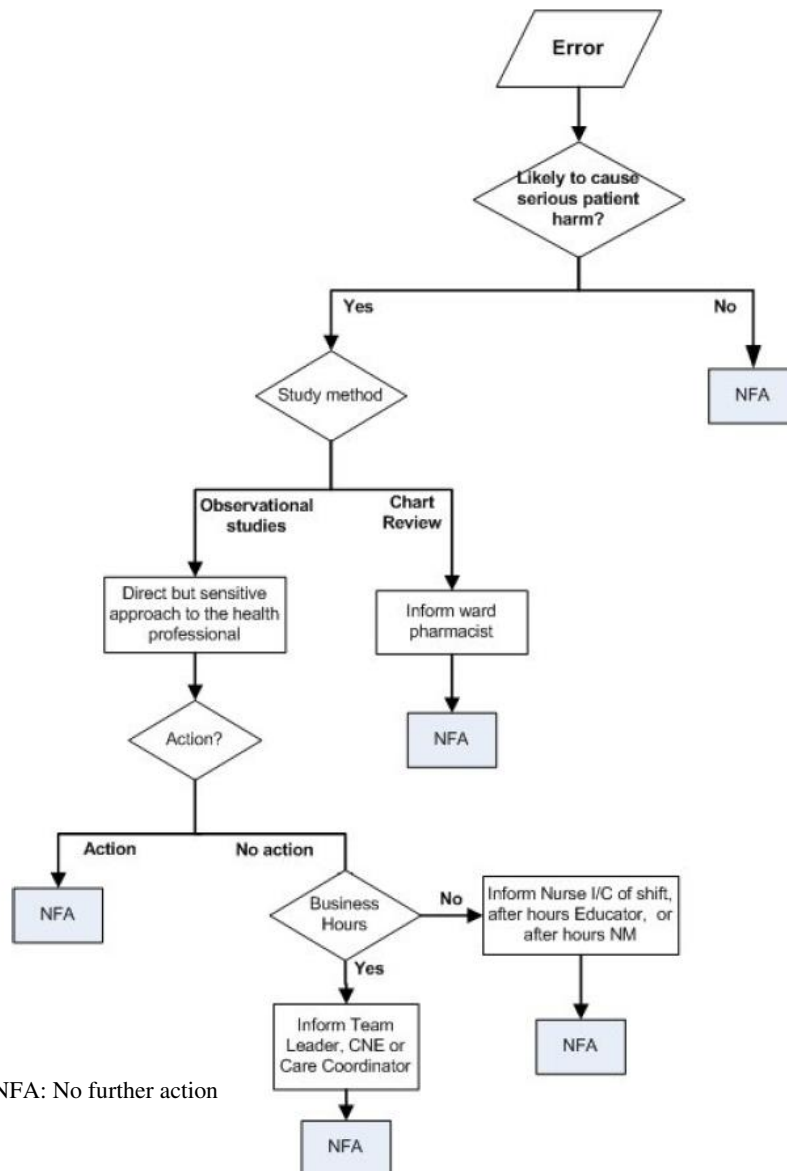


## Appendix 1 – Serious Error Protocol

Where a researcher noticed an error which potentially may lead to serious patient harm, they first decided whether the error was likely to cause serious harm to the patient or not. If they were concerned about potential consequences of an error but unsure about its potential to cause harm, they could contact the Team Leader or Nurse in charge on the ward to check. Researchers followed the decision tree below:



Examples of errors that may cause serious harm:

- Giving medication to a patient who has an allergy to that medication
- Giving the wrong drug or using the wrong IV additive
- Serious overdose eg giving methotrexate daily instead of weekly

Example of errors that would not be considered to cause serious harm:

- Procedural errors e.g. not taking a pulse before giving digoxin, not signing for a medication (exception: chemotherapy)
- Missed or late doses of medication (exception: chemotherapy)
- S4 and S8 procedural errors e.g. signing the DD book after medication is given

## Appendix 2 – Extracts from hospital policy regarding the administration of medications and the double-checking process

This document reflects what was regarded as safe practice by the Sydney Children's Hospital Network Policy, Procedure and Guideline Committee as at 01.04.2015 (Guideline No: 1/C/06:8232-01:09). However, as in any clinical situation, there may be factors which cannot be covered by a single set of guidelines. This document does not replace the need for the application of clinical judgement to each individual presentation.

