



College of Licensed Practical Nurses of Nova Scotia

Administration of Medications: A Self-Assessment Guide for Licensed Practical Nurses



CLPNNS EMPLOYER GUIDELINES

Our Vision

A dynamically regulated profession committed to excellence

Our Mission

In the interests of the public, CLPNNS regulates the practice of Licensed Practical Nurses in the province.

About the College

The College of Licensed Practical Nurses of Nova Scotia (CLPNNS) is the regulatory body for the province's 3,500+ Licensed Practical Nurses. Members of the College play a significant and vital role in Nova Scotia's health care system. LPNs provide professional health care services in a variety of settings and contexts of practice including, but not limited to acute care, long term care, community, continuing care, clinical, mental health, obstetrics and paediatrics. CLPNNS regulates the profession in the best interests of the public by setting entry level practice requirements and establishing, monitoring and enforcing standards of practice and standards of professional conduct. CLPNNS also ensures the enhancement of care provided by members through the Continuing Competency Program. CLPNNS supports members in meeting their professional responsibilities through our quarterly newsletter, the College Reporter, hosting of the AGM, our website www.clpnns.ca and numerous practice consultations via phone, email and in person/on-site.

2010, College of Licensed Practical Nurses of Nova Scotia
Suite 302, Starlight Gallery
7071 Bayers Road
Halifax, NS B3L 2C2

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Administration of Medications A Self-Assessment Guide for Licensed Practical Nurses

The purpose of this document is to provide you with an overview of medication administration information to assist you to perform a self-assessment of your medication administration competence (knowledge, skill and judgment).

Medication Administration is a basic entry level competency for the Licensed Practical Nurse (LPN). Safe medication administration requires knowledge of pharmacology, patient assessment, standards and institution policies, skills in various forms of administration and judgment around safe medication practices. The practice of medication administration requires the LPN to assess the appropriateness of the medication for the client, prepare and administer the medication correctly, assess the effectiveness of the medication, anticipate, identify and manage adverse reactions in partnership with the Registered Nurse and/or physician, document the process according to institution policy and teach the client about the medication as it relates to overall health. (CRNNS, 2011) It also requires ongoing self assessment of competency and participation in continuing education activities.

How to Use this Guide

Review each of the sections. There are three self-assessment tools corresponding to the content. Complete the questions and compare your answers to the answer keys. Reflect on your responses. Reflection involves the exploration of experiences in order to create a new understanding or appreciation of knowledge (Mann, Gordon and MacLeod, 2007). Examine your responses and think about how you arrived to each one. Think about them in terms of how easy or difficult it was to get to your answer. Think about your past practices in medication administration and your current and/or future practice environment and how that impacted your responses. Ask yourself the following questions as you reflect on your answers.

- **What parts of tools were easy? Difficult? Why?**
- **Do I have the necessary knowledge, skill and judgment to perform these skills?**
(Remember: Medication administration is about understanding and applying principles of safe medication administration, which includes knowing when and how to use a reference. There is no expectation that any one nurse know every detail about every medication on the market today).
What are my strengths? What or where are gaps in my knowledge.

Use the reflective self-assessments as part of meeting the overall requirements of the Continuing Competency Program (CCP). The findings of the self-assessment can be used to build a reflective learning plan as part of CCP.

SECTION 1: General Medication Administration Guidelines

1. Prescriber orders must be appropriate, legible, current and complete. Orders are to be transcribed or processed accurately. Transcription procedures vary according to organization. Refer to the policy as necessary.
2. Medications must be appropriate for the client and make sense to the client's context. Assess the appropriateness of the medication for the client. Understand the purpose, dose range, side effects, possible risks, contraindications, appropriate administration times, interactions with other medications of all medications to be administered. Consult appropriate and organizationally approved resources (Micromedex, eCPS) or references as necessary.
3. Medications must be prepared appropriately and safely
 - a. Ensure the **environment is suitable** for medication administration
 - i. Adequate lighting
 - ii. Minimal interruptions
 - iii. Supports the use of aseptic technique
 - iv. Uncluttered
 - b. Check the **medication label three times**
 - i. When the medication is removed from storage
 - ii. Immediately prior to removing from the container/packaging
 - iii. When returning to the storage area
 - c. Make sure dosage **calculations are accurate**
 - i. Engage co-workers in an independent double check of math calculations when necessary
 - ii. Crush or split only if appropriate
 - iii. Do not administer a medication from an unlabeled or illegible container
 - iv. Do not administer a medication prepared by someone else, unless there are exceptional circumstances (code) or mass rapid vaccination clinics (H1N1). This practice is less common and requires an organizational policy to be in place to support it.
 - This does not apply to medications prepared by a pharmacy employee
 - d. Make sure of appropriate medication **storage and disposal**
 - i. Medication is stored appropriately (refrigerated if necessary)
 - ii. Unused portions are disposed of according to organizational policies

4. Pre-pouring medications for later use is unacceptable. However in some practice contexts, i.e. home care, the nurse may 'set-up' daily/weekly medications for a client. This practice is context specific requires an organizational policy/practice guideline to be in place to support it.
 - i. Do not leave a medication at a client's bedside to be taken later.
5. Clients must be identified using the Medication Administration Record (MAR) and the armband with two client identifiers (i.e., the Medical Record Number (MRN), date of birth, name). **If the institution does not require clients to wear armbands, follow the policy for client identification.**
6. Document **immediately after** medications have been given and never before. Assess and document the client's response to the medication. See practice in action: page 6.

