Standard of Practice: Medication Administration

Essential Information:
1. An independent double check is a purposeful process in which a second licensed healthcare practitioner performs a second independent verification of critical drug administration processes without any auditory or visual cues from another person. For most high alert medications, independent double-checks are performed prior to the initiation, at the time of any bag change or dose change, at the time of change in caregiver, and as deemed appropriate. 
2. In the ICU since patients are under close eye contact and cardiac monitoring two independent checks of changes in pump settings may not be optimal. Ex: titration of vasoactive drugs. 3 See Appendix A & B. For all units including the ICU the following high alert medications will have two independent double-checks at rate changes: insulin, heparin, and opioids administered as PCAs.
3. Use of 30 minute or 60 minute windows for medication administration can cause errors 4. Recommendations from ISMP state that facilities should indicate which medications are time sensitive and which permit a window of time before administration. For example, the following types of medications are time sensitive: time-critical medications, medications that need a peak and trough, chemotherapy, and PRN medications 4.
4. Based on ISMP recommendations, Clinical Center system changes to prevent medication errors (ex: use of standardized order sets and storage of medications such as not keeping the 1% lidocaine next to the 2% lidocaine with epinephrine) are supported. 
5. Reducing distractions for nurses administering medications needs to be a unit led initiative to help assure success. 5,8 See Appendix C.
6. Medication administration competency required.

I. Assessment:
A. Within 8 hours of inpatient admission, at discharge, on initial outpatient encounter, and all subsequent treatment episodes of care, a nurse assesses the following with the patient/family (See Nursing Department Policy, Documentation of Nursing Care): 9
   1. All medications currently prescribed (including date/time last taken, if appropriate), medications that may be on hold, and medications brought from home. Examples include: oral, parenteral, transdermal, transmucosal, etc. 10
   2. Herbals and other alternative agents.
   3. Allergies to food, drugs, animals, and other products.
   4. Food or drug contraindications relative to clinical trial protocol.
B. Upon admission, verify that any needed critical and time sensitive medications (ex: blood pressure medications) are ordered and administered in a timely way. 11
C. Prior to the administration of any medication, a nurse assesses and validates the following:
   1. Informed consent, if applicable.
   2. A relevant physical assessment and relevant laboratory data, if applicable.
3. Patient’s known allergies against the ordered medication.
4. The RN clarifies any unclear, incomplete, or illegible order with the Licensed Independent Practitioner prior to medication administration.
5. The 7 rights of medication administration against the medical order for the “right: patient, medication, dose, route, reason, time, and documentation.”
   1. Patient Identification – for patient safety and to accurately identify the “right patient,” the nurse asks the patient or caregiver to state their name and date of birth (DOB). The nurse will compare the inpatient identification band or outpatient NIH identification badge against hospital records and/or hospital-generated labels for patient’s first & last name and DOB.
      a. If a medication is to be administered by someone other than a nurse, e.g., the patient, their parent/guardian, or another caregiver (ex: intrathecal chemotherapy by the physician), the nurse assesses the individual’s understanding of the following and notifies the prescriber if there are concerns:
         i. Medication (name, purpose, potential and reportable side effects, contraindications)
         ii. Administration (frequency, routes, techniques for various routes)
         iii. Change in dosing regimen and/or scheduling
6. Whether a medication can be administered within its labeled expiration date/time.
7. Medical orders for treatment of potential extravasations and adverse drug reactions, if applicable.
9. Patient or caregiver knowledge of medication type, dose, action, and possible side effects.
10. Medication Dose and Infusion Rate Calculations – each practitioner independently gathers required information (e.g., height, weight, weight-based dosing ratios, medical orders, etc.) to perform required calculations and then, calculation results are compared for congruency.
11. Clinical Indication – each practitioner independently confirms that the ordered drug’s clinical indication is appropriate for the patient’s clinical condition.