Under hospital policy, this document must be read by all nursing staff working in clinical areas, and all medical staff. In addition, all Registered Nurses (RNs), Enrolled Nurses (not medication accredited) and Enrolled Nurses (medication accredited), including those employed on the casual pool, must have successfully completed the Mandatory Drug Calculation Test and performed 20 medication checks before they were allowed to check or administer medications.

Please observe the following key points when administering medication. Extra important requirements follow but this table includes important check points for the medication administration process.

I'm going to GIVE A DOSE of medication ...

- Is this the right patient?
  - o Always check the patient identification band!
  
- Do I have the right chart?
  - o Double check against the patient identification band.
  
- Just what am I giving?
  - o Can I read the drug name and dose clearly? Have I retrieved the correct product –does the name on the chart match the drug label? Have I measured the dose correctly – CHECK!
  
- Is it the right date and time to be giving this dose?
  - o Double check the order and previous administration signatures for notes
  
- Are there any special precautions?
  - o Check that allergies are recorded – ask parent or refer to notes if not, and confirm both the brand and generic name. Make sure this drug or similar isn't among the ones listed. Check dilution and administration rate for IV doses and double check pump settings.
  
- Am I about to give this dose by the correct route?
  - o Double check the prescribed medication. Ensure the prescribed route is available.
  - o All oral medications that require a syringe to deliver the medication must be in an oral syringe
  
- Is this a drug which requires a double check?
  - o If unsure, check with your team leader or look it up!
  
- Is there anything I'm unsure about?

**STOP!** Check everything again. If still unsure – discuss with a colleague. Also check the Hospital's Intranet – Drug Therapy menu item on front page: [http://chw.schn.health.nsw.gov.au/o/groups/drug\\_therapy/](http://chw.schn.health.nsw.gov.au/o/groups/drug_therapy/)

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#### 4.1 Administration of Medication – Policy

- All Registered Nurses (RNs) and Enrolled Nurses employed by CHW (including those employed on the casual pool) must successfully complete the Mandatory Drug Calculation Test and perform 20 medication checks ([Appendix V](#)) before they can check or administer any medications. It is recommended that all nursing students (undergraduates) successfully complete the Mandatory Drug Calculation Test
- Enrolled Nurses Role - Enrolled nurses can either be classified as a "Enrolled Nurse (Medication Accredited)" or "Endorsed Nurse (Non Medication Accredited)". Endorsement can only be given by the Nurses and Midwives Board of Australia (NMBA). All Enrolled Nurses are considered to be 'Medication Accredited'; those ENs who have not yet completed the required units to qualify to administer medications will have a notation on the register against their name which will read: *Does not hold Board-approved qualifications in administration of medicines*'. Refer to NSW MoH Policy "[Administration of Medications by Enrolled Nurses](#)".
- Before any nurse can administer any IV medication and then every two years they must undertake the mandatory Administration of Intravenous Medications Clinical Assessment and be deemed competent. (see [appendix IV](#))