REFLECTIVE PRACTICE

Ask yourself the following questions:

1. Do I understand the content?
2. What, if any, other activities will support my learning?
3. If other activities or resources are necessary, what is my plan to access them and increase my knowledge?
4. How will having this knowledge improve my daily practice?

SECTION 2: A Medication Administration Safety Framework: “The Rights”

The LPN is accountable to ensure client safety in the medications administration process. The “Rights” of medication administration is a safety framework that nurses utilize to maximize accuracy and safety in medication administration.

The Right Drug:

Many medications have similar names, packaging, spellings, and variable concentrations. It is vital to ensure that the spelling is correct and the concentration of the medication on hand, is the same as the one that was prescribed. Verify this against the Medication Administration Record (MAR). review the label of the medication at least three times before it is administered.

The Right Time:

Institution policy generally sets standard medication administration times. Sometimes, standard times do not match the administration schedule the client has been following at home. Where possible, the nurse should work with the client to follow as close to the standard administration times as possible to prevent confusion and potential medication errors.

Knowledge of pharmacology is important in scheduling times. For example: Is the drug best given with food or on an empty stomach? How important is regular schedules to maintain therapeutic blood levels? Is it required for a diagnostic procedure? What time was the last dose given?

The Right Dose:

Most medications have a dose range (which is set by the manufacturer). The dosage of a specific medication may vary in relation to the medical needs of the client, age and disease process. Make sure the dose is appropriate for the client’s age and medical condition. Dosage calculations need to be accurate and engage co-workers in an independent second or third check of calculations if necessary. Ensure the medication is in the right form, the correct measuring device is used and ensure only appropriate medications are crushed/split. Remember to consult pharmacy if alternate dosage forms are required.

PRACTICE IN ACTION: Independent Double Check

*A double-check of calculations by another care provider who **does not** have knowledge of prior calculations.*

Mary performs drug calculations to determine a required dose of antibiotic medication. She asks Robert to perform the same calculation. They compare answers for accuracy.

The Right Client:

Best practices in client safety include checking 2 client identifiers prior to the provision of any service or procedure, including medication administration. Compare the MAR/Client Medication Profile with the armband* and check the client's full legal name along with one of the following:

- medical record number
- health card number
- date of birth

Do not solely rely on clients to correctly identify themselves, as levels of mental alertness may vary.

** If the institution does not require clients to wear armbands, follow the policy for client identification*

The Right Route:

The medication order must specify the route by which the medication is to be administered. Never substitute one route for another unless that option is written explicitly into the order. For instance, ***Dimenhydrinate 25 mg PO or IM q4h PRN***. Indicate on the MAR which route was chosen.

The Right Education:

The client has the right to be educated about the medication(s) in which she/he is prescribed. Nurses are accountable to make sure clients and/or family members have the right education and all questions are answered. The type and nature of education (include the client's response to the teaching) is documented in the client's record or according to organization policy.

The Right to Refuse:

The client has the right to refuse a medication. The nurse is responsible to determine the reason for the refusal and to communicate this to the prescriber. Document (the refusal and communication to the prescriber) in the client's record.

Often, a client may decide to take a medication when additional teaching is provided. However, the client may continue to refuse a medication despite additional teaching. If this is the case, the nurse is responsible to collaborate with the prescriber and the client to determine if the medication is to be continued, discontinued or changed.

The Right Evaluation:

A client assessment is required before and after a medication is administered. The type and nature of the assessment is dictated by the client needs and the kind of medication(s) being administered. For example, a pain assessment includes a review of the intensity, location, duration, and quality of the pain. A respiratory assessment includes a review of lung sounds, respiratory rate, skin and mucous membrane colour, effort of breathing and the presence of any productive/non-productive cough. Pre and post medications assessments are important. They provide critical pieces of data that guide nursing decisions. Document the findings of a pre and post medication assessment in the client record.

The LPN is responsible to engage the appropriate care provider (RN or MD) as soon as possible;

1. When the appropriate results are not achieved;
2. The client has an unexpected response to a medication.

The Right Documentation:

Timely documentation prevents medication errors. Best practice is to document immediately after the administration of a medication, not before. Document your (pre/post) assessment of the client, the nature or type of health teaching, any unexpected outcomes (such as the client refuses the medications) and any consultations that occurred as a result of the client's outcomes.

PRACTICE IN ACTION

Documenting medication before it is administered is a high risk practice. It can create confusion between care providers and lead to unwanted/unexpected client outcomes.

Nurse Lisa "signs-off" each one of Mr. Smith's 0900 medications as she removes them from the package and places them in the medication cup. As she gets ready to enter Mr. Smith's room, Mrs. MacDonald rushes into the hallway and frantically tells Lisa, "My husband is not breathing very well". Upon entering the room, Lisa finds Mr. MacDonald cyanotic and non-responsive and is unable to palpate a radial pulse. She sets the medication cup on the over-bed tray, pulls the emergency cord and initiates CPR.

