurse may add one extra additive.

18. **No** drugs are to be added to packs of blood and blood products or to hyperalimentation fluids.

19. Drugs may be added through a sideline as close to the cannula as possible when hyperalimentation is running as long as the compatibility is checked with Pharmacy. All intravenous lines must have a non-return valve in each line to prevent one fluid back flowing up another line. Please check the NCCU Drug Protocols Manual for more details.

Process Map For Checking And Giving



Administration of Drugs by Parents

1. A parent will not give drugs to an infant unless the drug is to be continued after discharge and parents need to be taught how to give the drug.
2. Any drug to be administered by the parent will be prescribed on the medication chart whilst the infant is an inpatient.
3. Any drug to be administered by a parent will be supervised by a registered nurse whilst the infant is an inpatient and the chart annotated by the supervising nurse (eg given by parent).

Supply of Drugs to Parents

On occasions staff may be requested to provide medications for parents. Where this occurs the following policy must be followed.

1. Prescription drugs must not be provided to parents and the parents should be directed to their own general practitioner or to a local general practice if the parent is from the country.
2. If a mother who is an inpatient in an obstetric ward at KEMH, requests any medication she must be directed back to the ward.
3. If a mother requests (not an inpatient) a specific non-prescription item (eg. an unscheduled medicine such as paracetamol or pharmacy medicine such as paracetamol and codeine) the nurse may supply one dose of the drug for the mother to self-administer. The nurse should ensure that the mother could explain the reason for the pain or discomfort before administering the medication.
4. No other member of the public or family will be given drugs and should be directed to a pharmacy or a local medical practice.

Supply of Medications to Mothers admitted as In-Patients on Ward 6B

1. Women admitted to the parent corridor of ward 6B still requiring obstetric management (less than 5 days post partum) by a midwife must be fit enough to self care and administer their own medications.
2. Any woman requiring IV therapy or IV medications must be transferred out of the unit to KEMH or back to the referring hospital.
3. Prescription drugs must not be provided from a ward supply to women admitted as inpatient without direction from a medical officer.
4. All drugs must be prescribed on a medication chart by a medical officer and dispensed through Pharmacy.
5. A woman residing as a boarder in the parent corridor who has commenced a course of drugs such as antibiotics should bring the rest of the course with them from the referring hospital and self-administer the drugs.
6. In exceptional circumstances a medical officer may write a prescription on an external drug prescription pad supplying his/her provider number and the

prescription dispensed through the hospital pharmacy at the current cost for prescriptions or taken to an external pharmacy for dispensing.

7. Any drugs held by women in the parent corridor must be securely locked away from access by visiting children.
8. If a woman residing as a boarder requires attention or prescription of drugs she should be referred back to her own doctor or to the Emergency Centre at KEMH.
9. If a mother requests a specific non-prescription item (eg. an unscheduled medicine such as paracetamol or pharmacy medicine such as paracetamol and codeine) the nurse may supply one dose of the drug for the mother to self-administer. Any further requests by an inpatient mother should be provided by a written prescription.
10. If a woman residing as a boarder requests any more non-prescription drugs than one dose she must be asked to provide her own.
11. Schedule 8 drugs must not be prescribed for an adult inpatient on ward 6B.
12. Antidepressants are only used as a continuing treatment or when prescribed by a PMH psychiatrist.
13. Women who are on a methadone program must follow the standard procedure for the supply of methadone.
14. A registered midwife may administer Ergometrin/Syntocinon in an **emergency** to a woman who has a severe post partum haemorrhage following the NCCU postpartum haemorrhage protocol.

Schedule 8 Drug Policy and Procedures

STANDARD: - Schedule 8 drugs will be ordered and administered in accordance with the Poisons Act and the Hospital Policy No 29 "DRUGS OF ADDICTION".