#### 4.2 Nursing Grade - Checks and Administration guide

Nurse Grade	Can they Check?	Check with Whom	Can they Administer?
<b>AIN</b>	No	N/A	No
<b>Undergraduate Nurse – Pools</b> (employed by CHW but are 3 <sup>rd</sup> year nursing students)	Yes Can check medications via all routes (excludes S8 medication)	CHW RN or authorised casual pool RN Not with: - New graduates - EN (non-med accredited) NEVER ALONE	No
<b>Nursing students</b> (Undergraduate) (nursing students on clinical placement)	Yes Via all routes (excludes S8 medication) under the direct supervision of 2 RNs	2 CHW RNs or authorised casual pool RNs Not with: - New graduates - EN (non-med accredited) NEVER ALONE	Yes - under direct supervision of 2 RNs for all medication routes
<b>Trainee Enrolled Nurse (TEN)</b>	Yes Under the direct supervision of 2 RNs	CHW RN or authorised casual pool RN TEN CNE	Yes – under the direct supervision of 2 RNs
<b>EN (non-Medication Accredited)</b>	Yes Can check with an RN unscheduled, S2, S3 and S4 oral medications only. Cannot check: - standing orders - nurse initiated medications - phone orders - S8 drugs	CHW RN or authorised casual pool RN Not with: - New graduates	No

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Nurse Grade	Can they Check?	Check with Whom	Can they Administer?
<b>Enrolled Nurse (Medication Accredited)</b>	<p><b>Yes</b></p> <p><u>Can:</u></p> <ul style="list-style-type: none"> <li>- check S8 medications (except if S8 or S4D medications being loaded as a continuous infusion)</li> <li>- undertake the S4D and S8 Dangerous Drugs balance check with a RN</li> <li>- check IV additives in fluids</li> </ul> <p><u>Cannot check:</u></p> <ul style="list-style-type: none"> <li>- standing orders</li> <li>- nurse initiated medications</li> <li>- Phone orders</li> <li>- Inotropes</li> <li>- Potassium, muscle relaxants and midazolam being loaded as a continuous infusion</li> <li>- Blood products or PN</li> <li>- Cytotoxic chemotherapy</li> </ul>	<p>CHW RN or authorised casual pool RN</p> <p>Not with:</p> <ul style="list-style-type: none"> <li>- New graduates</li> <li>- EN (non-med accredited)</li> <li>- EN (med accredited)</li> </ul>	<p>Yes – with an RN</p> <p>Cannot administer:</p> <ul style="list-style-type: none"> <li>- S8 medications</li> <li>- Standing orders</li> <li>- Nurse initiated medications</li> <li>- Phone orders</li> <li>- Inotropes</li> <li>- Blood products or PN</li> <li>- IV additives</li> <li>- Cytotoxic chemotherapy</li> <li>- S4D infusions</li> <li>- Potassium, muscle relaxants and midazolam infusions</li> </ul>
<b>Agency EN</b>	No	N/A	No
<b>Agency RN</b>	Yes (RNs employed by a nursing agency can only check medications once successfully completing a SAMUEL drug calculation test)	Permanently employed RN to that ward or authorised casual pool RN	No
<b>Pool RN's (casual)</b>	Yes (once successfully completing a SAMUEL drug calculation test)	Permanently employed RN to that ward or authorised casual pool RN	Yes with the checker
<b>New Graduate RN (first 12 months)</b>	Yes Can check scheduled drugs (S4 and S8) including opioids and epidurals when deemed competent by the ward.	<p>RN permanently employed on ward, permanent ward pool staff, other 1<sup>st</sup> year RN after 6 months of employment</p> <p>Not with:</p> <ul style="list-style-type: none"> <li>- EN (med accredited)</li> <li>- EN (non-med accredited)</li> <li>- New graduate RN</li> <li>- Undergraduate AIN</li> <li>- 3<sup>rd</sup> year undergraduate nursing student</li> </ul>	<p>Yes with the checker</p> <p>Cannot administer S4 and S8 including opioids and epidurals until completed SAMUEL drug calculation test, performed 20 medication checks and deemed competent by ward.</p> <p>Cannot administer Nurse Initiated drugs within their 12 month program (with the exception of Middleton Ward)</p>
<b>RN (Permanently employed)</b>	Yes	All nursing grades	Yes with the checker

- The same nurse must prepare record and administer the medication ordered.
- Where medication is administered over a period of time, including intravenous infusions, the maintenance of the infusion may be carried out by more than one nurse, with adequate handover.