II. Interventions:

**ALL MEDICATIONS**

A. When administering medications, the nurse should reduce potential risk factors for drug errors such as distractions (ex: units can agree to a “cone of silence” while nurses are reviewing, preparing and administering medications). See Appendix C for some examples of error prevention strategies.
B. Involve the patient in medication administration by providing drug fact sheets and informing patient of medication given, dose, etc.
C. When a medication is administered that has a high potential for an anaphylactic reaction, the following emergency supplies and relevant equipment are available on the patient care unit:
   1. Compatible flush solution and administration set connected to the patient’s VAD (in addition, a 3-way stopcock may be used).
   2. Oxygen
   3. Suction
   4. Vital sign machine
   5. Anaphylaxis treatment medications
D. High alert medications: Comply with safety strategies for the administration of high alert medications. 
   http://intranet.cc.nih.gov/pharm/pdf/HighAlertDrugs0108.pdf such as:
   1. independent double checks. In the ICU since patients are under close eye contact and cardiac monitoring two independent checks of changes in pump settings may not be optimal. Ex: titration of vasoactive drugs. See Appendix A & B. For all units including the ICU the following high alert medications will have two independent double-checks at rate changes: insulin, heparin, and opioids administered as PCAs.
   2. rate restrictions for certain agents such as potassium, per MAS M92-8: Intravenous Potassium Chloride Infusions.
   3. restrictions regarding preparation of IV medications on the unit, such as opiate and benzodiazepine parenteral solutions, per NPCS policy: Preparation of Parenteral Admixtures.
   4. required additional knowledge and competencies for administration of some agents (ex: intrathecal chemotherapy).
   5. need for additional monitoring, knowledge, and competencies for agents such as neuromuscular blockers (ICU).
   6. use of special tubing such as low sorbing tubing for Cyclosporine.
   7. use of the Guardrails Library when available (ex: Epoprostenol).

E. Verify that the patient took the medication. Medication is not left at the bedside except (ex: epinephrine auto-injector devices) as outlined in MAS Policy M95-4: Medication Self-Administration.

F. Medications brought from home:
   1. MAS M94-15: Policy and Procedure for Patient Medications Brought into the Clinical Center upon Admission
   2. MAS M87-6: Policy on Use of Investigational Drugs (FDA-approved IND) Brought into the Clinical Center by Patients for Therapeutic Use
   3. For controlled substances utilize tamper resistant bags per NPCS Policy: Handling of Controlled Substances

G. Suspected adverse drug reactions are reported in accordance with MAS M80-4: Suspected Adverse Drug Reaction Reporting.

H. Investigational/protocol/study drugs
   1. Utilize resources for administration of investigational agents including:
      a. MAS M80-3: The Use of Investigational or New Drugs in Clinical Research
      b. Pharmacy Policy 950.01.00: Handling Unit Dose Investigational Drugs
      d. NPCS Policy: Medication Administration: Documentation by Nurses
      e. Protocol details
   2. Refer to protocol for essential study related information (ex: charting exact time of drug administration and timing of any pharmacokinetics).

**ROUTES OF ADMINISTRATIONS**

A. Connections: Each nurse independently verifies all infusions (e.g., IV, subcutaneous, epidural, etc.) are accurately attached by manually tracing infusion tubing from the drug product through the infusion device to the site of infusion.

B. Intravenous Infusions/Push
   1. Infusion Pump Settings – each practitioner independently verifies that infusion pump settings are accurately set to deliver the ordered medication dose.
   2. For a high alert drug infusion, the independent double check process is completed prior to starting the infusion, when the infusion pump settings are changed, and at change of caregiver. In the ICU since patients are under close eye contact and cardiac monitoring two independent checks of changes in pump settings may not be optimal. Ex: titration of vasoactive drugs. See Appendix A & B. For all units
including the ICU the following high alert medications will have two independent double-checks at rate changes: insulin, heparin, and opioids administered as PCAs.

3. For IV Push medications, see MAS M94-7: Direct Intravenous Injection of Therapeutic and Diagnostic Agents (IV Push) and Pharmacy Policy: IV Push/Infusion Guidelines-Cardiac Drugs and the IV Push List.