Robert, an LPN colleague, assumes the care of Lisa's clients during the crisis situation. He begins by reviewing the MAR records and notes that Mr. Smith's medications are "signed-off". Interpreting this to mean that the medications have been administered, he moves on the group of clients in the next room. Mr. Smith does not receive any 0900 medications.

REFLECTIVE PRACTICE

Ask yourself the following questions:

1. Do I understand the content?
2. What, if any, other activities will support my learning?
3. If other activities or resources are necessary, what is my plan to access them and increase my knowledge?
4. How will having this knowledge improve my daily practice?

SECTION 3: Pharmacology and Medication Administration References and Nursing Assessment

The nurse is accountable to be familiar with the medication she/he is administering. Access to a reliable medication reference is vital to safe medication administration. The nature and type of nursing assessment is specific to the context terms of pharmacology and medication administration.

Indications: The reason the medication is prescribed.

Nursing Assessment: Does this make sense for the client's condition?

Contraindications: Reasons a medication should NOT be prescribed to a client. For instance, some medications should be avoided by clients with reduced renal function.

Nursing Assessment: Does the client have any co-morbidities or other conditions that may impact the prescribed medication?

Recommended Dose: The dosage of medication, or range, recommended by the manufacturer.

Nursing Assessment: Does the prescribed dose fall in the recommended range? Does the client have any co-morbidities that would necessitate a reduction in a dose?

Interactions: The action of the medication is affected by another medication or food.

Nursing Assessment: Is the client taking other medications that may impact the prescribed medication? Should this medication be taken with or without food?

Onset: The time when the medication first starts to have an effect. This is important to know to measure effectiveness or an onset of an adverse reaction.

Nursing Assessment: Will this be impacted by the client's ADLs or the treatment plan?

Duration: The amount of time the medication has an effect. This is important to understand duration and its impact on a dosing schedule.

Nursing Assessment: Will this be impacted by the client's ADLs or the treatment plan?

Peak Time: The time when the medication will have the peak effect for the client. This may be the time that side effects may be observed, or that the client will have the most relief from symptoms. It is important to know peak time so you can assess for effects at that time.

Nursing Assessment: Will this be impacted by the client's ADLs or the treatment plan?

Half Life: The time interval required to reduce the amount of drug in the body by 50%. It is important to know this to schedule dosing intervals as well as to know when the drug will be eliminated from the client's body if there are adverse effects.

Nursing Assessment: Does the client have any co-morbidities that will impact (make the half-life longer or shorter) the excretion of the medication?

Side Effects: Know what common side effects the medication has so the client can be assessed for them, or so they can be anticipated and managed with appropriate treatment.

Nursing Assessment: Does the client have a condition where a side effect may be masked? Or delayed? Or appear to be related to another cause?

Excretion: Understand how the medication is eliminated from the body (usually by the liver or the kidneys) and if the client has any condition which may alter the elimination from the body.

Nursing Assessment: Does the client have any co-morbidities that will impact (make the half-life longer or shorter) the excretion of the medication?

REFLECTIVE PRACTICE

Ask yourself the following questions:

1. Do I understand the content?
2. What, if any, other activities will support my learning?
3. If other activities or resources are necessary, what is my plan to access them and increase my knowledge?
4. How will having this knowledge improve my daily practice?

SECTION 4: Pharmacology Self- Assessment

Review the case study and answer the questions. Compare your answers to the answer key. Reflect on the ease and completeness of your answers. **The greater the difficulty and/or incompleteness of your answer, the more it is likely that you should engage in additional employer or community college based pharmacology education.** Individual nurses are accountable to work with their employers to make certain that have access to the necessary work-place education and support before engaging in a skill.

As you self-assess your knowledge, skill and judgement (competency), remember that there is no expectation to you memorize every detail about every medication on the market today. There is however, an expectation, that you are competent to apply the general medication administration principles within a framework (The Rights of Medication Administration) using appropriate references and reference materials as necessary.

Case Scenario

Mr. Wells is a client at the facility in which you work. He has multiple chronic health problems that require numerous medications to keep his condition stable. His known health problems include: Type II diabetes mellitus, heart failure and chronic obstructive pulmonary disease.

Medications include the following:

- digoxin 0.125mg po daily
- nitroglycerine patch 0.4mg/hr for 12 hours/day
- albuterol MDI, 2 puffs tid
- fluticasone MDI, 2 puffs bid
- glyburide 10mg po bid
- prednisone 40mg po daily
- alendronate 70mg po weekly
- calcium carbonate 500mg po bid
- vitamin d 1000iu po daily
- asa 81mg po daily
- acetaminophen 325mg with codeine 30mg ii tabs @ hs & q6h prn
- Bowel protocol as follows:

Level I

- docusate 100 mg po bid with meals
- fruitlax 30mL bid (with meals) except for diabetic and renal pats
- If no BM within 24 hrs; move to Level II

Level II

- docusate 100mg po bid with meals
- sennosides 12mg 1-2 tabs or cascara 5-10mL at hs
- If no BM for further 24-48 hrs; move to Level III

Level III

- docusate 200mg po bid (with meals)
- sennosides 12mg 2-3 tabs or Cascara 10-20mL at hs
- bisacodyl 10mg supp and glycerin (adult) supp in am
- If supp ineffective, give Sodium Phosphate (Fleet) enema and
- If still ineffective – administer Oil retention enema
- If no BM contact MD.

