Packet Introduction

Welcome to the Elliot Physician Network/Elliot Professional Services. We look forward to working with you in the future and would like to prepare you in achieving a successful orientation. Please know that, at any point, if you need additional information and/or guidance we are eager to assist. Please contact Kim Burd, RN Clinical Nurse Educator at 663-4938 or via email at kburd@elliot-hs.org. In the event of her absence you may contact Cynthia Gray, RN at 663-3163. Attached you will find your Clinical Math Review Packet. We strongly recommend you review the material and complete the practice calculations prior to completing your math test. The math test will be administered by Kim Burd, RN before you begin your employment with us. You will only be allowed one incorrect answer at which time you will be remediated if necessary. In the event you are unable to successfully pass the test, your employment agreement may be rescinded.
Five Rights of Medication Administration

The first important medication administration information are the “Five Rights’ included below. These are important because they help decrease medication errors. Be sure to memorize these and incorporate them into your medication preparation and delivery processes.

**Right** Person  
(Verify Name and Date of Birth)

**Right** Drug

**Right** Dose

**Right** Route

**Right** Time
**BANNED ABBREVIATIONS at ELLIOT**  
Effective 09/12/06

<table>
<thead>
<tr>
<th>Potentially Unsafe Practice</th>
<th>Preferred Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>A trailing zero was used (1.0)</td>
<td>1</td>
</tr>
<tr>
<td>A leading zero was not used (.5)</td>
<td>0.5</td>
</tr>
<tr>
<td>D, QD</td>
<td>Q day, daily, every day, Q 24 H</td>
</tr>
<tr>
<td>QOD</td>
<td>every other day, Q 48 H</td>
</tr>
<tr>
<td>U, u</td>
<td>units</td>
</tr>
<tr>
<td>IU</td>
<td>units, international units</td>
</tr>
<tr>
<td>TIW, tiw</td>
<td>three times a week</td>
</tr>
<tr>
<td>MSO4, MS</td>
<td>Morphine</td>
</tr>
<tr>
<td>MgSO4, Mag</td>
<td>Magnesium</td>
</tr>
</tbody>
</table>

You cannot include these in any documentation or medication orders

Additional Abbreviations Not Approved at Elliot Per Medical Records Policy Include:

- b.i.d. or BID
- pc or P.C.
- q AM
- q hr
- q.i.d. or QID
- t.i.d. or TID
- ung
ELLiot POLICY TITLE: SOUND-ALIKE / LOOK-ALIKE MEDICATIONS (HIGH-RISK)

POLICY:
The Pharmacy and Therapeutics Committee evaluates possible ways in which drugs may be confused and takes action to decrease the chance a medication error occurs because products possess similar sounding names or are available in similar appearing packages.

PROCEDURE:
Based on medication error reports filed within the hospital as well as those reports reviewed from such organizations as the Safe Medication Practices (ISMP), United States Pharmacopoeia (USP) and Joint Commission Accreditation of Healthcare Organizations (JCAHO) the following drugs have been identified as having the potential to cause errors secondary to their ability to be confused with other medications:

<table>
<thead>
<tr>
<th>SOUND ALIKE / LOOK ALIKE MEDICATIONS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Reteplase (Retavase, r-PA)</td>
<td>Alteplase (Activase, TPA, t-PA)</td>
</tr>
<tr>
<td>Carboplatin (Paraplatin)</td>
<td>Cisplatin (Platinol)</td>
</tr>
<tr>
<td>Concentrated Liquid Morphine Products (Roxanol 20mg/ml)</td>
<td>Conventional Liquid Morphine Products (Morphine Oral Solution 10mg/ml)</td>
</tr>
<tr>
<td>Epinephrine</td>
<td>Ephedrine</td>
</tr>
<tr>
<td>Fentanyl (Sublimaze)</td>
<td>Sufentanil (Sufenta)</td>
</tr>
<tr>
<td>Insulin Products: Lantus Novolin Humulin Novolin 70/30</td>
<td>Insulin Products: Lente Novolog Humalog Novolog 70/30</td>
</tr>
<tr>
<td>Taxol (Paclitaxel)</td>
<td>Taxotere (Docetaxel)</td>
</tr>
<tr>
<td>Vinblastine (Velban)</td>
<td>Vincristine (Oncovin)</td>
</tr>
<tr>
<td>Wellbutrin SR</td>
<td>Wellbutrin XL</td>
</tr>
<tr>
<td>Zantac</td>
<td>Zyrtec</td>
</tr>
<tr>
<td>Zyprexa</td>
<td>Zyrtec</td>
</tr>
</tbody>
</table>
High risk medications are drugs that bear heightened risk of causing significant patient harm when they are used in error.

All high-risk drugs with a higher potential for dispensing error due to look-alike/sound-alike names, will be stored with a secondary caution label (red alert label).

**Common Calculation Equivalents**

- 1 kilogram (kg) = 2.2 pounds (lb)
- 1 gram (g or gm) = 1000mg (milligrams)
- 1 ounce (oz) = 30 ml (milliliter)
- 1 tablespoon (T or tbs) = 15 ml (milliliter)
- 1 teaspoon (tsp) = 5 ml (milliliter)

**Basic Medication Calculation Methods**

There are a few ways to formulate medication calculations when dosing changes are needed. This packet will present two different formulas and the reader should choose one that best suits their understanding.

