

COLLEGE OF
LICENSED
PRACTICAL
NURSES
OF BC



PHARMACOLOGY AND MEDICATION ADMINISTRATION SELF-ASSESSMENT PROCESS



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Introduction

The College of Licensed Practical Nurses of British Columbia (CLPNBC) has determined that by January 1, 2006, all registrants require competency in medication administration. Refer to the [bulletin](#) dated April 30, 2004. [Evidence](#) of meeting these competencies must be available for submission upon request by the College and/or employers prior to the renewal registration date for January 2006. A resource has been prepared to assist registrants to meet the required competencies.

Purpose

This resource is designed to assist the registrant to:

- ◆ determine own learning needs,
- ◆ access continuing education resources,
- ◆ access possible sources of funding,
- ◆ add to personal professional portfolio of evidence, and
- ◆ prepare to successfully meet the competency requirements for licensure for 2006.

Registrants have graduated from a variety to programs over the course of many years. These programs may or may not have included the full range of required competencies.

Competencies

The required competencies are:

1. Basic Pharmacology
2. Gero-Pharmacology
3. Administration of intramuscular and subcutaneous injections and narcotics
4. Supporting intravenous therapy and blood products
5. Taking and transcribing physician's orders

Self-Assessment and Evidence

Self-Assessment

CLPNBC registrants first need to ascertain their outstanding learning needs related to meeting the competencies. A [self-assessment tool](#) is provided to facilitate the determination of individual learning needs. The chart that follows is an overview with the approximate year content was added to various Practical Nurse programs. The dates of implementation and the scope of the content vary. It may be necessary to contact the program of graduation to validate the course content. A [Course Content Validation Form](#) is available to submit to your school of graduation. Request an authorized representative from the school of graduation complete this form. The completed form helps validate your self-assessment and is to be added to your personal professional portfolio as evidence supporting completion of requirements for continuing competence.

SELF-ASSESSMENT TOOL TO DETERMINE UPGRADING NEEDS

The chart below is a guide to assist individuals in a self-assessment regarding upgrading courses required to meet competency requirements for Practical Nurse Licensure effective January 2006. Please refer to [Bulletin](#) dated April 30, 2004. The chart represents a general overview of approximate dates when respective content was added to curricula of Practical Nurse programs. Some programs included all or parts of the content therefore it is important to verify the curriculum content of the program from which the registrant graduated.

To use the chart, identify the year of graduation, follow the column downward. A check mark indicates **courses required** that correspond with the year of graduation. It is possible, in some cases that select components were not included in certain programs. For example, supporting intravenous therapy, regardless of the year of graduation, may not have been included in a core pharmacology course; therefore it is imperative to check with the program to determine the inclusiveness of content. In another situation if you graduated in 1999, it is *likely, but not guaranteed* that you completed course content related to Basic and Gero-Pharmacology, subcutaneous and intramuscular injections. It would be important to validate the content of the most recently added content i.e. intramuscular injections. This is also the case for upgrading courses completed since graduation.

Further, if you completed the course **but** have not utilized the competency in the past 5 years, the course must be retaken and/or refreshed to meet the 2006 competency requirements.

Year of Graduation		Pre 1984	1984-1995	1996-1999	2000-2001	2002 onward
		Courses required (✓) depending of year of graduation				
Course	Effective date of implementation					
Basic Pharmacology	1984	✓				
Gero-Pharmacology	1984	✓				
Subcutaneous Injections	1996	✓	✓			
Intramuscular & Narcotic Administration	1999/2000	✓	✓	✓		
Supporting Intravenous Therapy & Blood Products	2002	✓	✓	✓	✓	
Taking and Transcribing Medication Orders	2002	✓	✓	✓	✓	

Evidence

Direct evidence is defined as something that furnishes proof: testimony (first hand authentication of a fact).

Criteria:

- ◆ Evidence must be in the form of written testimony by a recognized expert in the competency being assessed.
- ◆ Documentation must be able to substantiate that the critical elements for a particular competency have been assessed and met consistently.
- ◆ Evidence of the critical elements must include
 - critical thinking,
 - personal recognition of competency deficits, and
 - self initiated resolution to overcome the competency deficits.

Sources of evidence

- ◆ Course completion documentation from a recognized educational institution that offers an accredited generic, access, or refresher Practical Nurse Program and upgrading courses from the respective continuing education departments.

The documentation can be:

- transcripts accompanied with course outlines that clearly delineate the course content,
 - a copy of the course application form signed and authenticated by the program designate following successful course completion,
 - completion and authentication of the [Course Content Validation Form](#).
- ◆ Prior Learning Assessment completed by a certified assessor.

Course Content Validation Form

If a registrant is unsure if content was included in a particular course that was completed at an accredited Practical Nurse Program (Generic, Access and/or Refresher) validation from the program can be requested. To obtain validation, a form is provided for the registrant to submit to the school of graduation.

The process is as follows:

1. The registrant/graduate requiring clarification:
 - a. downloads the [form](#)
 - b. completes section A
 - c. mails the form to the school with a stamped self-addressed envelope to the respective school
2. School representative completes section B, authenticates and returns to the registrant/graduate
3. Registrant/graduate has a record of course completion for inclusion in her/his professional portfolio

Registrant Name: _____

License Number: _____

COURSE CONTENT VALIDATION FORM

School of graduation: _____

Date of graduation: _____

Section A is to be completed by graduate			
Section A. Name of Graduate: _____		Date of Graduation: _____	
_____		Year of initial registration: _____	
Address: _____		Most recent year of registration: _____	
_____		Phone: _____	
_____		Fax: _____	
_____		Email: _____	
Section B is to be completed by authorized program representative			
Section B. Educational Institution Data:			
Name of School: _____			
Address of School: _____			

Contact person: _____			
Phone: _____	Fax: _____	Email: _____	
COURSE CONTENT INCLUDED			
YES	NO	Comments	
Basic Pharmacology			
Gero-Pharmacology			
Subcutaneous Injections			
Intramuscular & Narcotic Administration			
Supporting Intravenous Therapy & Blood Products			
Taking and Transcribing Medication Orders			
This form has been completed by:			
Name: _____			
Contact number/email: _____			
To the best of my knowledge the information provided is accurate:			
Signature of representative: _____			

Authentication: Seal:

Planning for Action

Once upgrading course requirements are identified, developing a plan for success is vital. Readiness to enroll in courses is preceded by good planning.

Plan to:

1. Determine your mathematical skill ability
2. Upgrade mathematic skills, as necessary
3. Determine need for Basic-Gero Pharmacology upgrading course
4. Review inventory of available upgrading courses
5. Obtain funding and/or ensure availability of sufficient funds
6. Determine the preferred method of course delivery
7. Review tips for success in the upgrading courses
8. Contact CLPNBC practice consultants, as necessary

1. Determine mathematical skill ability

In order to administer medications safely it is necessary to carry out fundamental mathematical calculations. To ensure you have the necessary skill set, complete the [Mathematics Self-Assessment](#) in the Appendix.

2. Upgrade mathematical skills, as necessary

Use the outcome of the self-assessment to identify your needs and select the appropriate course of action. You may be ready to enroll in the required upgrading courses or you may need to upgrade or refresh your mathematical abilities. [Recommendations and resources](#) for remediation are provided at the end of the mathematics self-assessment.