C. Oral Medications:
1. Oral liquids that cannot be measured and administered accurately in a medication cup are measured and administered using an oral syringe (ex: oral syringe for oral liquids ≤ 10 ml).  

D. Injections:
1. Utilize the appropriate syringe with gradation markings that are consistent with the dose (ex: if administering 0.1 ml of a drug uses a tuberculin syringe that enhances the exact volume delivery).
2. Select appropriate sites taking into consideration age, weight, drug or type of therapy, needle size and length, and medication volume.
   b. Intradermal – (Used for anergy testing and PPD testing) Refer to the Mosby manual for appropriate needle size, site selection and technique. Label the site with the date and time. Document the administration as well as the read of the site.
   c. Intramuscular Injections: Select appropriate intramuscular sites taking into account risk factors. Any intramuscular site has the potential for injury such as femoral nerve or artery damage from the ventrogluteal site or damage to the axillary nerve from the deltoid site. Avoid sites such as the dorsogluteal site due to the risk of sciatic nerve injury. Refer to the Mosby manual for injection techniques.

HANDLING CONTROLLED SUBSTANCES

A. Oral and Intravenous Push Medication
1. Any unused portion of a drug removed from the locked storage device must be wasted in the presence of a nurse witness. See NPCS Policy: Handling of Controlled Substances, which describes discarding the solid medications by flushing and liquid medications into a drain with running water.
2. If a controlled substance is removed from the locked storage device but is not needed and the package is still intact, the drug is returned to the locked storage device. This transaction does not require a witness.

B. Infusions
1. Refer to the SOP: Care of the Patient Receiving a Patient Controlled and/or Continuous Analgesic Infusion.
2. When a controlled substance infusion is started an independent double check is required.
3. If a controlled substance is removed from the locked storage device but is not needed and the package is still intact, the drug is returned to the locked storage device. This transaction does not require a witness.
4. For continuous IV infusions, administration sets with free-flow protection are used with an infusion device.
5. When appropriate and available, electronic channel labels and Guardrails™ should be utilized with infusion pumps (see SOP: Care of the Patient Receiving an Intravenous Infusion).

C. Transdermal
1. When a transdermal controlled substance is removed from a patient, it is cut into several pieces and discarded in a sharps container for patient/visitor safety in the presence of a witness.
D. Transmucosal
1. The handling of a fully consumed transmucosal unit is discarded in a sharps container for patient/visitor safety. A partially consumed transmucosal unit is dissolved in running hot water in the presence of a nurse or authorized witness. The handle is discarded in a sharps container. A nurse additionally documents in the medical record and locked storage device or pharmacy controlled substance form that the administered drug was “partially consumed.”
2. An opened but unused transmucosal unit is dissolved in running hot water in the presence of a nurse or authorized witness. The handle is discarded in a sharps container.