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- For IV medication, the medication is to be taken to the patient in an individual tray by both the administering nurse and the checking nurse.
- Prepare and administer one medication for one patient at any one time. This is to avoid any potential confusion of medication doses.
- No medication is to be left at the bedside. If it is not administered it must be taken back to be either destroyed or kept safely in the medication room.
- Two nurses must *independently* check all IV, IMI, subcutaneous and oral medications unless otherwise stated in section 4.4. An *independent* double check is a process in which a second nurse (or other health care practitioner e.g. pharmacist or medical officer) conducts a verification, which can be in the presence or absence of the first nurse or practitioner. In either case, the most critical aspect is to maximize the independence of the double check by ensuring that the first nurse does not communicate what he or she expects the second nurse to see, which would create bias and reduce the visibility of an error. Refer to Appendix VIII for further information.
- The two nurses must witness the administration of the medication and sign the medication order upon completion of the administration.
- Withheld or missed medications are to be documented on the medication chart using the code on the medication chart. If this omission is inadvertent, it is recommended that the clinician discovering this fact makes an IIMS entry via "Safety at Kids".
- Wherever possible administer the medication at the same/similar time and in a similar manner to how the parents/carer does at home.

#### 4.3 Calculation of Medication: formula

- Check strength of product in milligrams (mg) per millilitre (mL).
- The dose required (mg) is divided by the strength of product (mg/mL), therefore the formula is:

$$\frac{\text{Dose required (mg)}}{\text{Strength in stock (mg)}} \times \text{Volume in stock (mL)} = \text{Volume to be administered (mL)}$$

Note that Dose and Strength units must be in same terms (mg or microgram etc.)

e.g. Need 3mg dose and have 25mg/5mL mixture

$$\frac{3 \text{ (mg)}}{25 \text{ (mg)}} \times 5 \text{ (mL)} = 0.6 \text{ mL}$$

#### 4.4 Single Check Medications

Single check medications are those which only 1 RN is required to check, these medications are:

- Oral antipyretics
- Oral antibiotics
- Topical creams and ointments
- Oral vitamins
- Inhaled medications
- Oral antifungals

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- Laxatives
- Topical anaesthetic gels
- Ear drops
- Nasal drops
- Eye drops excluding preparations containing steroids

#### Abbreviations

CNE – Clinical nurse educator

EN – Enrolled nurses

S4 S8 – dangerous drugs of addiction such as opioids

DD Book – dangerous drug book where nurses must record details of the administration of these medications