3. Determine need for Basic-Gero Pharmacology upgrading course

A self-assessment tool is one resource available to assist the registrant determine upgrading needs. An upgrading course is suitable for an individual who completed course requirements within the past five years but may have little to no experience administering medications. A [Pharmacology Upgrading Self-Assessment Tool](#) is a case scenario with questions and a [key](#) in the Appendix. This tool is one way to self-evaluate some components of competence in medication administration. The case scenario does not cover all aspects but rather reflects one situation in which the practitioner should be familiar with these commonly prescribed medications. If the registrant completed a pharmacology course more than five years ago and does not administer medications, upgrading is required prior to license renewal in 2006. A more comprehensive self-assessment can be completed by registering in a course at Vancouver Community College: Pharmacology Review: HLTH 1295.

4. Review inventory of available upgrading courses

Now that you are ready to enroll in courses or complete a prior learning assessment (PLA) process, review the [Pharmacology Upgrading Course Resource](#) located in the Appendix to determine the resource that best fits your needs. Be sure to consider the prerequisites (criteria that must be met before enrolling in a course). Make a copy of your current license since it needs to be submitted with most applications.

The pharmacology upgrading course resource is data gathered from the various education institutions' publications and is subject to change. The CLPNBC is not responsible for the accuracy and currency of the information. Contact the respective schools to confirm or clarify the information.

The pharmacology upgrading course resource identifies the:

- i. name and location of the course provider (educational institution)
- ii. contact person for further information
- iii. course name, number, credit value, course length and objectives
- iv. course availability and approximate cost as of November, 2004
- v. prerequisites
- vi. course format (method of delivery) and
- vii. current evaluation system for the specific course.

The course length varies according to the format of the course. For courses offered by distance, the time is quite long – this allows the learner to self-pace the completion of the work within a specified time frame. Make note if the length includes theory and practice (practicum), if applicable. The approximate cost, in most cases only covers tuition. Resources such as modules/manuals, textbooks and equipment are an additional cost.

5. Obtain funding and/or ensure availability of sufficient funds

The Nursing Directorate at the BC Government Health Services Ministry has an LPN Upgrading Initiative 2004/2005. The Nursing Directorate grants limited funds to eligible LPNs currently employed in BC health care settings in need of upgrading. Refer to the [website](#) for details and an [application form](#) for download.

The Nursing Directorate is also available at (1).250.952.3534.

Other financial assistance may be available. Check with the financial aid office at an approved BC public post secondary education institution with an accredited Practical Nurse program.

You will need to develop a budget and may need to secure additional financial resources prior to registering for the required courses to cover related costs. Your budget will vary depending on the number of upgrading courses required and your personal situation.

6. Determine the preferred method of course delivery

Courses are offered in various formats. The format you choose will be influenced by several factors. These may include, but are not limited to

- i. preferred learning style
- ii. personal commitments and need for a flexible schedule
- iii. resources i.e. transportation, support group, computer
- iv. practicum – location, availability

Each student has a way in which s/he learns best. Reflect on your past successful learning experiences to help determine what works best for you. If you like structured student teacher interactive learning, seek out onsite classroom based delivery of course material. If you prefer to learn independently, at your own pace, appreciate flexibility or need flexibility in your schedule, then self-paced distance format may be the best option. In some cases a combination of classroom based and distance format is also available.

The following glossary is a description of commonly used terms related to learning and course offerings.

GLOSSARY

TERM	DESCRIPTION
CLASSROOM BASED	This is a method of delivery that takes place at the educational institution's location or a designated alternative (i.e. education room at a hospital). This is instructor led with a fixed schedule. Learners will be required to prepare material in advance and engage in learning activities in the classroom.
DISTANCE	A learner enrolls in a course at an educational institution but completes studies at a remote location (i.e. at home). The learner's activities are guided by material received in print or electronic form (online). Evaluation of learning takes place by completing assignments, quizzes and exams. Assignments will be submitted by mail or electronically. Obtain specific details for completion of quizzes and exams from the course instructor. When selecting a course by distance make note if intermittent onsite attendance is necessary, and/or if practicum placements are required. Explore with the provider the implications for the learner when a supervised experience is part of the course. Ask if the learner is responsible for finding his or her own practicum placement or

does the course provider secure the placement; is an additional cost incurred for practicum placements.

EVALUATION	Evaluation is the way the learner's progress in the course is assessed. Assessment is in the form of learning activities, assignments, quizzes, exams, skills check, etc. Evaluation usually has several components. To pass the course a specified achievement such as a minimum percent on each assessment <u>plus</u> a minimum overall course average may be required. Make sure you are aware of the evaluation system at the beginning of the course. Should you be unable to participate in any one of the components at the scheduled time, notify the course instructor immediately.
LEARNING ACTIVITIES	Most courses involve exercises to guide the learner in acquiring, organizing, understanding and applying new knowledge. These structured exercises may or may not be part of the evaluation system for the course. The learning activities could be answering sets of questions, completing information related to a case study, figuring out specific problems, completing dosage calculations for medication administration, etc.
MODULES	Modules/units are ways in which course content is organized. The content is usually organized from basic course information to more advanced content.
ONSITE	Indicates the learner must be present at a location where course content is delivered. It is usually at the educational institution's facility or a designated location such as the workplace.
ONLINE	Online (web-based) is a form of distance delivery of course material. In order to complete courses online, the learner requires: a computer, reasonable computer skills in managing basic software programs and internet access. Owning a personal computer is not necessary if the learner has access at the workplace, local library, community college, etc. To ensure successful completion of an online course, confirm the computer specifications required before registering for the course.
PRACTICUM	This is a supervised learning experience in a reality environment. It allows the learner to apply theory in a practice setting other than the learner's workplace. The learner receives immediate feedback

and must provide evidence of safe and competent practice with a view to meet the intended learning outcomes of the course. Check if the course length and tuition cover the practicum experience.

PRE-REQUISITES

Refers to criteria that must be met prior to enrolling in a particular course. Pre-requisites could include a current practicing license, knowledge level such as basic pharmacology course prior to enrolling in a more advanced content like taking and transcribing medication orders.

PRIOR LEARNING ASSESSMENT (PLA)

PLA is a process used to assess and recognize an individual's learning derived from previous credit or non credit, formal or informal lifelong learning such as on the job training, education in a foreign country, education originally intended for a different vocation, etc.

PROFESSIONAL PORTFOLIO

The registrant's record of evidence to support continuing competence. The portfolio includes transcripts, documentation of course completion, certificates, letters of participation in educational offerings, etc.

SELF-ASSESSMENT

Self-assessment is a way to learn about yourself. The information gathered is for one's own use and not for evaluation purposes. Focused tools in the form of questionnaires, charts, application exercises, etc are available for individuals to self-determine personal strengths and areas to develop. The individual seeks out tools that will provide specific information about certain abilities such as mathematics, literacy, application of knowledge, etc. The feedback gathered is used to help guide a plan of action to enhance areas of identified need.