MEDICATION LABELS:
A. Only properly labeled medications can be administered.
B. Per the NPCS Policy: Preparation of Parenteral Admixtures, all parenteral drug products prepared by a nurse for administration are labeled with a fully completed Clinical Center approved “Medication Added” label, containing the patient’s name and DOB, drug, amount, initials of the nurse who prepared the admixture, date of preparation, and expiration date/time. All intravenous piggybacks (IVPB) and large volume parenterals (LVP) prepared by a nurse for administration must also be labeled with the base solution and infusion time. (An IVPB is classified as ≤ 250 mL, and an LVP is classified as > 250 mL.) An exception to this may occur in a life-threatening situation when labeling of a drug product may be abbreviated and then updated when the patient is stabilized.
C. All IV solutions without admixtures must be labeled with a fully completed Clinical Center approved “IV Bag Label” containing expiration date/time, patient admission label, infusion start date/time, and nurse’s initials.
D. Any time one or more medications are prepared but not administered immediately, the medication container is appropriately labeled. A container can be any storage device such as a plastic bag, syringe, bottle, cup, or box which can be labeled and secured in such a way that it can be readily determined that the contents are intact and have not expired. 19
E. When a drug that requires an independent double-check is prepared for administration by a nurse, the initials of both licensed health care professionals participating in the independent check process are recorded on the “Medication Added” label. For “High-alert” medications, the nurses who performed the independent check may write their initials on the label. 2
F. Each practitioner independently compares the medication product label on the container and accompanying documents against the active medical order (e.g., CRIS on-line or current CRIS printout) for patient’s name and DOB, drug name, dose, concentration, route, date/time of administration, and expiration date. When the commercial drug vial is available to the nurse, e.g., insulin, each practitioner independently compares the commercial label against the medical order for drug name, concentration, and expiration date. See MAS M93-13: Policy for the use of Multiple dose and Single Dose Vials for Injection.
G. Syringes or drugs placed in other than their original container require a label (ex: liquid medication placed in oral syringe). 19, 21 The label should not obscure syringe scale or the name of medication but should permits observation of gradation lines of the syringe. 19
H. At the bedside, each practitioner independently compares the drug product label against the inpatient’s ID bracelet for the patient’s name and DOB. In the ambulatory care setting, the patient’s stated full name and DOB are compared against information recorded in CRIS.
I. Transdermal medication patches are labeled with the date and time they were placed on a patient and the initials of the nurse.
SOP: Medication Administration  
Approved by NPC on September 15, 2011

**VACCINATIONS**
A. Prior to administering a commercially manufactured vaccine, give the patient/caregiver a copy of the Vaccine Information Statement. Vaccine Information found on the Pharmacy web site under patient education: vaccine information.
B. Assess for any contraindications to vaccine administration (ex: live virus vaccine and specific immune suppressed conditions) and contact the LIP for any concerns or contraindications for immunizations.  

**PASS MEDICATIONS (Ordered as Take Home Medications)**
A. Prior to going on pass, a nurse reviews the current pass medication list with the patient.
B. Pass medication is dispensed from pharmacy (see MAS M81-6).
C. On return from pass, a nurse determines with the patient/family if scheduled medications were taken as prescribed and if any adverse effects were experienced.
D. Controlled substances: CRIS generated order requisition form (which substitutes for a prescription) must be signed by the LIP and given to the patient or caregiver.

**DISCHARGE**
A. At the time a patient is discharged from the Clinical Center, all medications brought from home are returned to the patient.
B. Medications not returned to a patient at discharge are managed based on drug type:
   1. Non-hazardous non-controlled medications: are destroyed by discarding in the proper hazardous waste container (ex: solid oral medications should be placed in a yellow chemo waste bucket).  
   2. Controlled substances are handled in accordance with the NPCS Policy: Handling of Controlled Substances, including disposal by flushing or discarding into a drain with running water with a nurse witness or authorized. Hazardous agents are returned to the pharmacy according to MAS M94-15.
   3. Investigational medications are returned to the pharmacy for management according to MAS M94-15 and Pharmacy Policy 926.
C. Controlled substances: CRIS generated order requisition form must be signed by the LIP and given to the patient or caregiver.

**PATIENT EDUCATION**
A. Patient/Family Education is provided by a nurse, LIP, and/or a pharmacist.
B. The following information is reviewed with the patient/family, as appropriate:
   1. Medication name, dosage, and schedule.
   2. Route of administration.
   3. Medications and foods to avoid.
   4. Common side effects to expect and actions to take if experiencing these side effects.
   5. Dosing administration techniques and devices if appropriate: For example, the nurse demonstrates and has the patient return demonstrate the appropriate dosing device type and use as indicated (ex: if giving Erythropoietin, teach about the proper syringe size with appropriate
markings). For patients receiving liquid oral medications ensure that parents and or caregiver understand drug label instructions and can demonstrate specific dosing devices (ex: oral dose syringe with appropriate markings). Oral syringes should be sent home with patients/families/caregivers.

