Safe Medication Administration Preparation Guide
C.O.R.E Essentials

As a new IU Health employee, a portion of your orientation will focus on Safe Medication Administration practices. You will participate in a Safe Medication Administration Assessment during Phase 1 of C.O.R.E. Essentials. This packet contains some guidance for preparation for that activity, a list of Safe Medication Administration resources available to IU Health employees, as well as a set of practice questions.

Please take the opportunity to review and prepare. You may also use a calculator and the enclosed conversion chart.

The Assessment will include several key points of Safe Medication Administration practices expected at IU Health. Such as those listed below:

A. Proper use of Decimals
B. Metric system
C. Converting measurements
D. Intravenous infusion/push rates
E. Medication Compatibility
F. Do Not Use Abbreviations (DNUA) and Appropriate substitutions
G. The 5 +2 Rights of Medication Administration
H. High Alert Medication Practices at IU Health
I. Requirements of Patient Identification and Allergy Confirmation at IU Health
J. Appropriate Patient Education surrounding Medications
K. Nursing Considerations and Interventions surrounding Medications
L. Identification and Confirmation of Patient Allergies
M. Identification and usage of Approved IU Health Resources and Equipment

The 5 +2 Rights of medication Administration:
At IU Health any employee who administers medication is responsible for utilizing the 5+2 Rights with every dose. While we do employ some technology to assist with this process, nothing replaces the health care professional at the bedside. You are expected to know and use the following 5+2 Rights as a consistent practice for Safe Medication Administration:

1. The Right Patient
2. The Right Medication
3. The Right Dose
4. The Right Route
5. The Right Time
6. The Patient’s Right to Refuse
7. The Right Documentation
Patient Identification:
At IU Health, a minimum of 2 patient identifiers should be used prior to every medication dose. Appropriate Patient Identifiers are:
1. Patient Name
2. Patient Medical Record Number
3. Patient Date of Birth

Resources available at IU Health:
Through the PULSE PAGE (NURSE PAGE):
Lexicomp
Micromedex
IV Compatibility Search
High Alert Medications Policy (MD 1.34AP)
DNUA List:

<table>
<thead>
<tr>
<th>Indianapolis Coalition for Patient Safety in Hospitals</th>
<th>“DO NOT USE” Abbreviations List</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DO NOT USE</strong></td>
<td><strong>Approved Alternative</strong></td>
</tr>
<tr>
<td>U, I.</td>
<td>Units, International Units</td>
</tr>
<tr>
<td>MgSO4, MAG</td>
<td>Magnesium Sulfate or Magnesium</td>
</tr>
<tr>
<td>MSO4, MS</td>
<td>Morphine Sulfate, Morphine</td>
</tr>
<tr>
<td>pg</td>
<td>mcg</td>
</tr>
<tr>
<td>QD</td>
<td>Daily</td>
</tr>
<tr>
<td>QOD</td>
<td>Every other day</td>
</tr>
<tr>
<td>cc</td>
<td>ml</td>
</tr>
<tr>
<td>A.S.</td>
<td>Left ear</td>
</tr>
<tr>
<td>A.D.</td>
<td>Right ear</td>
</tr>
<tr>
<td>A.U.</td>
<td>Both ears</td>
</tr>
<tr>
<td>C.S.</td>
<td>Left eye</td>
</tr>
<tr>
<td>C.D.</td>
<td>Right eye</td>
</tr>
<tr>
<td>C.U.</td>
<td>Both eyes</td>
</tr>
<tr>
<td>Ambivalent Duration (x10d)</td>
<td>Indicate specific number of doses or days</td>
</tr>
<tr>
<td>Do NOT write a zero AFTER a decimal (example 2.0)</td>
<td>Write whole numbers without a decimal (example 2)</td>
</tr>
<tr>
<td>Do NOT leave a blank space BEFORE a decimal (example .25)</td>
<td>Write a zero BEFORE a decimal (example .25)</td>
</tr>
</tbody>
</table>

Ensuring patient safety and avoiding medication errors is the goal of avoiding dangerous abbreviations

Through the Methodist Medical Library:
Math for nurses: a pocket guide to dosage calculation and drug preparation/Mary Jo Boyer; consultant, Elaine Dreisbaugh.

Radcliff & Ogden’s calculation of drug dosages: an interactive workbook/Sheila J. Ogden.
Practice Problems

6 kg = _________________ lbs  10 lbs = _________________ kg
20 kg = _________________ lbs  48 lbs = _________________ kg
6 oz = _________________ ml  45 mL = _________________ oz
½ oz = _________________ ml  120 mL = _________________ oz
4 tsp = _________________ ml  10 mL = _________________ tsp
½ tsp = _________________ ml  5 mL = _________________ tsp

Dosage Calculation Examples:

Below are some examples of different calculation formulas that may be helpful to review. You may know another formula that you’re used to using . . . . . . that is perfectly fine. Use what works for you.