CRITERIA

1. Ordering

- 1.1 A registered nurse must complete the requisition for Schedule 8 drugs. This must include the ward number, drug, strength and quantity required. Any unused lines should be crossed out. The nurse ordering the drugs must sign (and print his or her surname and designation beside the signature) and date the requisition form.
- 1.2 A requisition book is kept on each ward, and must only be used by that ward. The requisition book must be kept in a locked cupboard. New requisition books should be obtained from the Ward Pharmacist.
- 1.3 Requisitions will be collected by a pharmacy staff member or delivered directly to the Pharmacy Department.

2. Checking

- 2.1 Two nurses will count all Schedule 8 drugs at least once every 24 hours - one of whom will be a registered nurse.

- 2.2 The entry in the register should be made in red ink and include the date, time, 'checked and correct' (or similar notation), signature of both nurses and the balance.
- 2.3 Any discrepancy must be reported to the Ward Pharmacist as soon as practicable. This will then be followed up as outlined in the Poisons Act and Regulations.

3. Prescribing and Administration

- 3.1 A Schedule 8 drug must be prescribed in accordance with the policy on Prescribing and Administration of Drugs to Neonates.
- 3.2 Every dose of a Schedule 8 drug will be entered in the Register and show:
 - ◆ the patient's name
 - ◆ the date
 - ◆ the time given
 - ◆ the amount taken from the stock
 - ◆ the amount (mg) and volume (mL) administered to the patient
 - ◆ the balance of stock remaining
 - ◆ the name of the medical officer prescribing the drug
 - ◆ the signature of the person who administered the drug
 - ◆ the signature of the person who checked the drug.
- 3.3 The persons administering the drug must also complete the register in indelible black ink. Their signatures will indicate that the drug has been administered and the remainder of any ampoule has been discarded correctly.
- 3.4 All intravenous narcotics must be given by a registered nurse.

4. Errors

- 4.1 Any entry written in error must not be altered, obliterated or cancelled in any manner. Correction fluids must not be used.
- 4.2 An incorrect entry must be marked with an asterisk (*) and corrected by an entry on the next available line to show the current balance and briefly explain the mistake. This entry will be in red ink, dated and signed by the two staff involved.
- 4.3 A record must be made in the Register if any drug is wasted.

5. Broken Ampoules

- 5.1 Any broken ampoule discovered whilst checking or administering from stock must be entered in the Register.
- 5.2 The entry must specify the date, time, 'ampoule broken' (or similar notation), number found broken, and balance. This entry will be in red ink, dated and signed by the two staff involved.
- 5.3 The Ward Pharmacist must be notified as soon as practicable and given the broken ampoule.

6. Transfer of Schedule 8 drugs between wards after hours

- 6.1 A registered nurse from the ward requiring the drugs must complete a requisition as described above in 1.1. The requisition must be completed in full and specify the supplying ward.
- 6.2 The ordering nurse must proceed to the supplying ward with the requisition, register and any remaining balance of the stock required.
- 6.3 The supplying nurse must check the requisition, to ensure that it has been completed correctly.
- 6.4 Supplying ward's register entry.

The nurse must remove the required amount from Schedule 8 Drug Cupboard and complete an outgoing entry in the supplying ward's register. This must include the date, time, ward to which the drug is being given, the requisition number, amount given, name of ordering nurse and balance remaining. The receiving and supplying nurse must then sign the Register entry. The entry must be in indelible black ink.

- 6.5 Receiving ward's register entry.

Before leaving the ward, the receiving nurse must sign the entry. The entry must be written in red ink so that it can be distinguished as an incoming entry.

7. Receipt

- 7.1 The pharmacist must supply the schedule 8 drugs and obtain a receipt as described in the Pharmacy Policy and Procedures Manual.
- 7.2 Drugs received from inter ward borrowing are covered in Section 6 above.
- 7.3 All Schedule 8 drugs must be secured in a locked cupboard.

8. Returns

- 8.1 Schedule 8 drugs no longer required, or out of date, should be returned to the Pharmacy Department.
- 8.2 A registered nurse must complete the requisition for Schedule 8 drugs (as stated in Section 1.1 above) giving all details regarding the drugs to be returned.
- 8.3 Additive syringes prepared for specific patients may be discarded by two nurses.