SELF-PACED

A course has a designated time frame within which the course must be completed after the date of registration. Recommended schedules for completing units/modules are usually provided with the course material. Self-paced courses allow learners some flexibility in setting their own schedules, within reason. Self-pacing works well for the self-directed, self-disciplined learner who makes realistic and attainable goals. This is helpful when personal commitments may interfere with adhering to a fixed schedule such as classroom-based courses offered at regularly scheduled intervals. With a self-paced format, the learner needs to

plan for sufficient time to adequately complete the course work and consolidate the learning before quizzes and exams. If the course time frame is nearing expiration and it appears that the learner is unable to complete within the designated time, contact the course teacher immediately to discuss possible options. Extensions, in some cases, may be negotiated with the course provider.

- SKILLS CHECK** A scheduled session for a group of learners following instruction in a particular skill such as intramuscular injections. This session generally takes place onsite following successful completion of the theory component or at the end of a skills workshop.
- SYLLABUS** Refers to an outline/overview of the course that will provide the course name and number, course contact person, pre-requisites, course length, course description with objectives/intended outcomes, method of delivery of course content, evaluation of the course and resources required for the course.
- TUTOR** A tutor is an individual who is an expert in the field of study. The expert is available to guide the learner's focused study. A tutor is available with most distance courses. The tutor is generally available for a designated period at regular intervals, for example, weekly on Tuesday and Thursday 1600 -1800 by telephone or online (in a "chat room" or by e-mail).
- TUTORIAL** This is a learning session used as an adjunct to distance learning that focuses on more difficult or complex concepts. It is a learning session with a tutor who helps explain and clarify areas identified by the learner. It usually involves a small group of people. Tutorials may be optional or required.
- WORKSHOP** A workshop is a scheduled session for a group of learners offered at a set location – at the educational institution or designated alternative such as the workplace - over an abbreviated period ranging from several hours to a couple of days. The session is concentrated and focused on particular content, which is usually followed by an evaluation that may include a test and/or skills check component.

TIPS FOR SUCCESS IN LEARNING

Depending on how recently you completed a formal course, the ease of returning to a formal learning process will vary. The following tips may serve to facilitate your success. Some of the tips focus on facilitating learning in a self-paced format, however most apply to any form of learning.

- ◆ *Get organized in your pursuit of meeting the competencies.* A [checklist](#) is available in the Appendix to help you keep track of your plan and progress in achieving your goals.
- ◆ *Get input from former students of the course.* Find out where the easy spots and hard spots are. Ask previous learners where they thought “if only I had known that ...”
- ◆ *Familiarize yourself with the course design.* Spend time looking at the course syllabus even before you register. Decide if you can be a successful self-directed learner in this particular study content.
- ◆ *Be realistic.* If there is insufficient time in your personal schedule to do the work of the course, you will be frustrated. You will not have to keep a class attendance schedule, but you will have to do regular academic work.
- ◆ *Set interim goals and deadlines.* Thinking about doing the whole course can be overwhelming. Accomplishing parts of it in reasonable time periods is encouraging and constructive.
- ◆ *Organize your goals in a study schedule.* Remember you should be spending at least two study hours each week for every credit you are taking. Identify study times when you are fresh and attentive and stick to those times every week.
- ◆ *Stay in touch with your instructor.* Visit or call your assigned instructor regularly. Sometimes you may think you are not even sure about how to ask a question about your work. That is when the teacher can help most!
- ◆ *Evaluate your progress regularly.* Re-read the course objectives and standards often to see how you are progressing with them.
- ◆ *Keep aware of your materials.* Distance learning courses have many different materials. Remember you are not just watching or listening. You are learning from those various materials. Take notes. Imagine questions that might be on a test from your study guide, from your textbook, etc.

- ◆ *Time your tests wisely.* Be sure you have mastered the material that will be the basis for a particular test before you take that test. Don't be in too much of a rush; that can lead to sloppy and ineffective testing.
- ◆ *Set deadlines for yourself, and stick to them.* Keep a calendar showing the number of weeks in the session and mark it off with the amount of work you need to do each week. Mark in the days when you will expect to take tests, submit projects, contact the instructor.
- ◆ *Find some study-buddies.* If you need the companionship of other learners for academic success, ask your instructor for help in identifying other students who may want to work with you.
- ◆ *Discuss your progress.* Ask your instructor at various points in the course how your progress is going. Point out areas that you think are difficult or unclear. Ask for help. You are in charge here. The instructor is your coach but you have to execute the plays.
- ◆ *Find your most effective motivators.* What makes you persevere at a task? Do you get excited when you master a skill? Do you need a reward? Will promising yourself a pleasant diversion increase your concentration? Eg "I'll study for two solid hours, and then I'll call my friend who is just back in town." Don't make the phone call before you study; it is too likely you will wind up dropping the books to meet with your friend. Remember the importance of sticking to a schedule. Pretend you really are in class when you are scheduled to do your course work.
- ◆ *Other support resources.* Have a designated workspace that is free from distraction and interruption. Get your family members on board. Commit time to them after you have met a goal, follow through and enjoy your time together. Arrange work commitments to facilitate your success. Taking a vacation day at set intervals to allow for a concentrated period of study, preparing for exams, is a useful strategy.
- ◆ *Professional resource.* Contact CLPNBC practice consultants, as necessary. Practice Consultants at CLPNBC are available to assist you with further questions. Contact the practice consultants at 604.660.5750 or Toll-free: (BC) 1.888.440.6900, or www.clpn.bc.ca.

FREQUENTLY ASKED QUESTIONS

1. My employer does not recognize medication administration as part of the LPN role. Do I still need to take the education?

Yes. This upgrade is a requirement for registration and is separate and independent from employer requirements. CLPNBC has mandated this upgrade for all LPNs in BC.

2. Will I have to take the education again in five years if I do not administer medications?

Continuing education in pharmacology will be incorporated into the Continuing Competence Program; this program is currently under revision.

3. My employer provided “in-house” education on pharmacology. Is that acceptable?

CLPNBC requires that any education regarding pharmacology and medication administration be “formalized,” therefore content must be consistent with or delivered in collaboration with a school offering the pharmacology upgrade for LPNs. Please ensure that the education your employer is offering includes a contractual arrangement with an educational institution that offers a PN program or a reference course number available through an educational institution that offers the PN program.

4. I am an LPN but I work as an unregulated care provider and I administer medications. I have not taken the education. Do I need to?

Yes. You may work in a role as an unregulated care provider but as a registrant of CLPNBC you are held to the Standards of Professional Practice expectations for LPNs in BC. As an LPN You may not perform any function for which you are not educationally prepared.

5. In my role I do not provide direct patient care. Do I still have to take the education?

Yes. As an LPN you may work in a variety of domains i.e. direct patient care, education, administration and research. Regardless of your role, the mandatory requirement of pharmacology and medication administration pertains to all registrants holding a “FULL” practicing license with CLPNBC. You will need evidence in your professional portfolio by January 1, 2006 that you have the full competencies in pharmacology and medication administration.