PART 1

Answer the following questions about Mr. Wells' medication list.

1. Why is Mr. Wells prescribed digoxin 0.125mg po daily?
2. What are the nursing responsibilities related to digoxin administration?
3. Digoxin is stocked in 0.25 mg tablets. How many tablets are to be administered to Mr. Wells?
4. What is a nitroglycerine patch?
 - a. Why Mr. Wells prescribed this?
 - b. Why is a nitroglycerine patch removed after 12 hours?
5. What nursing actions support optimal results from a nitroglycerine patch?
6. Mr. Wells has an order for albuterol MDI, 2 puffs tid and fluticasone MDI, 2 puffs bid. What is a MDI?
7. Why are these two inhalers prescribed?
8. Occasionally, the inhalers are to be administered at the same time. What nursing actions support optimal results from both inhalers?
9. Why is Mr. Wells prescribed prednisone 40mg po daily ?
10. Identify common side effects of prednisone.

PART 2

ADDITIONAL SCENARIO INFORMATION

Mr. Wells' physician has ordered a diagnostic test, which requires him to fast

Answer the following questions about Mr. Wells' medication list.

1. What is/are the appropriate medication specific nursing action(s) during the fasting period?
2. What are the risks to stopping prednisone abruptly?

3. Why is Mr. Wells prescribed alendronate 70mg po weekly ?
4. Why does Mr. Wells require a bowel protocol?
5. His last bowel movement was 36 hours ago. Identify the medications and the time they are to be administered to Mr. Wells.
6. What is the brand name for acetaminophen 325mg with codeine 30mg?
7. Mr. Wells receives glyburide 10mg po bid . How does this medication work?
8. Glyburide is available in 5mg tablets.
 - a. How many tablets are required each dose?
 - b. In a 24 hour period?
9. Is Mr. Wells more likely to experience hypoglycemia or hyperglycemia while fasting?

PART 3

ADDITIONAL SCENARIO INFORMATION

Mr. Wells' blood glucose level is progressively rising.
His physician orders insulin 70/30, 10 units subcut qam.

Answer the following questions about Mr. Wells' medication list.

1. What factors are responsible for the elevation in his blood glucose levels?
2. What does 70/30 mean?
 - a. What are the onset, peak, and duration times for the insulin?
 - b. What nursing interventions reduce the risk of hypoglycemia of the client receiving both oral hypoglycemic medication and insulin?
3. What nursing interventions, are instituted if Mr. Wells is conscious and his blood glucose level is 3.2 mmol/L?

PART 4 ADDITIONAL SCENARIO INFORMATION

Mr. Wells has increasing edema in his lower limbs. The physician orders furosemide 20mg po daily.
He has been receiving the medication for two weeks and there is little improvement.
The order is changed to furosemide 40mg po daily.

1. What assessment findings would indicate a therapeutic effect of the furosemide?
2. Mr. Wells complains of weakness, nausea and visual disturbances. What drug-drug processes may be responsible for this?
3. **Assessment finding:** A white plaque coating (which was not removed with brushing) on tongue and mouth.
 - a. What is this?
 - b. What may have caused it?
 - c. What nursing actions may prevent/reduce it?
4. Mr. Wells receives ASA 81 mg od. What is the rationale for this order?

REFLECTIVE PRACTICE

Ask yourself the following questions:

1. Do I understand the content?
2. What, if any, other activities will support my learning?
3. If other activities or resources are necessary, what is my plan to access them and increase my knowledge?
4. How will having this knowledge improve my daily practice?

SECTION 5: Dosage Calculation Self-Assessment

Accurate drug and dosage calculation is vital to safe medication administration. Complete the following exercises. Compare your answers to the answer key. Reflect on the ease and completeness of your answers.

The greater the difficulty and/or the incompleteness of your answer, the more it is likely that you should engage in additional employer or community college based pharmacology education. Individual nurses are accountable to work with their employers to make certain that have access to the necessary work-place education and support before engaging in a skill.

Refresher:

H = dose on Hand

V = Vehicle – tablet or liquid

D = Desired dose

X = unknown

$$\frac{H}{V} = \frac{D}{X}$$

V X Cross multiply to solve for X

$$HX = DV$$

$$X = \frac{DV}{H}$$

Example:

A client is ordered 15mg of prochlorperazine. You have on hand 25mg of prochlorperazine in 2mL solution. What volume of solution would you give?

$$\frac{25\text{mg}}{2\text{ml}} = \frac{15\text{mg}}{X}$$

$$25\text{mg}X = 15\text{mg} \times 2\text{mL}$$

$$X = \frac{15\text{mg} \times 2\text{mL}}{25\text{mg}}$$

$$X = \frac{30}{25} = 1.2\text{mL}$$

IV Rate Calculation:

Drops per Minute (gtt/min)

$$\frac{\text{Total volume (mL) to infuse} \times \text{Drop factor (on IV Tube packaging)}}{\text{Time (in minutes)}} = \text{drops/minute}$$

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Example: 125mL D5W/hr, drop factor 15 gtt/mL $\frac{125\text{mL} \times 15 \text{ gtt/mL}}{60 \text{ min}} = 31.25$ (32)