6. Refill information (if authorized by prescriber).
7. Printed patient medication handout upon request or as needed.

C. If the patient, the nurse, or the pharmacist identifies concerns regarding the prescribed medication(s), the LIP is notified.
D. If there is a concern that a patient cannot self-administer a medication, the LIP is notified. The patient either returns as needed for drug administration by a nurse and/or remedial education is provided to the patient/family.

III. Documentation:

A. The following elements are documented in the approved electronic record and/or other approved medical record form:

1. Medication history obtained (including medication name, dose, route, frequency, and date/time last taken), as part of the medication reconciliation process.
2. Medication administered including:
   i. patient’s name
   ii. medication name, dose, concentration, and route
   iii. date and time of administration. A medication should be administered as close to the ordered time as possible. When a drug is administered significantly before or after the scheduled administration time (based on drug type), a rationale for early/late administration must be documented.
   iv. rate of infusion, as indicated
   v. whether or not a medication was given and a rationale for not giving a prescribed medication
   vi. a patient’s response to a medication, if applicable

B. The additional following elements are recorded in the approved electronic record and/or other approved medical record form, as appropriate:

1. Independent double checks are recorded in the MAR and or chemotherapy flow sheets in the electronic record.
2. Intradermal tests (such as anergy or PPD testing) require both the administration and the read to be documented in the MAR.
3. When the electronic documentation system is not operating, the above elements are recorded on a Nursing Progress Note (Standard Form 510) or Outpatient Progress Note.
4. Medication administration is not documented while a patient is on pass. On return from pass, a nurse will document the patient’s report of self-administered medications and any adverse effects they experienced.
5. When patients are discharged or released on pass with an ambulatory pump infusion, a nurse records the name of pump, serial number, status (discharge or pass), and date of issue and return.
6. Patient/Family teaching provided is documented in the approved electronic record, including:
   i. Assessment of competency to self-administer medication, if appropriate including use of dosing devices such as oral syringes.
   ii. Summary of information taught, e.g., medication name, dose, frequency, route, potential and reportable side effects, and strategies to manage side effects.
7. Blood-based products (ex: Immune globulin) and vaccine immunizations
   i. Product’s lot number
ii. Manufacturer’s name
iii. Vaccine Information Statements including date of edition and date provided to a patient

8. Medications Brought from Home
   i. Medications surrendered and not used during the inpatient stay are documented in the approved electronic record and/or other approved medical record form.
   ii. Medication can be administered from a patient’s own supply only if it is specifically authorized in a medical order and the medication has been identified by pharmacy. This medication is documented in the same manner that Clinical Center formulary medications are documented.
   iii. Documentation of controlled substances brought from home is accomplished in accordance with the NPCS Policy: Handling of Controlled Substances.
   iv. Medications disposed of or returned to a patient at the time of discharge from the Clinical Center are documented in the approved electronic record and/or other approved medical record form.

IV. References:

V. Contributing Standard of Practice and Policies

1. NPCs POL: Documentation of Nursing Care
2. MAS Policy M92-8: Intravenous Potassium Chloride Infusions
3. MAS Policy M95-4: Medication Self-Administration
4. MAS M94-15: Policy and Procedure for Patient Medications Brought Into the Clinical Center Upon Admission
5. MAS M87-6: Policy on Use of Investigational Drugs (FDA-approved IND) Brought into the Clinical Center by Patients for Therapeutic Use
6. NPCs POL: Handling of Controlled Substances
7. MAS M80-4: Suspected Adverse Drug Reaction Reporting
8. MAS M80-3: The Use of Investigational or New Drugs in Clinical Research
9. Pharmacy Policy 950.01.00: Handling Unit Dose Investigational Drugs
10. NPCs POL: Medication Administration: Documentation by Nurses
11. MAS M93-13: Policy for the use of Multiple dose and Single Dose Vials for Injection
12. MAS M94-7: Policy Direct Intravenous Injection of Therapeutic and Diagnostic Agents (IV Push)
13. Pharmacy Policy: IV Push/Infusion Guidelines-Cardiac Drugs and the IV Push List
14. NPCs POL: Handling of Controlled Substances
15. SOP: Care of the Patient Receiving a Patient Controlled and/or Continuous Analgesic Infusion
16. SOP: Care of the Patient Receiving an Intravenous Infusion
17. NPCs Policy: Preparation of Parenteral Admixtures
18. Pharmacy Policy 926
19. MAS M81-6: Guidelines for the Dispensing of Drugs to Outpatients and the Discharged Patient
SOP: Medication Administration
Approved by NPC on September 15, 2011