Appendix

- ◆ [Checklist to Meet Medication Administration Competencies](#)
- ◆ [Course Content Validation Form](#)
- ◆ Self-Assessment
 - ✎ [Mathematics Self-Assessment](#)
 - 🔑 [Mathematics Self-Assessment - Key](#)
 - ✎ [Pharmacology Upgrading Self-Assessment](#)
 - 🔑 [Pharmacology Upgrading Self-Assessment - Key](#)
 - ✎ [Supporting IV Therapy and Blood Products Self-Assessment](#)
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 - 🔑 Section III: Self-Assessment – Key: [A](#), [B](#), [C](#)
- ◆ [Pharmacology Upgrading Course Resource](#)

CHECKLIST OF PROGRESS TO MEET MEDICATION ADMINISTRATION COMPETENCIES

A: Plan for action

Competency related activities	Action / Date
<input type="checkbox"/> Self – assessment re: required upgrading courses	
<input type="checkbox"/> Mathematical skill ability self – assessment	
<input type="checkbox"/> Self-recommendation:	
<input type="checkbox"/> Remediation	
<input type="checkbox"/> Refresher	
<input type="checkbox"/> Math skills at competency level	
<input type="checkbox"/> Pharmacology upgrading self - assessment	
<input type="checkbox"/> Course content validation form	
<input type="checkbox"/> Reviewed available courses	
<input type="checkbox"/> Pre-requisites met, license copied	
<input type="checkbox"/> Funding and support resources in place	
<input type="checkbox"/> Budget	
<input type="checkbox"/> Nursing Directorate – eligible for funds, download form, completed application faxed	
<input type="checkbox"/> Other funding sources	
<input type="checkbox"/> Time line in place to meet requirements for January 2006	
<input type="checkbox"/> Enrolled in required courses	
<input type="checkbox"/> Courses completed, update professional portfolio	

B: Professional Portfolio:

<input type="checkbox"/> Evidence of completed competencies	
<input type="checkbox"/> Documentation of completed courses	
<input type="checkbox"/> Course content validation form – authenticated	
<input type="checkbox"/> PLA	

Registrant Name: _____

License Number: _____

COURSE CONTENT VALIDATION FORM

School of graduation: _____

Date of graduation: _____

Section A is to be completed by graduate			
Section A. Name of Graduate: _____		Date of Graduation: _____ Year of initial registration: _____ Most recent year of registration: _____	
Address: _____ _____ _____		Phone: _____ Fax: _____ Email: _____	
Section B is to be completed by authorized program representative			
Section B. Educational Institution Data:			
Name of School: _____			
Address of School: _____ _____			
Contact person: _____			
Phone:	Fax:	Email:	
COURSE CONTENT INCLUDED	YES	NO	Comments
Basic Pharmacology			
Gero-Pharmacology			
Subcutaneous injections			
Intramuscular & Narcotic Administration			
Supporting Intravenous Therapy & Blood Products			
Taking and Transcribing Medication Orders			
This form has been completed by:			
Name: _____			
Contact number/email: _____			
To the best of my knowledge the information provided is accurate:			
Signature of representative: _____			

Authentication: Seal:

MATHEMATICS SELF ASSESSMENT

To help determine the areas you may need to review and or upgrade, complete this self-assessment and check your responses with the answer key provided at the end of the questions. Complete the self-assessment without the use of a calculator. Validate responses with a calculator.

Add the following:			
1.	$3.04 + 1.865$	2.	$25.7 + 3.008$
Subtract the following:			
3.	$3 - 0.04$	4.	$0.96 - 0.1359$
Multiply the following:			
5.	0.003×1.2	6.	3×0.5
Divide the following and carry to the third decimal place:			
7.	$201.1 \div 20$	8.	$20.6 \div 0.21$
Write the following as decimals:			
9.	Fourteen hundredths	10.	Three and sixteen thousandth
Change the following decimals to fractions:			
11.	0.70	12.	0.492
Change the following to decimals:			
13.	$\frac{23}{43}$	14.	$9 \frac{1}{8}$
15.	Write 17% as a decimal and as a fraction.		
16.	Write $\frac{1}{8}$ as a decimal and as a percent.		
17.	Write 0.014 as a fraction and as a percent.		
Change to whole or mixed numbers:			
18.	$\frac{25}{4}$	19.	$\frac{36}{7}$
Change to improper fractions:			
20.	$4 \frac{2}{9}$	21.	$9 \frac{1}{2}$
Find the lowest common denominator (bottom number) in the following fractions:			
22.	$\frac{4}{11}$ and $\frac{1}{6}$	23.	$\frac{2}{5}$ and $\frac{5}{9}$
Add the following numbers:			
24.	$\frac{1}{5} + \frac{1}{6} + \frac{2}{3}$	25.	$1 \frac{1}{2} + 3 \frac{1}{8} + 2 \frac{1}{6}$

Subtract the following:

26. $\frac{5}{7} - \frac{1}{4}$

27. $8\frac{1}{4} - 3\frac{3}{8}$

Multiply the following and reduce to lowest terms:

28. $\frac{1}{6} \times \frac{1}{2}$

29. $\frac{2}{8} \times 1\frac{1}{3}$

Divide the following and reduce to lowest terms:

30. $\frac{1}{3} \div \frac{2}{5}$

31. $1\frac{1}{8} \div 2\frac{1}{2}$

Reduce the following fractions to lowest terms:

32. $\frac{3}{150}$

33. $\frac{4}{19}$

Find the following percentages:

34. 15% of 63

35. $1\frac{3}{4}$ % of 4210

Change the following to a ratio expression:

36. 0.3

37. $\frac{1}{100}$

38. 2.5%

39. 0.02%

Express each of the following measures in their three mathematic equivalents. Reduce to simplest terms where appropriate:

	A. Percent	B. Ratio	C. Common Fraction	D. Decimal
40.	0.01%			
41.		1:2000		
42.			$\frac{1}{3}$	
43.				0.15

Change the following Roman numerals to a numeric expression:

44. IV

45. XL

Express the following as a decimal

46. 2.56×10^{-5}

Express the following scientific notation as a decimal:

47. 6.5×10^5

48. Convert 5.5 parts per million into decimal and scientific notation forms

MATHEMATICS SELF-ASSESSMENT

KEY

1.	4.905	2.	28.708	3.	2.96
4.	0.8241	5.	0.0036	6.	1.5
7.	10.055	8.	98.095	9.	0.14
10.	3.016	11.	$\frac{7}{10}$	12.	$\frac{123}{250}$
13.	0.534	14.	9.125	15.	0.17 and $\frac{17}{100}$
16.	0.125 and 12.5%	17.	$\frac{14}{1000}$ and 1.4%	18.	$6\frac{1}{4}$
19.	$5\frac{1}{7}$	20.	$\frac{38}{9}$	21.	$\frac{19}{2}$
22.	66	23.	45	24.	$1\frac{1}{30}$
25.	$6\frac{19}{24}$	26.	$\frac{13}{28}$	27.	$4\frac{7}{8}$
28.	$\frac{1}{12}$	29.	$\frac{1}{3}$	30.	$\frac{5}{6}$
31.	$\frac{18}{40}$ or $\frac{9}{20}$	32.	$\frac{1}{50}$	33.	$\frac{4}{19}$
34.	9.45	35.	73.675	36.	3:100
37.	1:100	38.	1:40	39.	1:5000
40.	B: 1:1000 C: $\frac{1}{10,000}$ D: 0.0001	41.	A: 0.05% C: $\frac{1}{2,000}$ D: 0.0005	42.	A: 33.3% B: 1:3 D: 0.33
43.	A: 15% B: 3:20 C: $\frac{3}{20}$	44.	4	45.	40
46.	0.0000256	47.	650 000	48.	0.000,00055; 5.5×10^{-6}

If the results of the self-assessment suggest remedial work is required, several options should be considered. Determine the:

- degree of difficulty experienced and
- number and types of errors made.