9. Registers and Requisition Books

- 9.1 The number of the ward to which both Register and Requisition book has been issued must be printed on the respective front covers.
- 9.2 Every effort must be made to keep books in good order and pages must never be removed.
- 9.3 Full books must be returned to Pharmacy. The Pharmacy Department is responsible for the issue of new Registers and Requisition books.
- 9.4 The different drugs entered in the Register should be specified in the index at the beginning of the Register. The current page number for each of the drugs should also be marked there.

9.5 Balances and page numbers must be documented when stock is either carried or brought forward.

10. Schedule 8 Drug Cupboard and Keys

10.1 The keys must remain in the ward or department at all times.

10.2 The Schedule 8 drug keys must always be in the personal possession of a registered nurse, pharmacist or doctor.

10.3 The shift coordinator should ascertain that the keys have been handed over to a registered nurse on the oncoming shift.

10.4 A person discovering that they have inadvertently removed the keys from the ward or department must return them promptly in person.

10.5 If the keys are missing, the clinical nurse consultant/clinical manager/nurse manager must be notified immediately in hours and the hospital after hours nurse manager notified after hours.

10.6 The chief pharmacist, as the accountable hospital officer must be notified as soon as practicable.

10.7 If deemed necessary, the lock to the Schedule 8 cupboard will be changed as soon as practicable.

Reporting of Adverse Drug Reactions

STANDARD: - All adverse drug reactions must be properly investigated and recorded in the patient's medical record and adverse drug cards sent to Pharmacy for reporting to the Australian Drug Evaluation Committee.

CRITERIA

1. **When there are signs of a suspected adverse drug reaction a medical officer, a nurse or a pharmacist must complete a notification card.**
2. Send the card to the Main Pharmacy - either through the internal mail system or by the Pharmacy orderly.
3. The doctor should affix a 'suspected/confirmed drug reaction' sticker to all four pages of the current medication chart (and circle 'suspected'). The doctor should also initiate any action required to counter the reaction.
4. Upon receipt of the notification card, the ward pharmacist will investigate the reaction.
5. If the reaction is confirmed:
 - (a) The ward pharmacist, in consultation with the registrar or consultant, will complete an adverse drug reaction sticker and affix it to the inside front cover of the patient's medical record. This must be signed and dated by the registrar or consultant (and countersigned by the ward pharmacist). A 'drug alert' sticker will be affixed to the front cover of the patient's medical record.
 - (b) If deemed appropriate, a report will be made to the Adverse Drug Reactions Advisory Committee in Canberra by the ward pharmacist. A copy of this report (together with the original notification card) is filed in the Pharmacy Department.
 - (c) The registrar/consultant responsible for the patient will inform the infant's general practitioner in the discharge summary.

- (d) The doctor will inform the parents of the adverse drug reaction. The ward pharmacist, in consultation with medical staff, will provide the parents with a card specifying details of the reaction before the infant leaves the hospital.
 - (e) The parents should be encouraged to purchase a Medic-Alert bracelet for their infant.
6. If appropriate, a Medic-Alert report form should be completed and forwarded to the Medic-Alert Committee Chairman.
 7. "Drug-alert - suspected/confirmed" stickers should be affixed to the infant's medication chart on any later admission.

Administration of Intravenous Narcotics to Neonates

STANDARD: - Intermittent doses or continuous infusions of intravenous narcotics may be administered by registered nurses to infants requiring pain relief and or sedation as long as they have completed a training program and been deemed competent to do so. Enrolled nurses may not give intravenous narcotics or care for an infant with a narcotic infusion.

A medical officer must prescribe the narcotic and all policies related to the administration and checking of drugs must be followed.

For non-ventilated infants requiring narcotics, resuscitation equipment must be available by the infant's cot and a medical officer must be in the unit.