Problems:

1. Order: furosemide 80mg PO. Drug available is furosemide 10mg /mL suspension. How many mL / dose of furosemide will you administer?
2. Order: clozapine 250mg PO. Clozapine 100mg is available in tablet form. How many tablets / dose of clozapine will be administered?
3. The physician ordered meperidine 50mg IM q4h and dimenhydrinate 25mg IM q4h. Meperidine comes in 50mg / mL ampoules and the dimenhydrinate comes in 50mg / ml ampoules. Calculate the total volume of mL for the IM injection.
4. 640mg of liquid acetaminophen has been ordered by the Doctor. It is available in 160mg/5mL of solution. Calculate the number of mL required / dose.
5. The physician ordered amoxicillin 500mg PO q8h PRN. Amoxicillin is available in liquid as 125mg/ 5mL. Calculate the volume of the dose.
6. Solve the following problems
 - a) Order: 250mg po
Label: 500mg tablet
How many tablets?
 - b) Order: 0.125mg PO
Label: 0.25mg
How many tabs?
 - c) Order: 6mg IM
Label: 10mg/mL
How many mL?
 - d) Order: Heparin 2,500 units
Label: Heparin 10,000 units/mL
How many mL?
 - e) Order: KCl 40 mEq
Label: KCl 10 mEq/5mL
How many mL?
7. A client is ordered 35mg of codeine phosphate by subcutaneous injection. 50mg in 1mL of liquid for subcut injection is available. How many mL will you administer?
8. A client is ordered 20mg of haloperidol by intramuscular injection. 50mg in 1mL of liquid for IM is available. How many mL will you administer?

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9. A client is ordered 75mg of pethidine HCL by subcut injection. 50mg in 1mL of liquid for subcut injection is available. How many mL will you administer?
10. A client is ordered 5mg of flupenthixol decanoate by IM injection. 40mg in 2mL of liquid for IM injection is available. How many mL will you administer?
11. A client is ordered 5mg of haloperidol orally. 2mg in 1mL of syrup is available. How many mL will you administer?
12. A client is ordered 13mg of morphine sulphate by IM injection. 5mg in 1mL of liquid for IM injection is available. How many mL will you administer?
13. A client is ordered 22mg of gentamicin sulphate by IM injection. 20mg in 2mL of liquid for IM injection is available. How many mL will you administer?
14. A client is ordered 50mg of sodium valproate orally. 200mg in 5mL of syrup is available. How many mL will you administer?
15. Haloperidol 4mg IM is ordered. Haloperidol is available as 5mg in 1mL of liquid for IM injection. How many mL will you administer?
16. The client is prescribed 1200mL of D5W solution to be administered over a 10 hour period. The sol'n is to be infused via pump. At what hourly rate should the pump be set to deliver the prescribed amount?
17. An IV solution of 1000mL of D5W NaCl is to infuse over 8 hours. The IV set drop factor is 15 gtts/mL. How many drops per minute should the client receive?
18. A client is to receive 300mL of NaCl solution over a period of 90 minutes. At what hourly rate should the infusion pump be set for?
19. The client is to receive 0.5L of D5W NS with 20mEq of potassium chloride over 10 hours. At what rate should he receive the IV fluid?

20.

2000mg = _____ g

50g = _____ mg

2L = _____ mL

230mcg = _____ mg

250mg = _____ g

2.5Kg = _____ g

0.5L = _____ mL

20mg = _____ g

0.7mg = _____ mcg

240mL = _____ ounces

21. A client is ordered 2.5mg of promethazine hydrochloride orally. 5mg in 5mL of elixir is available. How many mL will you administer?
22. A client is ordered 4mg of trifluoperazine orally. 5mg in 5mL liquid is available. How many mL will you administer?
23. A client is ordered 60mg of nefopam hydrochloride by IM injection. 20mg in 1mL of liquid for IM injection is available. How many mL will you administer?
24. A vial contains 250mg of tetracycline in a total of 2mL of solution. How many milligrams of tetracycline are contained in 0.6mL of solution?
25. A client is to receive 100mg dose of gentamicin. On hand is a vial containing 80mg/mL. How many mL should be administered?

REFLECTIVE PRACTICE

Ask yourself the following questions:

1. Do I understand the content?
2. What, if any, other activities will support my learning?
3. If other activities or resources are necessary, what is my plan to access them and increase my knowledge?
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SECTION 6: Transcription of Orders Self-Assessment

All prescriber orders must be written clearly and complete. If the order is unclear or just “doesn’t seem right”, it is to be clarified with the writer of the order. Complete orders include:

1. Client name (and/or other required organizational identifiers);
2. Name of the medication;
3. Dose;
4. Frequency of administration;
5. Route of administration;
6. May include additional instructions or assessment parameters;
7. Does not contain any error prone or high risk abbreviations:
***See attached ISMP Error Prone Abbreviation list or
<http://www.ismp.org/Tools/errorproneabbreviations.pdf>***

All orders must also be accompanied with:

1. The date and time the order was written or taken
2. A clearly visible notation about client allergies
3. A legible signature of the prescriber. In the situation of telephone orders the physician may expected to co-sign telephone orders (refer to agency policy).
4. Telephone orders include the receiving nurse’s legible signature and professional designation.