If remediation is required, consider the following recommendations.

Recommendations and Resources:

- A. If a few minor errors were made related to a limited number of concepts then a refresher would be helpful prior to enrolling in a pharmacology upgrading course. A refresher can be accomplished with self-directed activities. For example, review the mathematics section in a pharmacology/medication administration book that has a comprehensive unit on calculations/mathematics used in medication administration.

Two commonly recommended such books include but not limited to, are:

1. Math for Meds by A. Curren and L. Munday (Wallcur, Inc.)
2. Dosage Calculations Made Incredibly Easy (Springhouse).

These and other resources are available for purchase by personal or online shopping at a local educational institution Health Science Bookstore, or retail outlets such as Chapters (www.chapters.ca), LoginBrothers (<http://www.lb.ca/>), www.Amazon.com etc. You may also borrow similar books from a library of a community college that offers Health Science programs.

- B. Upgrading the required mathematics skills can also be accomplished by enrolling in a formal mathematics refresher course such as

1. PNAP 100 at BCOU (distance format) www.bcou.ca *or*
2. MATH 1054 at VCC www.vcc.ca.

- C. A further option includes upgrading by enrolling in an Adult Basic Education mathematics course at a local community college or continuing education night school.

PHARMACOLOGY UPGRADING SELF ASSESSMENT

The following case scenario is a resource to assist registrants' to self-assess their competency related to medication administration. Registrants who completed the course requirements for competency for medication administration several years earlier but administer medications infrequently or not at all may find the following exercise useful in determining their level of competency.

Complete the exercise applying your working knowledge of the medications. A key is provided to assess your responses.

The scenario depicts some of the most commonly prescribed medications for clients with commonly occurring conditions in a residential care facility. Determining the ease and completeness of answering the questions will help the registrant determine which upgrading course, if any, would best meet the registrant's learning needs. Upgrading to meet the medication competency may include a review course or the basic-gero pharmacology course. Refer to the pharmacology upgrading course resource for details about specific offerings.

Case Scenario

Answer the questions in the context of this scenario.

Mr. Wells is a long time resident 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, congestive heart failure and chronic obstructive pulmonary disease.

When you initially started caring for Mr. Wells, his medications included the following:

- Lanoxin 0.125 mg od
- Nitro-Dur 0.4 mg/hr for 12 hrs/day
- Albuterol MDI 2 puffs tid
- Fluticasone MDI 2 puffs bid
- Glyburide 10 mg bid
- Prednisone 40 mg po od
- Alendronate 10 mg po od
- Tylenol #3 tabs ii @ hs & q 6h prn
- ASA 81 mg po od

Bowel protocol as follows:

Level I

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

Level II

- Docusate 100 mg po bid with meals
- Sennosides 12 mg 1-2 tabs or Cascara 5-10 mls at hs
- If no BM for further 24-48 hrs; move to Level III

Level III

- Docusate 200 mg po bid (with meals)
- Sennosides 12 mg 2-3 tabs or Cascara 10-20 mls at hs
- Bisacodyl 10 mg supp and Glycerine (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.

1. Why would Mr. Wells have lanoxin prescribed?
2. What are the nursing responsibilities related to lanoxin administration?
3. Lanoxin is stocked in 0.25 mg tablets. How many tablets would the nurse administer to Mr. Wells?
4. a) What is Nitro-Dur?
b) Why would Mr. Wells have such an order?
c) Why is Nitro-Dur removed after 12 hours?
5. Mr. Wells has an order for Nitro-Dur 0.4mg/hr. What nursing actions are necessary to administer Nitro-Dur for Mr. Wells to achieve optimal results?
6. Mr. Wells has albuterol and fluticasone MDI ordered. What is MDI?
7. Why does Mr. Wells have these two inhalers prescribed?
8. Identify the sequence and the reason for the sequence (order) in which the inhalers should be administered when the times coincide.
9. What is the reason Mr. Wells receives prednisone?
10. Identify common side effects of prednisone.

Mr. Wells was ordered to fast for a diagnostic test.

11. How would the nurse handle Mr. Wells' medications that are routinely administered during the fasting period?
12. Of the medications ordered, is any of particular concern if not administered as scheduled during the fasting period? If yes identify and explain.

13. What is the reason Mr. Wells receives alendromate?
14. Mr. Wells is on bowel protocol. His last bowel movement was 48 hours ago. From the orders, identify the medications and the time they are to be administered.
15. Why does Mr. Wells require an order for bowel protocol?
16. What is the composition of Tylenol #3?
17. Mr. Wells receives glyburide. How does this medication work?
18. Glyburide is available in 5 mg tablets. How many tablets are required per day for Mr. Wells?
19. On the morning when Mr. Wells is fasting and medications are withheld, which is Mr. Wells more likely to experience, hypoglycemia or hyperglycemia?

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

20. What could be responsible for elevating Mr. Wells' blood glucose levels?
21. What does the nurse need to know about the ordered insulin?
22. What measures are instituted if Mr. Wells is conscious and his blood glucose level is 3.5 mmol/L (normal is 4-6 mmol/L)?

Mr. Wells has increasing edema in his lower limbs. The physician orders furosemide 20 mg od. Two weeks later there is little improvement so the order is changed to furosemide 40 mg od.

23. What assessments would support a therapeutic effect of the furosemide?
24. Mr. Wells complains of weakness, nausea and visual disturbances. Reviewing his medication profile what drug-drug processes could account for such changes in the client?
25. Mr. Wells has also been found to have a white plaque coating his mouth that is not removable with brushing. What could be responsible for this change in his oral cavity?
26. Mr. Wells receives ASA 81 mg od. What is the rationale for this order?
27. What are the rights of medication administration?

PHARMACOLOGY UPGRADING SELF ASSESSMENT

KEY

The following case scenario is a resource to assist registrants' to self-assess their competency related to medication administration. Registrants who completed the course requirements for competency for medication administration several years earlier but administer medications infrequently or not at all may find the following exercise useful in determining their level of competency.

The scenario depicts some of the most commonly prescribed medications for clients with commonly occurring conditions in a residential care facility. Determining the ease and completeness of answering the questions will help the registrant determine which upgrading course, if any, would best meet the registrant's learning needs. Upgrading to meet the medication competency may include a review course or the basic-gero pharmacology course. Refer to the pharmacology upgrading course resource for details about specific offerings.

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- Docusate 200 mg po bid (with meals)
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- Bisacodyl 10 mg supp and Glycerine (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.

1. Why would Mr. Wells have lanoxin prescribed?

To improve the contractility of his heart muscle resulting in improved cardiac output. Mr. Wells has congestive heart failure that is 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.

2. What are the nursing responsibilities related to lanoxin administration?

Determine apical heart rate for one full minute and withhold the medication if the rate is less than 60 beats per minute or otherwise ordered. The physician should be notified if Mr. Wells exhibits alterations in his rate, rhythm, and quality of pulse.