Morphine sulphate is the narcotic of choice to give to neonates.

Intravenous morphine can only be given by registered nurses following the NCCU Narcotics Policy.

INDICATIONS

Infants exhibiting evidence of acute pain.

Ventilated infants requiring sedation.

Post operative infants.

Infants withdrawing from maternal narcotics abuse when alternative treatment has failed.

OBSERVATIONS

Respirations, heart rate, level of sedation need to be observed for the first 15 minutes following administration. At least one set of observations and a pre and post pain score (when appropriate) must be documented during this time.

NCCU Morphine Policy

INTERMITTENT IV ADMINISTRATION

Morphine ordered as per the NCCU Drug Protocols Manual.

PREPARATION

After the dose has been prescribed, prepared syringes of morphine can be obtained from Pharmacy, using a CIVAS form, or by staff making up the solution following the Neonatal Drugs Protocol Manual.

PRESCRIPTION

The prescription must be written on the drug chart in the appropriate section or on an IV narcotics form (6B ONLY) by a medical officer.

The dose must be written in weight per kg body weight. The drug must be diluted as per NCCU Drug Protocols Manual.

ADMINISTRATION

1. The dose is given over 3-5 minutes via the 3-way tap or injection port. The solution used to flush the IV after the dose is administered must be also included in the 3 to 5 minute giving time.
2. An IV dose of morphine should be administered at least 5 minutes before a procedure to allow the drug to take effect.
3. The dose may be repeated with a maximum of **two (2)** doses in 90 minutes.

If after the second dose the desired effect is not achieved, the infant should be reviewed by the prescribing doctor and/or the registrar. The infant may require a continuous narcotic infusion if the desired effect is not reached after the second dose.

Morphine Infusion Policy

1. INTRODUCTION

Narcotic infusions have proven a significant advance in management of acute pain. The technique provides superior analgesia, increased safety and avoids intramuscular injections. The analgesia is continuous without the peaks and troughs associated with intermittent analgesic techniques.

2. DOCUMENTATION

A medical officer ordering the infusion must prescribe the Narcotic Infusion Order on the appropriate form/medication chart.

Infusion rate, bolus doses and observations are documented on the neonatal observation chart.

3. EQUIPMENT

The narcotic infusion is delivered via a 3-way stopcock to the main intravenous infusion by an infusion device or through a separate IV site.

Because of the need for accuracy and the small volumes delivered narcotic infusions should only be delivered by a syringe pump using a valved giving set which does not allow over infusion if the syringe is disconnected from the pump.

An anti reflux valve should be placed on all mainline infusions to prevent accumulation of narcotic in the line if the cannula kinks or blocks.

4. PREPARATION OF NARCOTIC SOLUTION

For syringe pumps use the appropriate syringe type (usually a 50mL syringe) as indicated by the instructions provided with the pump.

Solutions may be obtained from Pharmacy during normal hours or prepared by medical or nursing staff when required. An additive label **must** be completed.

Morphine:

Follow dilution regimen as per NCCU Drug Protocols Manual.

5. ADMINISTRATION

The aim is to have an infant free of pain or in a settled state with stable cardio respiratory observations.

5.1 Loading dose

If the infant is in pain or requires sedation a loading dose is usually necessary to achieve an adequate therapeutic level. This may be administered by a registered nurse and titrated over 5-10 minutes until adequate analgesia is achieved. A medical officer must be in the unit when a loading dose is being administered.

5.2 Commencement of infusion

If a loading dose is not required a registered nurse may commence the infusion without a registrar being present in the unit.

5.3 Dosage Guidelines

As per NCCU Drug Protocols Manual.

5.4 Bolus doses

A bolus dose may be required when the infant is in pain or unsettled or 10 to 15 minutes prior to anticipated painful procedures. It is extremely important to ensure that the original rate is resumed once the bolus has been administered. Never leave the infant unattended during bolus administration. The usual bolus dose is equal to the hourly infusion rate.