Approved:

/s/
Clare Hastings, RN, Ph.D., FAAN
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/s/
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Formulated:
Implemented: 11/2003
Appendix A

An independent double check is performed with the following drug administration processes; all discrepancies are resolved prior to the initiation of any high alert drug found on the High Alert Medication List on the pharmacy website.

<table>
<thead>
<tr>
<th>WHEN TO PERFORM INDEPENDENT DOUBLE-CHECKS</th>
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<tbody>
<tr>
<td>Clinical Indication</td>
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<tr>
<td>---------------------</td>
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<tr>
<td>Prior to Initiation or Administration</td>
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<tr>
<td>Change in Bag</td>
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<tr>
<td>Change in Dose or Concentration</td>
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<tr>
<td>Change in Caregiver</td>
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</tbody>
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* In the ICU since patients are under close eye contact and cardiac monitoring two independent checks of changes in pump settings may not be optimal. Ex: titration of vasoactive drugs. ³ See Appendix A & B. For all units including the ICU the following high alert medications will have two independent double-checks at rate changes: insulin, heparin, and opioids administered as PCAs. ³, ²⁸
Appendix B
Objectives of Independent Checks

Objectives of the independent double checks: The objectives of the independent double check are to increase the visibility of an error and to decrease the risk of “confirmation bias.” “Confirmation bias” is an unconscious tendency to confirm preconceived notions about data and other information. “Confirmation bias” can occur when a person double checks the work of another using verbal or written cues supplied by that person (e.g., increasing the risk of confirming invisible errors as accurate) rather than independently gathering and interpreting the data (e.g., increasing the likelihood of making errors visible).
### Appendix C

**UNIT STRATEGIES TO REDUCE DISTRACTIONS DURING MEDICATION ADMINISTRATION**

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Details of Strategy</th>
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<tbody>
<tr>
<td>Create a “cone of silence” during medication activities</td>
<td>Decrease talking or unnecessary noise in medication preparation area by establishing a culture of silence within preparation and checking areas. Consider posting silence signs in select areas of the unit where medication orders or medications are checked or prepared by nurses.</td>
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<tr>
<td>Provide coverage of phone calls or non-emergent pages during mediation administration activities</td>
<td>Consider allotting a specific interval of time (ex: 20-40 minutes) for nurse to review medications without distractions (ex: phone calls) during the shift. This intervention is sometimes referred to as a “Med Pass Time Out”. Utilize ancillary staff or peers to assist with patient calls or requests and phone calls.</td>
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<tr>
<td>Use “No Interruptions” vests or badges for nurses during medication preparation activities</td>
<td>Units may decide to use a symbol of nurse activities for medication activities such as a badge or vest to alert the team to nurse need for no distractions while reviewing, preparing, or administering medications.</td>
</tr>
<tr>
<td>Establish a unit culture of supporting nurses in reduction of distractions during medication activities</td>
<td>Individual patient care units can decide whether their unit will support a culture of no interruptions during nurse activities surrounding medication preparation and administration. Nurses can agree to share the responsibility to cover for each other during medication related activities. Implementation of the new culture can be implemented on each unit with the use of posters, educational sessions, newsletters, staff meeting agendas, communication with team members, and other initiatives based on unit preference.</td>
</tr>
<tr>
<td>Evaluate the rate of medication errors before and after institution of strategies to reduce distractions</td>
<td>Consider auditing ORS related medication errors before and after the establishment of strategies to reduce interruptions to nurse during medication activities.</td>
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