3. Lanoxin is stocked in 0.25 mg tablets. How many tablets would the nurse administer to Mr. Wells?

$$\frac{D}{H} \times Q = X \qquad \frac{0.125 \text{ mg} \times 1}{0.25 \text{ mg}} = 0.5 \text{ tab}$$

4. a) What is Nitro-Dur?

Nitro-Dur is a transdermal patch applied whose pharmaceutical preparation is time released for absorption while in contact with the skin.

- b) Why would Mr. Wells have such an order?

Nitro-Dur is used to vasodilate coronary arteries to deliver an increased supply of oxygenated blood to myocardial cells.

- c) Why is Nitro-Dur removed after 12 hours?

Removing Nitro-Dur after 12 hours reduces the development of tolerance to the medication that would ultimately require higher doses.

5. Mr. Wells has an order for Nitro-Dur 0.4mg/hr. What nursing actions are necessary to administer Nitro-Dur for Mr. Wells to achieve optimal results?

1. *Apply to any hairless site (avoiding distal sites), press firmly with the palm of your hand, circle outside edge with 1-2 fingers*
2. *Rotate sites to avoid skin irritation*
3. *If the patch becomes loose throughout the day, replace*
4. *Remove as directed*

6. Mr. Wells has albuterol and fluticasone MDI ordered. What is MDI?

MDI refers to the method of delivery, which is metered dose inhaler. This is a form of medication delivery that releases a set amount of medication with each compression of the inhaler canister.

7. Why does Mr. Wells have these two inhalers prescribed?

Mr. Wells has chronic obstructive pulmonary disease, which is bronchoconstriction that results in decreased exchange of gases at the alveolar level. It is 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. Identify the sequence and the reason for the sequence (order) in which the inhalers should be administered when the times coincide.

Albuterol is administered first to relax smooth muscle of the bronchi and open the airways to permit optimal distribution and absorption of fluticasone.

9. What is the reason Mr. Wells receives prednisone?

Prednisone is a systemic corticosteroid that further reduces the inflammatory process in the bronchi easing Mr. Wells' respiratory effort.

10. Identify common side effects of prednisone.

Cushingoid syndrome – moon face, fat redistribution, buffalo hump, etc, osteoporosis, hypertension, hypokalemia, hyperglycemia, gastric ulcer, edema, immunosuppression, edema, parchment paper like skin, cataracts.

Mr. Wells was ordered to fast for a diagnostic test.

11. How would the nurse handle Mr. Wells' medications that are routinely administered during the fasting period?

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.

12. Of the medications ordered, is any of particular concern if not administered as scheduled during the fasting period? If yes, identify and explain.

Prednisone is of particular concern since the ordered dose 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.

13. What is the reason Mr. Wells receives alendromate?

To counteract the effect of corticosteroid induced osteoporosis.

14. Mr. Wells is on bowel protocol. His last bowel movement was 48 hours ago. From the orders, identify the medications and the time they are to be administered.

Level II protocol is to be followed. Administer docusate 100 mg at 0800 and 1700. At 2200 administer sennosides 12 mg 2 tablets. Cascara 5-10 mls can be given instead of sennosides if Mr. Wells prefers.

15. Why does Mr. Wells require an order for bowel protocol?

Several factors predispose Mr. Wells to constipation. These may include decreased bowel motility due to various health problems such as diabetes, he may not have sufficient fluid intake, his activity may be decreased reducing peristaltic activity and side effects of medications, in particular Tylenol #3.

16. What is the composition of Tylenol #3?

Acetaminophen 300 mg and Codeine 30 mg in each tablet.

17. Mr. Wells receives glyburide. How does this medication work?

It lowers blood glucose by:

1. *stimulating pancreatic release of insulin*
2. *increasing the sensitivity to insulin at receptor sites*
3. *some reduction of hepatic glucose formation*

18. Glyburide is available in 5 mg tablets. How many tablets are required per day for Mr. Wells?

Glyburide 10 mg bid = 20 mg per day / 5 mg tablets = 4 tablets per day.

19. On the morning when Mr. Wells is fasting and medications are withheld, which is Mr. Wells more likely to experience, hypoglycemia or hyperglycemia?

Hyperglycemia

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

20. What could be responsible for elevating Mr. Wells' blood glucose levels?

- *Noncompliance to prescribed diet*
- *Side effects of medications such as prednisone*
- *Decreased exercise*
- *Presence of stress and/or an infection*

21. What does the nurse need to know about the ordered insulin?

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 in the stated ratio of 70% intermediate insulin and 30% short acting insulin. 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 ½ 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 insulins generally have a shorter duration than the former animal sourced insulins and further vary with individuals based on metabolic rate and absorption. Risk for hypoglycemic reactions due to insufficient food, increased exercise, excessive insulin, and /or insulin with oral hypoglycemics corresponds to the onset, peak and duration of the various insulins.

22. What measures are instituted if Mr. Wells is conscious and his blood glucose level is 3.5 mmol/L (normal is 4-6 mmol/L)?

Administer a glass of orange juice. Recheck the blood glucose in 10 minutes. If a meal is to arrive within 30 minutes, this is sufficient if the blood glucose returns to the normal range. If blood glucose is not normal, administer a second glass of orange juice. Recheck blood glucose. If a meal is not imminent then provide crackers (6) and cheese/peanut butter.

Mr. Wells has increasing edema in his lower limbs. The physician orders furosemide 20 mg od. Two weeks later there is little improvement so the order is changed to furosemide 40 mg od.

23. What assessments would support a therapeutic effect of the furosemide?

1. *Increased urinary output*
2. *Decreased edema upon visual inspection and palpation*
3. *Weight loss*
4. *Decreased blood pressure*
5. *Improved respiratory function*

24. Mr. Wells complains of weakness, nausea and visual disturbances. Reviewing his medication profile what drug-drug processes could account for such changes in the client?

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 lanoxin that could lead to toxicity. Nausea and visual disturbances are consistent with digitalis (lanoxin) toxicity.

25. Mr. Wells has also been found to have a white plaque coating his mouth that is not removable with brushing. What could be responsible for this change in his oral cavity?

Mr. Wells is at risk for developing oral thrush, a side effect of fluticasone. Rinsing his mouth with water after administration of the inhaler will decrease the risk.

26. Mr. Wells receives ASA 81 mg od. What is the rationale for this order?

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.

27. What are the rights of medication administration?

1. ✓ *RIGHT DRUG*
2. ✓ *RIGHT CLIENT*
3. ✓ *RIGHT DOSE*
4. ✓ *RIGHT DAY & TIME*
5. ✓ *RIGHT ROUTE*
6. ✓ *RIGHT DOCUMENTATION*
7. ✓ *RIGHT REASON*

References include but not limited to:

- Karch, A.M. (2004). *Focus on Nursing Pharmacology*, Lippincott
Deglin, J., & Vallerand, A. (2004) *Davis's Drug Guide for Nurses*, F.A. Davis

SUPPORTING INTRAVENOUS THERAPY AND BLOOD PRODUCTS
SELF-ASSESSMENT

Consider the following statements, indicate whether they are true or false and support your position with rationale.