When a bolus dose is ordered two nurses must be involved with the giving of the bolus dose, one of which must be a neonatal trained.

5.5 Administration of blood products during narcotic infusion

When intravenous access is difficult narcotic infusions can be given via a 3-way tap whilst blood is running as long as the line is connected to the 3-way tap close to the IV insertion site.

5.6 Administration of other drugs during narcotic infusion

Concurrent use of other sedatives and opiates, particularly by intravenous injection, can lead to life-threatening complications. Use of such drugs should be discussed with the consultant medical officer in charge of the unit.

5.7 Compatibility of other drugs during narcotic infusion

When the infant requires other intravenous medications, such as antibiotics, the narcotic infusion should be stopped unless compatibility between the drugs has been checked with Pharmacy. The narcotic should be stopped for the shortest period required for administration of the medication.

If the medication must be given by infusion, a bolus dose of narcotic beforehand should ensure that analgesia remains adequate. If the narcotic infusion must be interrupted for more than 30 minutes, a second intravenous site may be necessary.

5.8 Dose Adjustments

Rate changes should be recorded on the neonatal observation chart.

6. OBSERVATIONS

6.1 Routine observations

Any infant who has a morphine infusion running must have their heart rate, respiratory rate and oxygen saturation constantly monitored.

Observations must be recorded **hourly** on the neonatal observation chart. All abnormal observations must be documented. Documentation should also include the infant's general condition, level of analgesia, and conscious state.

The following respiratory rates are suggested as lower limits for **non-ventilated infants even infants on respiratory support such as prong CPAP.**

30 breaths per minute

If the respiratory rate drops below the designated minimum and the infant is exhibiting signs of **CNS depression such as increasing episodes of apnoea and bradycardia** the infusion must be stopped and a medical officer informed.

If there are serious concerns about the infant's condition, cease the infusion and initiate resuscitation and call a doctor to the unit. Initiate a “ **Code Blue Paediatric**” if the doctor is unavailable.

7. SUSPECTED OVERDOSE

In the case of a serious overdose, a medical officer should order Naloxone (Narcan) intravenously **in the smallest dose, which will raise the respiratory rate to the desired level without abolishing analgesia.** Follow the NCCU Drug Protocols Manual for the use of Naloxone.

1. Stop the morphine infusion.
2. Institute other resuscitation measures as necessary.
3. Notify medical officer.
4. When the patient's condition is stable, but not before one hour, recommence narcotic infusion at 1/3 - 1/2 previous rate and adjust dose as necessary.

8. DISPOSAL OF NARCOTIC FLUID

When the narcotic infusion solution is changed or discontinued, any remaining flask contents are to be discarded into the sink. Two nurses must witness this disposal.

Administration of Drugs not approved for use in Infants

On occasions, infants may require the prescription of drugs that have not been approved for use by the Therapeutic Goods Association (TGA). This may be a drug that has not been approved for use in infants or a drug that has not been approved for use in Australia.

The use and prescription of these drugs is controlled centrally from Canberra and will require the development and approval of a treatment protocol specific for that drug eg Nitric Oxide.

The Protocol will include:

- ◆ **strict guidelines on the use of the drugs**
- ◆ **registration of the infant with the TGA in Canberra before the drug can be used**
- ◆ **consent from parents.**

Any request for the use of such drugs needs to be discussed with the Chief Pharmacist.

REFERENCES:

King Edward Memorial and Princess Margaret Hospitals, Neonatology Clinical Care Unit (NCCU) Drug Protocols, December 1999

King Edward Memorial and Princess Margaret Hospitals, Neonatology Clinical Care Unit (NCCU) Neonatal Nursing Practice Manual, June 1999.

King Edward Memorial and Princess Margaret Hospitals, Pharmacy Policy and Procedures Manual, 2001.

King Edward Memorial and Princess Margaret Hospitals, Policy Manual, December 1996.

Princess Margaret Hospital for Children, Clinical Practice Manual, 1996