Taking and transcribing physician’s orders is an important element of safe medication administration. Complete the following exercises. Compare your answers to the answer key. Reflect on the ease and completeness of your answers. **The greater the difficulty and/or the incompleteness of your answer, the more it is likely that you should engage in additional employer based pharmacology education.** Individual nurses are accountable to work with their employers to make certain that have access to the necessary work-place education and support before engaging in a skill. Responses may vary slightly in relation to variation in agency policies and protocols

Identify deficits in the following orders. There may be more than one deficit per order.

1. Furosemide 20 mg po od odd days.
2. Tobramycin 2 gtts tid a.s. for left eye drainage.
3. Digoxin .25 mg od.
4. Nitro-Dur 0.4 mg/hr od.
5. Nitro Spray 0.4 mg for angina prn

6. Iron supps daily
7. Ativan 2.0 mg po for anxiety
8. Prednisone 1/2 tab daily
9. AZT 100 mg po od

REFLECTIVE PRACTICE

Ask yourself the following questions:

1. Do I understand the content?
2. What, if any, other activities will support my learning?
3. If other activities or resources are necessary, what is my plan to access them and increase my knowledge?
4. How will having this knowledge improve my daily practice?

SECTION 7: Frequently Asked Questions

I successfully completed a post grad pharmacology course 3 years ago. Since then, I have had limited experience in administering medications. I have changed employers and my new employer requires me to administer medication. Do I have to re-take the course?

All nurses must have the necessary knowledge, skill and judgment (competency) to safely and effectively administer medications. To answer this question you must engage in a reflection of your current competency and perform a self-assessment of your skills. If you self-assess that you possess the necessary knowledge and judgment, but lack the skill (because of inexperience), you should work with your employer to ensure that you have a sufficient orientation to the process of medication administration in your workplace. If you feel that your knowledge deficit is more significant, you should work closely with your employer to make sure you get the necessary education and information to be able to competently administer medications.

Can I administer medications to unpredictable clients?

LPNs provide care for unpredictable clients in collaboration with another care provider, which is generally an RN*. Collaboration is the process of two or more care providers discussing the needs of the client and determining both the best action and the nurse best positioned to provide it. Even when a medication is familiar to the LPN, the LPN must engage the in a discussion about the needs of the *unpredictable* client. The rationale for this is that a familiar medication may have an unexpected impact on an unpredictable client or a client experiencing changes in health status. For example: Mary is an LPN caring for Robin, a 73 year old, who is 4 days post-operative from a total hip replacement. Shortly after lunch, Robin becomes short of breath, cyanotic and complains of chest “heaviness”. Mary, recognizing these changes, consults Heather to also assess Robin. They decide together that Heather will coordinate the overall care for Robin, which involves preparing her transfer to the ICU. Mary will continue to provide the necessary supportive care for Robin until she leaves the unit.

Robin has been assessed by the ICU physician and orders have been written. The new orders include Morphine Sulphate 2-4 mg sc q4h PRN to manage her pain. Robin tells Mary that she has pain and ranks her pain score at 8/10 and requests pain medication. Mary is competent to administer Morphine Sulphate, but she knows that Robin’s condition is changing. Mary knows she can no longer reasonably predict how Robin will respond to the medication, so she consults Heather prior to administering the Morphine. Mary and Heather discuss the medication and decide on a dose within the prescribed range. Mary administers the medication and consults with Heather when Robin’s pain has been relieved.

**Or other care provider with the capacity to provide consultation.*

I was excited to begin administering medications on my unit, however my unit orientation was disappointing. I have been an LPN for 23 years, and medication administration is new to me. My manager was surprised when I asked for 2 additional orientation shifts (for a grand total of 5). I'm frustrated because I know I can do this work but I'm struggling to build a practice routine with only 5 shifts to re-learn what I been doing the same way for 23 years. I am worried I may make a mistake.

It is not atypical for an experienced nurse to feel like a novice whenever there is a substantial change in practice such as moving to a new unit or the addition of new skills. If you feel ill-prepared to engage in the practice of administering medications on your unit after your orientation you, are responsible to discuss this with your manager and negotiate additional orientation or learning time. If your employer is unwilling to comply with your request, document your concerns in a letter stating why you feel you need additional employer support to integrate these new skills in to your practice. You should also continue to access or engage in the unit based practice supports as you make your transition.

I know I can take/transcribe a verbal order (without a co-signature) for any medication in which I have the competency to administer, but can I take/transcribe a telephone order for a medication I cannot administer?

LPNs may take telephone orders for medications they cannot administer *if* they are competent to administer the medication in a different form. This includes most routine medications, antibiotics, or pain medications. The rationale is that the LPN has the necessary underlying knowledge to accurately record or question the medication order as necessary.

This said, in everyday circumstances, LPNs *should not take* telephone orders for intravenous chemotherapy or PCA/Epidural pain medication. The rationale for this is related to the broader complexity of the management of these medications in the IV/Epidural form.

LPNs may *preliminarily* transcribe orders for medication they cannot administer however; the transcription must be co-signed and *verified* by a care provider competent to administer the medications. The rational is that though the LPN has sufficient general knowledge of the medication to take the telephone order, they may not possess the specific knowledge to *independently determine* the appropriateness of the order.