Let’s look at an example question worked out using several different formulas:

Lasix 18 mg IV is ordered. The ampule is labeled 10 mg/1 mL. How many mL’s would you give?

Formula 1) \[
\frac{\text{dosage available}}{\text{quantity available}} = \frac{\text{dosage desired}}{(\text{quantity desired})}
\]

Step 1: \[
\frac{10 \text{ mg}}{1 \text{ ml}} = \frac{18 \text{ mg}}{x}
\]

Step 2: \[
10x = 18 \quad \text{use cross multiplication}
\]

Step 3: \[
\frac{10x}{10} = \frac{18}{10} = x = 1.8 \text{ ml}
\]

Formula 2) \[
\frac{\text{dosage desired}}{\text{dosage available}} = \frac{x}{\text{quantity available}}
\]

Step 1: \[
\frac{18 \text{ mg}}{10 \text{ mg}} \times 1 \text{ ml}
\]
Step 2: \[\frac{18 \text{ mg}}{10 \text{ mg}} = 1.8 \times \frac{1 \text{ ml}}{10 \text{ mg}} = 1.8 \text{ ml}\]

Formula 3) \[\frac{\text{dosage desired}}{\text{quantity available}} \times \frac{\text{dosage available}}{\text{quantity available}}\]

Step 1: \[\frac{18 \text{ mg}}{10 \text{ mg}} \times \frac{1 \text{ ml}}{10 \text{ mg}} = \frac{18 \text{ mg} \times 1 \text{ ml}}{10 \text{ mg} \times 10 \text{ mg}}\]

Step 2: \[18 \times 1 = 18\] multiply across the top row and bottom row
\[\times 10 = 10\]

Step 3: Divide bottom into top \[\frac{18}{10} = 1.8 \text{ ml}\]

**IV Drip Rate Calculations**

Below is an example using the IV drip rate formula of:

\[\text{gtt rate or ml/min} = \frac{\text{ml (ordered time)} \times \text{drip factor}}{\text{time in minutes}}\]

Let's look at an example question using this formula:

The order reads D5LR to infuse at 125ml/H. The macrodrip, primary tubing set delivers 15gtt/ml. How many drops per minute are needed to deliver the ordered dose?

Step 1: \[\frac{125 \text{ ml/hour}}{60 \text{ minutes}} \times \frac{15 \text{ gtt/ml}}{1 \text{ ml}}\]

Step 2: \[\frac{125 \times 15}{60} = 31.3 \text{ gtt/min}\]
PRACTICE MATH PROBLEMS

A medication order is listed at the beginning of each problem. Please figure the correct dosage to be administered in the following problems and place your answers on the numbered blank answer sheet.

1. All answers must be reduced to the lowest terms and expressed in correct annotation.
2. Exact answers are required. Label answer with measurement unit (ml, tablet, gtt/min, etc.)
3. If you are expressing a fractional answer in the form of a decimal, round off to tenths.
4. In figuring the dosage for a tablet preparation and the answer comes out to be ½ of a tablet, you may assume for this exam that the tablet is scored into halves.
5. Calculators and the conversion chart may be used.

Practice Applications (Show all work)

1. A baby weighs 6000 gm. How many kg does he weigh? _______________________

2. Chloramphenicol 60 mg is ordered. The vial is labeled 1 gm/10 ml. How many ml would you give? __________________

3. Lanoxin 0.02 mg is ordered. The bottle is labeled 50 mcg/ml. How many ml would you give? _____________

4. Lasix 18 mg IV is ordered. The ampule is labeled 10 mg/ml. How many ml would you give? _________________

5. Ampicillin is labeled 250 mg/5 ml and comes in a bottle containing 120 ml. A child is discharged on 250 mg q 6 hours. How many tsp. would you instruct the mother to give every 6 hours? __________________

How many days will the bottle last if the child receives the medicine q 6 hours? _______________

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6. Your patient is 5 years old and weights 40 pounds. The doctor orders Tylenol 10mg/kg. The bottle is labeled 160 mg/5ml. How many ml of Tylenol would you give? ____________

7. The doctor ordered Nafcillin 640 mg IV q 6 hours. The bottle comes labeled Nafcillin 1 gm/4 mls. How many ml would you give? ______________

8. Lanoxin/Digoxin 60 mcg is ordered. The bottle is labeled 50 mcg/ml. How many ml would you give? __________________

9. Tylenol elixir comes 325 mg per 12.5 ml. The doctor ordered 260 mg. How many ml would you give? __________________

10. IV order reads to infuse one liter of D10W + 40 mEq NaCl/L and 4 mEq KCl/L to run at 14 mL/hr. The soluset delivers 60 gtts/ml. How many drops per minute are needed to deliver the ordered dose? ______________

11. The order reads infuse 40 meq of KCl in 500 mL D5W over 5 hours using microdrip tubing (60 gtts/ml). How many drops per minute are needed to deliver the ordered dose? ____
12. The physician has ordered potassium penicillin G 125,000 units by injection for your patient. You have available a vial of powdered potassium penicillin G labeled 1,000,000 units. Please solve using one of the dilutions using the label below.