**Method 1 (Textbook Approach)**

\[
\text{Desired Dose} = \frac{X \text{(Unknown Volume)}}{\text{Volume on Hand}}
\]

Example: DrugX is stocked at 20 mgs/ml and the provider orders 15 mgs. How many mls will you prepare to deliver this dose?

Let’s set up the formula using the information that is known to us.

\[
\frac{15 \text{ mgs (desired dose)}}{20 \text{ mgs (dose on hand)}} = \frac{X \text{ mls}}{1 \text{ ml}}
\]

Now to complete the calculation, the staff person must cross multiply (top left to bottom right) then separate with an equal sign and cross multiply (top right to bottom left)
Example:

**Step #1**

\[
\frac{15 \text{ mgs (desired dose)}}{20 \text{ mgs (dose on hand)}} = \frac{x \text{ mls}}{1 \text{ ml}}
\]

\[
15 = 20x
\]

or

\[
15 = 20x
\]

**Step #2**

Solve for the unknown or \(x\) by separating the 20 from the \(x\) (unknown). To do this, the staff person must divide the 20 against itself and then divide the 15 by 20 as well. *(Hint: if you divide on one side you must divide on the other side with the same number to balance things)*

\[
\frac{15}{20} = \frac{20x}{20} \text{ which makes } \frac{15}{20} = \frac{x}{1} \text{ .75 mls to draw for correct dose}
\]

**Method 2 (Drug Concentration Approach)**

Drug Concentration as Stocked (as fraction) \(=\) Desired Dose

Example: DrugX is stocked at 20 mgs/ml and the provider orders 15 mgs. How many mls will you prepare to deliver this dose?

Let’s set up the formula using the information that is known to us.

\[
\frac{20 \text{ mgs}}{1 \text{ ml}} = \frac{15 \text{ mgs}}{x \text{ mls}}
\]
Now to complete the calculation, the staff person must cross multiply (top left to bottom right) then separate with an equal sign and cross multiply (top right to bottom left)

Example:

**Step #1**

\[
\begin{align*}
20 \text{ mgs} &= 15 \text{ mgs} \\
1 \text{ ml} &\times \text{ mls}
\end{align*}
\]

or \[20x = 15\]

**Step #2**

Solve for the unknown or X by separating the 20 from the x (unknown). To do this, the staff person must divide the 20 against itself and then divide the 15 by 20 as well. *(Hint: if you divide on one side you must divide on the other side with the same number to balance things)*

\[
\frac{20x}{20} = \frac{15}{20} = \frac{15}{20} \times 0.75 \text{ mls to draw for correct dose}
\]

*Hint: To calculate medications that need reconstitution, just use the final concentration and the desired dose in your calculations-ignore the diluent amount needed to mix the drug to calculate the dose*
Practice Examples (all drug names are fake here)

1. Rubycon is stocked as 50 mgs/1 ml. The provider orders 25 mgs. How many mls will you draw up for this dose?

2. Lexar is stocked as 40 mgs/1 ml. The provider orders 15 mgs. How many mls will you draw up for this dose?

3. Millaki is stocked as 20 mgs/1 ml. The provider orders 12 mgs. How many mls will you draw up for this dose?

4. Burtoni is stocked as 50 mgs/5 mls. The provider orders 35 mgs. How many mls will you draw up for this dose?

5. No name is stocked as 40 mgs/3 mls. The provider orders 30 mgs. How many mls will you draw up for this dose?

6. Tussar is stocked as 20 mgs/1 ml. The provider orders 12 mgs. How many mls will you draw up for this dose?
Practice Example Answer Key

1. Rubycon is stocked as 50 mgs/1 ml. The provider orders 25 mgs. How many mls will you draw up for this dose?
   0.5 mls

2. Lexar is stocked as 40 mgs/1 ml. The provider orders 15 mgs. How many mls will you draw up for this dose?
   0.375 mls

3. Millaki is stocked as 20 mgs/1 ml. The provider orders 12 mgs. How many mls will you draw up for this dose?
   0.6 mls

4. Burtoni is stocked as 50 mgs/5 mls. The provider orders 35 mgs. How many mls will you draw up for this dose?
   3.5 mls

5. No name is stocked as 40 mgs/3 mls. The provider orders 30 mgs. How many mls will you draw up for this dose?
   2.25 mls

6. Tussar is stocked as 20 mgs/1 ml. The provider orders 12 mgs. How many mls will you draw up for this dose?
   0.6 mls

Hint: To calculate medications that need reconstitution, just use the final concentration and the desired dose in your calculations—ignore the diluent amount needed to mix the drug to calculate the dose.

Sources:

http://search.live.com/previewx.aspx?q=Medication+Errors+and+Nursing&FORM=CBPW&first=1&noredir=1

http://search.live.com/previewx.aspx?q=math+and+nurses&FORM=CBPW&first=1&noredir=1

http://www.accd.edu/sac/nursing/math/mathindex2.html

http://ike/pharmacy_new/

http://online.statref.com/Document/Document.aspx?DocId=1&FxId=38&Scroll=7&Index=0&SessionId=ABCBD6LREVPNPSHV

12/2012