ANSWER KEYS

CASE SCENARIO

PART 1

1. Mr. Wells has heart failure, a condition in which the heart action and rhythm have been affected (due to previous injury or prolonged cardiac stress), resulting in ineffective heart contractions and possible abnormal heart rhythms. Digoxin has two primary actions; it increased the force of contraction as well as slowing the heart rate, allowing the heart to fill and empty more completely.
2. Determine apical heart rate for one full minute for withholding the medication if the rate is less than 60 beats per minute or the rate as defined by organizational policy/practice. The physician should be notified if Mr. Wells exhibits alterations in his rate, rhythm, and quality of pulse. (In the long term care setting a radial pulse may be acceptable) (Clayton et al 2010)
3. 0.5 tabs
4. A trans-dermal patch applied to the client's skin and the medication is time released for absorption while in contact with the client's skin.
 - a. Nitroglycerine will dilate the coronary arteries allowing more oxygen to be delivered by the blood to the myocardial cells.
 - b. Removing Nitro-Dur after 12 hours reduces the development of tolerance to the medication that would ultimately require higher doses.
5.
 1. Apply to any hairless (non-distal) site and ensure contact with skin by pressing firmly
 2. Rotate sites to avoid skin irritation
 3. Replace if the patch becomes loose/curled up
 4. Remove as directed
6. MDI is a metered dose inhaler and refers to the method of delivery. MDI releases a set amount of medication with each compression of the inhaler canister.
7. Mr. Wells has chronic obstructive pulmonary disease, causing bronchoconstriction which results in decreased exchange of gases at the alveolar level. It is also associated with an inflammatory response that further decreases the diameter of the bronchi compounding the respiratory problems. Albuterol is a bronchodilator that relaxes smooth muscle of the bronchi thereby enhancing the flow of air in and out of the lungs. Fluticasone is a topical corticosteroid whose anti-inflammatory properties reduce swelling and mucus production further increasing bronchial diameter and promoting ease of alveolar gas exchange. Inhaled forms of the medication act locally, resulting in fewer side effects than systemically absorbed forms.
8. Albuterol is administered first to relax smooth muscle of the bronchi and open the airways to permit optimal distribution and absorption of fluticasone.

9. Prednisone is a systemic corticosteroid that reduces the inflammatory process in the bronchi easing Mr. Wells' respiratory effort.
10. Cushingoid syndrome – moon face, fat redistribution, buffalo hump, etc, osteoporosis, hypertension, hypokalemia, hyperglycemia, gastric ulcer, edema, immunosuppression, edema, parchment paper like skin, cataracts.

PART 2

ADDITIONAL SCENARIO INFORMATION

Mr. Wells' physician has ordered a diagnostic test, which requires him to fast

1. Contact the physician to receive direction as to whether the medications can be administered with a small quantity of water, deferred, or whether a parenteral form might be necessary.
2. Prednisone causes suppression of the body's normal secretion of corticosteroids and the client is at risk for Addisonian crisis (shock) with sudden withdrawal of the corticosteroids.
3. Prednisone may cause bone loss predisposing the client to an increased risk of fracture caused by secondary osteoporosis. Alendronate will aid in the prevention of bone loss and reduce Mr. Wells' risk of fracture.
4. Several factors predispose Mr. Wells to constipation. These may include decreased bowel motility due to various health problems such as diabetes, potential insufficient fluid intake, decreased activity resulting in reduced peristaltic activity and side effects of medications, in particular acetaminophen with codeine.
5. Level II protocol is to be followed. Administer docusate 100 mg at 0800 and 1700. At 2200 administer sennosides 12mg 2 tablets. Cascara 5-10mL can be given instead of sennosides if Mr. Wells prefers.
6. Tylenol #3
7. It lowers blood glucose by:
 1. stimulating pancreatic release of insulin
 2. increasing the sensitivity to insulin at receptor sites
 3. reduction of hepatic glucose formation
8. a. 10 mg = 2 tablets per dose
b. 20 mg per day / 5 mg tablets = 4 tablets per day.
9. Hyperglycemia

PART 3

ADDITIONAL SCENARIO INFORMATION

Mr. Wells' blood glucose level is progressively rising. His physician orders Humulin 70/30 insulin, 10 units subcut qam.

1. Noncompliance to prescribed diet
Side effects of medications such as prednisone
Decreased exercise
Presence of stress and/or an infection
2. Humulin insulin is a genetically engineered (biosynthetic) hormone replacement for insulin normally secreted by the beta cells of the pancreas. The Humulin insulin 70/30 is a premixed combination of 70% intermediate insulin and 30% short acting insulin.
 - a. The onset, peak and duration for each of the two types differ and vary with individuals and manufacturer. Approximate onset, peak and duration for the short acting insulin is 1-2 hr, 2-4 hrs, 5-10 hrs respectively and for the intermediate acting insulin ranges from 1-4 hours, 6-8 hours and 12-24 hours respectively. The newer synthetic insulin generally has a shorter duration than the former animal sourced insulin and further varies with individuals based on metabolic rate and absorption.
 - b. Ensure sufficient food intake and exercise, corresponds to the onset, peak and duration of the various insulin, monitor blood glucose levels
3. Administer 175 ml (3/4 cup) of orange juice. Recheck the blood glucose in 15 minutes. If blood glucose is not normal, administer a second glass of orange juice. Recheck blood glucose. If a meal is more than 1 hour away provide crackers (6) and cheese/peanut butter.