1. All intravenous (IV) solutions are available in plastic bags.
2. All elderly clients should have a micro drip chamber when receiving an IV solution.
3. All IV solution bags should be time taped.
4. IV securement tape should be changed every 24 hours to reduce infection at the IV site.
5. IV tubing should be changed q 72 hours.
6. When a secondary set is used to administer an IV solution, the secondary set is positioned higher than the primary set.
7. Albumin, a blood product needs to be typed and cross-matched to the client prior to administration.

Provide the best response for the following questions.

8. Clients who develop fluid overload with administration of IV fluids are described as having a _____ fluid balance.
9. When the needle tip has penetrated the vessel wall and the IV solution leaks into the tissues, this is described as _____.
10. When an IV is running by gravity and the rate fluctuates, identify the appropriate interventions to facilitate optimal flow.

11. Which of the following can occur as complications of IV therapy?

- Aspiration
- Embolism
- Infection
- Phlebitis
- Pulmonary edema

12. For each of the complications selected above, provide an explanation as to how the complications might occur.

13. If there is evidence of a blood transfusion reaction, the initial response is to

- a. call the doctor
- b. contact the lab
- c. recheck the cross match data
- d. reduce the rate
- e. stop the transfusion

14. A blood transfusion is initiated at a slower rate to

- a. assess client response
- b. avoid chilling the client (inducing hypothermia)
- c. avoid overloading the vascular system
- d. prevent development of thrombophlebitis at the site

Mr. Best is your assigned client. He has been suffering with symptoms of the flu for the past several days. His symptoms include cough, nausea, vomiting, diarrhea and a low-grade fever. The following IV orders are noted:

- Give 3 liters of IV of 2/3's DW and 1/3 Saline with 20 mmols of KCl per liter per 24 hours
- Intake and Output

15. Calculate the drop factor using a 10gtt/ml, 15gtt/ml and 60gtt/ml infusion set.

16. Explain which calibration set would be used to administer Mr. Best's IV therapy.

17. The order states:

Give 3 liters of IV of 2/3 DW and 1/3 Saline with 20 mmols of KCl per liter per 24 hours.

What information will be on the label of the IV solution that matches the prescribed solution?

18. What would the label state if only 500 ml bags are available?

19. What information is required prior to starting this solution and why?

20. Why is the client having potassium added to his IV?

21. Despite the administration of several liters of fluid, Mr. Best's urinary output is low. The physician orders a 250 ml bolus of Normal Saline. What is this bolus and why is it ordered?

22. In the past 24 hours Mr. Best received the bolus of Normal Saline over one hour and subsequently the IV went interstitial. A time frame of 4 hours elapsed before the IV was restarted.
For the 24-hour period including these events, how much KCl did Mr. Best receive?

23. How much IV fluid did Mr. Best receive in the same 24-hour period?

24. Mr. Best's IV orders are changed to KVO. What is KVO and how is it determined?

25. Mr. Best is now tolerating fluids and small portions of meals. The order is to convert the IV to a saline lock. What are possible reasons for this order?

26. A new order states: Administer 100 mls of Normal Saline in 30 minutes. Using a calibration set of 10 gtts/ml what will the drop rate be to administer the Normal Saline?

27. What are the associated responsibilities of caring for an intermittent infusion device (saline/med lock) to ensure its patency?

SUPPORTING INTRAVENOUS THERAPY AND BLOOD PRODUCTS
SELF-ASSESSMENT - KEY

Consider the following statements, indicate whether they are true or false and support your position with rationale.

1. All intravenous (IV) solutions are available in plastic bags.

False

Some solutions are incompatible with plastic thus are supplied in glass bottles.

2. All elderly clients should have a micro drip chamber when receiving an IV solution.

False

The drop factor in the drip chamber is selected based on the volume and degree of control required over the intravenous solution administration. For example, If a small volume in a specified time such as 25 ml/hr is prescribed, a microdrip(60 gtt/ml) would be the appropriate selection. The following calculation facilitates the decision making process.

$$\text{Formula: } \frac{\text{Hourly Volume} \times \text{Calibration}}{\text{Time (min)}} = \text{Flow rate (gtt/min)}$$

Based on a 10 gtt/ml, the rate would be:

$$\cdot 25 \text{ cc} \times 10 \text{ gtt/ml}/60 \text{ min} = 4 \text{ gtt/min.}$$

This drop rate would be difficult to regulate and monitor.

Whereas *a 60 gtt/ml would be:*

$$\cdot 25 \text{ cc} \times 60 \text{ gtt/ml}/60 \text{ min} = 25 \text{ gtt/min.}$$

This drop rate allows for greater accuracy and control over the administration of the fluid.

3. All IV solution bags should be time taped.

True

When using gravity controlled administration the time tape facilitates accurate administration of the solution. If an electronic infusion device is used, taping the bag is unnecessary as the infusion device has the capacity to electronically control the infusion as well as total the volume infused.

4. IV securement tape should be changed every 24 hours to reduce infection at the IV site.

False

The site is regularly assessed (i.e. q1h or as per agency policy). The tape stabilizing the IV site is left intact unless it becomes loose, soiled with drainage, causing a local reaction or there is evidence that the IV catheter is at risk for displacement. If the IV site is wrapped with an occlusive dressing, it must be removed to regularly examine the condition of the IV site and assess patency of the IV catheter.

5. IV tubing should be changed q 72 hours.

True

According to CDC guidelines IV tubing should be changed q 72 hours to reduce the risk of infection. Check agency policy regarding bag changes.

6. When a secondary set is used to administer an IV solution, the secondary set is positioned higher than the primary set.

True

Gravity will draw fluid from the container that is highest. Upon completion of the secondary set, fluid will be drawn from the primary intravenous solution that is hung lower than the secondary solution. It is imperative that the primary bag contain sufficient fluid to be administered upon completion of the secondary bag.

7. Albumin, a blood product needs to be typed and cross-matched to the client prior to administration.

False

Albumin is a small protein extracted from plasma and does not possess the antibodies that necessitate cross-matching.

Provide the best response for the following questions.

8. Clients who develop fluid overload with administration of IV fluids are described as having a positive fluid balance.
9. When the needle tip has penetrated the vessel wall and the IV solution leaks into the tissues, this is described as infiltration/interstitial.

10. When an IV is running by gravity and the rate fluctuates, identify the appropriate interventions to facilitate optimal flow.