A. Which diluent amount did you select? ______________________

B. What volume of the final concentration would you administer? __________

Preparation of solution:

<table>
<thead>
<tr>
<th>Diluent Added</th>
<th>Final Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.6 ml</td>
<td>100,000 units/ml</td>
</tr>
<tr>
<td>4.6 ml</td>
<td>200,000 units/ml</td>
</tr>
<tr>
<td>3.6 ml</td>
<td>250,000 units/ml</td>
</tr>
</tbody>
</table>

13. The physician has ordered Prednisone 12.5 mg to be given orally. Available are Prednisone in each of the following dosages. The fewest number of whole tablets needs to be given. What combination of the tablets would you give?

PREDNISONE TABLET, USP
LOT NO: C6J2598
EXP DATE: JUN 05
Mfg. for: SCHEIN
FLORHAM PARK, NJ 07932 USA

PREDNISONE TABLET, USP
LOT NO: C6K2813
EXP DATE: AUG 05
Mfg. for: SCHEIN
FLORHAM PARK, NJ 07932 USA

PREDNISONE TABLET, USP
LOT NO: 962429
EXP DATE: OCT 05
Mfg. for: SCHEIN
FLORHAM PARK, NJ 07932 USA

___________ tab    ___________ tab    ___________ tab

14. How much medication is in the syringe filled to the arrows below? _____
15. How much medication is in the 1 ml TB syringe below as indicated by the arrow?_____

IU Health provides oral syringes as Safe Medication Administration devices. The amber color and non-leur tips which are not compatible with IV access ports, allow staff to differentiate these “oral only” syringes. For Safe Medication Administration, oral solutions should be drawn up in an oral syringe.
The following example illustrates the type of exercises on the Safe Medication Administration Assessment

<table>
<thead>
<tr>
<th>Medication Name</th>
<th>Medication Dosage</th>
<th>Dosage Calculation (How many mL’s, tabs or gtts?)</th>
<th>Side Effects/ Adverse Reactions</th>
<th>Nursing Implications</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ferrous Sulfate 325mg Tablets</td>
<td>Ordered Dose: 650mg</td>
<td>The nurse will give 2 - 325mg tablets</td>
<td>Abd pain, nausea, constipation, diarrhea, black colored stools</td>
<td>Do not crush</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Do not take within 2 hours of taking an antacid</td>
<td>Take 1 hour before or 2 hours after coffee, dairy, or eggs</td>
<td></td>
</tr>
</tbody>
</table>

Answer Key

Practice Problems

6 kg = _______ 13.2 _________ lbs
20 kg = _______ 44 _________ lbs
6 oz = _______ 180 _________ ml
½ oz = _______ 15 _________ ml
4 tsp = _______ 20 _________ ml
½ tsp = _______ 2.5 _________ ml

10 lbs = _______ 4.5 _________ kg
48 lbs = _______ 21.8 _________ kg
45 ml = _______ 1 1/2 _________ oz
120 ml = _______ 4 _________ oz
10 ml = _______ 2 _________ tsp
5.0 ml = _______ 1 _________ tsp

Practice Application

1. 6 kg
2. 0.6 ml
3. 0.4 ml
4. 1.8 ml
5. 1 tsp
6. 5.7 ml
7. 2.6 ml
8. 1.2 ml
9. 10 ml
10. 14 gtts/min.
11. 100 gtts/min
12. A. 9.6 ml
13. 1-10 mg tab
14. 6.2 ml
15. 0.46 ml
16. B. 1.3 ml
17. A. 4.6 ml
18. 0.6 ml
19. A. 3.6 ml
20. B. 0.5 ml
21. 1-2.5 mg tab
22. 6.2 ml
23. 0.46 ml
CONVERSION CHART

5 mL = 1 tsp

1000 gm = 1 kg

1000 mg = 1 gram (gm) or (Gm)

1000 mcg = 1 mg

30 ml = 1 ounce

2.2 lb. = 1 kg

gtt rate = \frac{\text{ml} / \text{ordered time} \times \text{gtt factor}}{\text{Time in minutes}}