NIMC – national inpatient medication chart

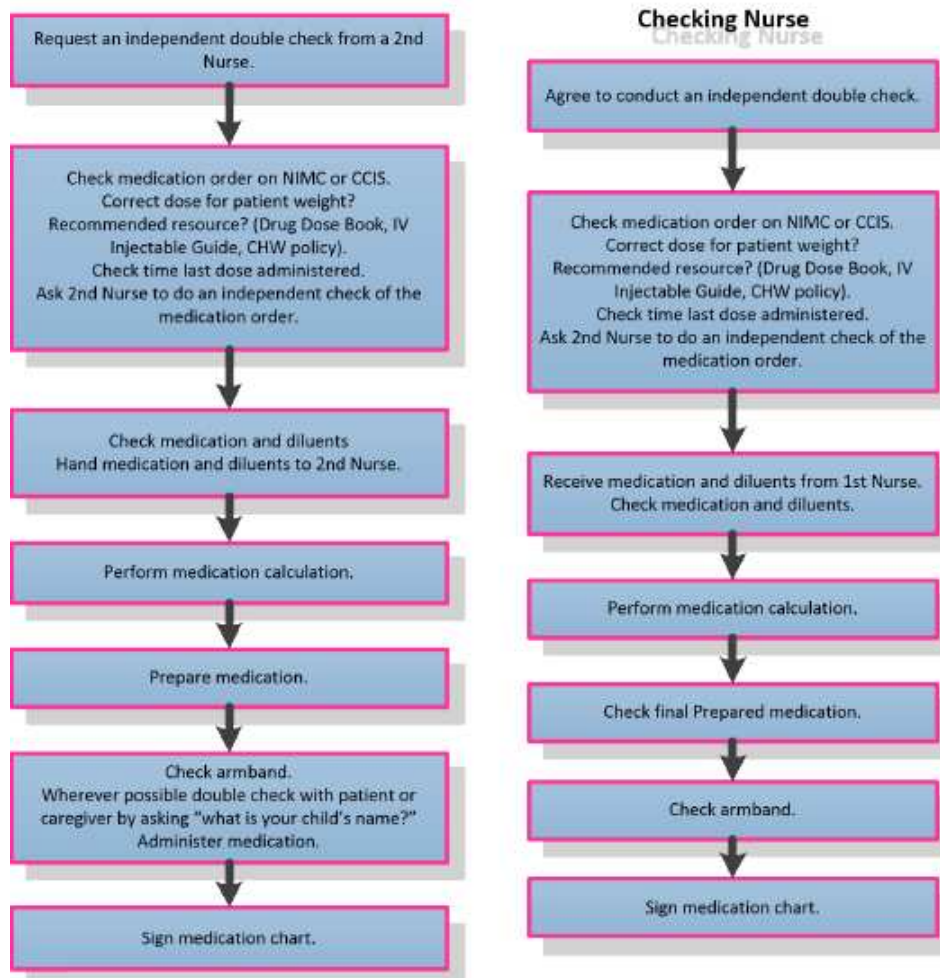
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## Appendix VIII: Independent Double Check: Algorithm

An independent double check is a process in which a second nurse (or other health care practitioner eg pharmacist or medical officer) conducts a verification, which can be in the presence or absence of the first nurse or practitioner. The double checking process does not finish at the point of preparing the dose, but rather at the point of administration of the medication, to the correct patient, in the correct way. The algorithm below describes the roles of the administering nurse and the checking nurse in a double checking process that is independent and includes all aspects of administration of medication.



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### Appendix 3 – Error categories and harm severity scale

Medication Administration Error	Description
Wrong Drug	Drug observed is not prescribed on patient's medication chart/eMM but is similar to the ordered drug.
Wrong Strength	The drug strength observed is not equivalent to the strength specified in the order or in any instructions documented by a pharmacist.
Wrong Formulation	Administration of the correct drug but in a formulation that is not equivalent to the formulation ordered.
Wrong Dose	The dose of the drug observed is different (regardless of variation) from the drug prescribed. Includes observed administration of an additional dose of a prescribed medication.
Wrong Route	The route of administration differs from the prescribed route or site/location specified.
Method taken for oral medications NOT according to instructions	Oral medications taken not according to specified instructions. Methods specified in POSSUM observed data are: <ul style="list-style-type: none"> <li>• Swallowed whole</li> <li>• Crushed</li> <li>• Chewed</li> <li>• Dissolved</li> <li>• Nasogastric or gastric tube</li> </ul>
Drug to Drug Incompatibility (Interaction)	Drug observed is not compatible with another drug in the same device (syringe/ container/bag).
Wrong Solvent/Diluent	Drug observed is not compatible with a solution in the same device (via same syringe/ container/bag, or IV access/line) OR is contrary to documented instructions in the medication order
Wrong Solvent/Diluent volume	Drug observed uses a volume of diluent/solvent that differs from the medication order, CHW policy OR manufacturers' instructions.
Wrong IV Additive	An observed drug is added to an IV solution that already contains another drug or fluid.
Wrong IV Additive Volume	The volume of an observed drug added to an IV solution that already contains another drug or fluid.
Wrong Intravenous Infusion Rate/ Bolus Duration	Administration of IV bolus or IV infusion faster/slower rate or shorter/longer duration than that prescribed or recommended.
Wrong Infusion Device	The intravenous drug administration device used is inconsistent with medication order or pharmacist's instruction or hospital guidelines.
Wrong IV Line Type	The IV line type used was not consistent with medication order, pharmacist's instruction, or hospital guidelines.
Contra-indicated for allergy	The drug observed has a documented patient allergy recorded in the medication chart/eMM.