PART 4

ADDITIONAL SCENARIO INFORMATION

Mr. Wells has increasing edema in his lower limbs. The physician orders furosemide 20mg po daily. He has been receiving the medication for two weeks and there is little improvement. The order is changed to furosemide 40mg po daily.

1. Increased urinary output
Decreased edema upon visual inspection and palpation
Weight loss
Decreased blood pressure
Improved respiratory function
2. Possible hypokalemia from the furosemide and prednisone (especially in the absence of any potassium replacement therapy). The hypokalemia can cause muscle weakness and potentiate the effect of digoxin that could lead to toxicity. Nausea and visual disturbances are consistent with digitalis (digoxin) toxicity.

3.
 - a. This is likely oral thrush
 - b. It is a side effect of fluticasone.
 - c. Having Mr. Wells rinse his mouth with water after administration of the inhaler will decrease the risk.

4. Low dose ASA has antiplatelet properties and is prescribed to reduce the formation of clots for which Mr. Wells is at added risk because of his multiple health problems.

Dosage Calculation Answer Key

1. 8mL
2. 2.5 tabs
3. 1.5mL (1mL meperidine & 0.5mL dimenhydrinate)
4. 20mL
5. 20mL
6.
 - a) 1/2 tab
 - b) 1/2 tab
 - c) 0.6mL
 - d) 0.25mL
 - e) 20mL
7. 0.7mL
8. 0.4mL
9. 1.5mL
10. 0.25mL
11. 2.5mL
12. 2.6mL
13. 2.2mL
14. 1.25mL
15. 0.8mL
16. 120mL/hr
17. 31 drops/min (31.25 rounds down to 31)
18. 200mL/hr
19. 50mL/hr
20. 2g
50000mg
2000L
0.23mg
0.25g
2500g
500mL
0.02g
700mcg
8 oz
21. 2.5mL
22. 4mL
23. 3mL
24. 75mg
25. 1.25mL

Transcription Answer Key

1. Furosemide 20mg po od odd days.

It is possible that the intent was to administer the medication on alternate days. Since 31 and 1 are both odd; if given as ordered, the client will receive the medication 2 days in a row rather than every other day.

CLARIFY

2. Tobramycin 2 gtts tid a.s. for left eye drainage.

The order is incomplete in that it fails to indicate the dosage of tobramycin and number of days of administration prior to reassessment. Medications should be assessed for effectiveness within a set period of time (for example with antibiotics usually about 10 days). The order states to administer to left ear (a.s) yet the reason stated is for eye drainage. **CLARIFY**

3. Digoxin .25 mg od.

Leading zeros (o) should be used for numbers less than 1 to avoid a misinterpretation in dose strength. (i.e. 0.25 mg NOT 25 mg) If there is no institutional standard outlining under what conditions the drug is to be withheld (apical pulse less than 55), a conditional statement or additional assessment parameters are generally required for digoxin.

4. Nitro-Dur 0.4 mg/hr od.

The order is incomplete in that it fails to indicate whether the transdermal patch is to be removed after a set number of hours or left in place for the entire 24 hours. **CLARIFY**

5. Nitro Spray 0.4mg for angina prn

The order is incomplete in that it fails to indicate the number of metered dose sprays and the maximum number of permissible sprays per dose to achieve effectiveness. (i.e. If chest pain is not relieved with a maximum of 3 doses of 1-2 sprays per dose within 15 minutes contact prescriber. Each 2-spray dose should have a minimum 5-minute interval between each administration.) **CLARIFY**

6. Iron supps daily

The order is incomplete in that it fails to indicate the type iron i.e. ferrous gluconate, ferrous sulfate, strength, number of doses per day, route and general directions to be taken with meals, orange juice. "Supps" could be misinterpreted as suppositories rather than supplement. **CLARIFY**

7. Ativan 2.0 mg po for anxiety

A trailing zero after a decimal point should be avoided because overlooking the decimal point could result in a tenfold error in administration (i.e. 20 mg instead of 2 mg.) The order is incomplete in that it fails to note the frequency of administration. (i.e. PRN or regularly scheduled) **CLARIFY**

8. Prednisone 1/2 tab daily

The order is incomplete in that it fails to indicate the dosage strength. Medications frequently come in a variety of strengths. Prednisone, for instance is available in multiple strengths tablets, ranging from 1mg and 50mg strengths. **CLARIFY**

9 AZT 100 mg po od

Abbreviations are to be avoided to prevent possible drug confusion. In this case AZT may refer to azathioprine, zidovudine, or aztreonam. Writing the generic and trade name prevents the risk of misinterpretation. **CLARIFY**

Additional Medication Safety Resources

Institute of Safe Medication Practices <http://www.ismp.org/>

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Suite 302, Starlight Gallery, 7071 Bayers Road, Halifax, NS B3L 2C2
Tel: (902) 423-8517 • Fax: (902) 425-6811 • Toll Free in NS (800) 718-8517
info@clpnns.ca • www.clpnns.ca