#### Harm severity classification tool

The following definitions were used in the scale:

*Harm* is defined as “any impairment of structure or function of the body or mind such as disease or suffering and/or any deleterious effect arising there from”

*Monitoring* is defined as “any change in care pattern from the usual standard level of care including assessing urine output, general level of consciousness, or vital signs (heart and breathing rate)”

*Intervention* is defined as “any active treatment including blood tests, administering a drug, or general medical/surgical treatment”

Harm Severity Rating		Definition	Equivalent NCC-MERP Categories
1 Minimal	Minimal harm	An error occurred with no or minimal potential to cause harm to the patient and no need for a change in monitoring or intervention	A-C
2 Minor	Temporary harm, monitoring	An error occurred which has the potential to cause temporary harm to a patient and may require monitoring	D
3 Moderate	Temporary harm, intervention	An error occurred which has the potential to cause temporary harm to a patient and would require intervention	E-F
4 Serious	Permanent harm, intervention	An error occurred which has the potential to cause permanent harm to a patient and would require intervention	G
5 Life-threatening	Potential death	An error occurred which has the potential to result in the patient's death or would require intervention that is necessary to sustain life	H-I



## Appendix 4

## Medication administration errors by category and double-checking status

Error category	Double Checking Mandatory Number (rate per 100 administrations)		Double Checking Optional Number (rate per 100 administrations)	
	n=3,563		n=1,577	
	Single Checked (n = 231)	Double Checked (n = 3332)	Single Checked (n = 1161)	Double Checked (n = 416)
Wrong Drug	4 (1.7)	17 (0.5)	17 (1.5)	6 (1.4)
Wrong Strength	3 (1.3)	58 (1.7)	13 (1.1)	2 (0.5)
Wrong Formulation	4 (1.7)	92 (2.8)	13 (1.1)	5 (1.2)
Wrong Dose	40 (17.3)	422 (12.7)	337 (29.0)	72 (17.3)
Wrong Route	8 (3.5)	159 (4.8)	3 (0.3)	4 (1)
Method taken for oral medications NOT according to instructions	12 (5.2)	154 (4.6)	16 (1.4)	12 (2.9)
Contra-indicated for allergy	1 (0.4)	1 (0)	0 (0)	0 (0)
Drug to Drug Incompatibility (Interaction)	1 (0.4)	25 (0.8)	0 (0)	0 (0)
Wrong Solvent/Diluent (injectable & noninjectable)	18 (7.8)	292 (8.8)	10 (0.9)	12 (2.9)
Wrong Solvent/Diluent volume (injectable & noninjectable)	33 (14.3)	583 (17.5)	18 (1.6)	8 (1.9)
Wrong IV Additive	3 (1.3)	45 (1.4)	Not applicable as all IVs required double-checking	
Wrong IV Additive Volume	3 (1.3)	45 (1.4)		
Wrong Intravenous Infusion Rate/ Bolus Duration	29 (12.6)	441 (13.2)		
Wrong Infusion Device	3 (1.3)	45 (1.4)		
Wrong IV Line Type	1 (0.4)	8 (0.2)		
<b>Total</b>	<b>163 (70.6)</b>	<b>2387 (71.6)</b>	<b>427 (36.8)</b>	<b>121 (29.1)</b>