1. *Ensure that there is sufficient fluid in the bag.*
2. *Ensure that the spike has fully penetrated the port in the IV solution bag.*
3. *Ensure the drip chamber is half full.*
4. *Ensure the fluid is not cold since this can cause vasospasm.*
5. *Ensure that the appropriate clamps are fully open and the roller clamp or manual volume controller pump is the only mechanism regulating the drop factor.*
6. *Check how client movement and position affect the flow rate.*
7. *Ensure the pole height is such that the bag is at least one meter higher than the IV site – raising and lowering the bed can inadvertently alter the distance factor.*
8. *Ensure the tubing is at or above the level of the IV site. Do not allow the tubing to fall below the IV site.*
9. *Assess the site for infiltration.*
10. *Assess the position of the bevel of the needle to ensure it is correctly in place and is secure.*
11. *Stabilize the site with a positioning device i.e. arm board, etc.*
12. *Assess site q 1h.*
13. *Ensure that only appropriately designated care providers are supporting the intravenous administration.*

11. Which of the following can occur as complications of IV therapy?

- Aspiration*
- Embolism*
- Infection*
- Phlebitis*
- Pulmonary edema*

12. For each of the complications selected above, provide an explanation as to how the complications might occur.

- Embolism: Embolism can be in the form of*
 - *a clot that has broken free from the site of thrombophlebitis,*
 - *air that has entered the line, or*
 - *precipitate or other particulate or foreign material that has entered the vascular system*

- ☑ *Infection: can be local or systemic. Once the skin's natural defense is broken with insertion of the IV needle, a portal of entry exists for organisms to enter the vascular system and result in an infection that may be limited to the IV site (local) or can manifest systemically (septicemia). Clients who are immunocompromised are at greater risk for infections.*

- ☑ *Phlebitis: is the inflammation of the vein in response to:*
 - *trauma and irritation of the vein by the catheter due to an incorrect size of needle (catheter) for the receiving vessel, improper insertion and/or weak anchoring resulting in movement of the catheter*
 - *chemical irritation from the IV solution/medication*
 - *infection from lack of vigilant aseptic technique*

- ☑ *Pulmonary edema: is a consequence of the cardiovascular and renal system's inability to handle an incremental increase in fluid volume. The increased blood volume raises the hydrostatic pressure that results in fluid moving into interstitial spaces which can manifest as pulmonary edema with the client experiencing shortness of breath, tachycardia, increased respiratory rate, increased jugular vein distention, and cough with expectoration of frothy white sputum.*

13. If there is evidence of a blood transfusion reaction, the initial response is to

- a. call the doctor
- b. contact the lab
- c. recheck the cross match data
- d. reduce the rate
- e. *stop the transfusion*

14. A blood transfusion is initiated at a slower rate to

- a. *assess client response*
- b. avoid chilling the client (inducing hypothermia)
- c. avoid overloading the vascular system
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- Intake and Output

15. Calculate the drop factor using a 10gtt/ml, 15gtt/ml and 60gtt/ml infusion set.

Step 1: Determine the number of milliliters per hour (volume) the IV is ordered to infuse.

$$\text{Formula: } \frac{\text{Total volume (TV)}}{\text{Total time (TT)}} = \text{Hourly Volume (mL/hr)}$$

$$\frac{3000 \text{ mls}}{24 \text{ hrs}} = 125 \text{ mls/hr}$$

Step 2: Calculate the drops per minute needed to infuse the ordered volume. Calibration is the drop factor/ml set by the manufacturer and is stated on the package of the administration set. Availability varies with agency resources.

$$\text{Formula: } \frac{\text{Hourly Volume} \times \text{Calibration}}{\text{Time (min)}} = \text{Flow rate (gtt/min)}$$

For **10 drop per ml** factor rate (calibration):

$$\frac{125 \text{ mls} \times 10 \text{ gtts/ml}}{60 \text{ min}} = 21 \text{ gtts/min}$$

For **15 drop per ml** factor rate (calibration):

$$\frac{125 \text{ mls} \times 15 \text{ gtts/ml}}{60 \text{ min}} = 31 \text{ gtts/min}$$

For **60 drop per ml** factor rate (calibration):

$$\frac{125 \text{ mls} \times 60 \text{ gtts/ml}}{60 \text{ min}} = 125 \text{ gtts/min}$$

Note that for a 60 gtt factor the flow rate is the same as the hourly rate.

16. Explain which calibration set would be used to administer Mr. Best's IV therapy.

Factors to consider in selecting the drop factor set include accurate and efficient delivery of the solution and set availability. In this situation a macrodrip set would be selected. If the 10 gtt/ml factor set was available it would be preferred. Monitoring 21 gtts/min/4 (# of 15 sec intervals in a minute) = 5 drops for every 15 seconds which is more manageable than the other sets.

Second, the 15 gtt/ml factor set would be used. The drop factor per 15 seconds would be 31 gtts/min/4 = 8 gtts per 15 second intervals.

17. The order states:

Give 3 liters of IV of 2/3 DW and 1/3 Saline with 20 mmols of KCl per liter per 24 hours.

What information will be on the label of the IV solution that matches the prescribed solution?

The label will state 3.3% Dextrose in Water 0.3% Sodium Chloride with 20 mmols KCl on a one liter bag.

18. What would the label state if only 500 ml bags are available?

For a 500 ml bag, the label will state 3.3% Dextrose in Water 0.3% Sodium Chloride with 10 mmols KCl. Notice the concentration of potassium in a 500 ml bag is one half of a 1000 ml (1 Liter) bag.

19. What information is required prior to starting this solution and why?

Information about the client's vital signs, electrolyte status, and renal function are required. By adding potassium to the IV, the client is at risk for hyperkalemia that could prove life threatening. The client must have adequate renal function (urinary output) to avoid potassium toxicity. Baseline data related to vital signs and electrolytes are necessary to assess and monitor the client's response to intravenous therapy.

20. Why is the client having potassium added to his IV?

Gastrointestinal fluids contain large quantities of potassium. Thus events that facilitate loss of GI fluids such as vomiting/diarrhea result in significant loss of potassium. Potassium replacement is required to maintain critical body functions i.e. musculoskeletal, cardiac, gastrointestinal, acid-base balance.

21. Despite the administration of several liters of fluid, Mr. Best's urinary output is low. The physician orders a 250 ml bolus of Normal Saline. What is this bolus and why is it ordered?

This bolus is a fluid challenge to assess renal function. The fluid is administered in a short span of time, usually one hour (the time must be prescribed) and the client's renal and cardiovascular status is carefully monitored during this period. The intended positive outcome is for urine output to significantly increase in response to the sudden increase in blood volume. The increase in output should be noted by the end of the bolus administration.

22. In the past 24 hours Mr. Best received the bolus of Normal Saline over one hour and subsequently the IV went interstitial. A time frame of 4 hours elapsed before the IV was restarted.

For the 24-hour period including these events, how much KCl did Mr. Best receive?

Number of hours of IV fluid: 24 hours minus 4 hours for interrupted period for the restart and 1 hour for the bolus indicates Mr. Best received 19 hours of a continuous IV solution with KCl. Determine the number of mmols per ml of fluid then multiply the number of mmols/ml times the hourly rate times the number of hours.

20 mmols of KCl in 1000mls = 20 mmols/1000 ml = 0.02 mmol per ml. If the hourly rate is 125 mls times 0.02 mmols/ml = 125 mls x 0.02 mmols/ml = 2.5 mmols of KCl per hour for 19 hours, therefore 2.5 mmols x 19 hrs = 47.5 mmols for the stated 24 hour period.

OR

Solve for X:

A: $1000 \text{ mls} = 20 \text{ mmols KCl}$
 $1 \text{ ml} = X$

$$X = \frac{20 \text{ mmols} \times 1 \text{ ml}}{1000 \text{ mls}} \qquad X = 0.02 \text{ mmols/ml}$$

B: $1 \text{ ml} = 0.02 \text{ mmols KCl/ml}$
 $125 \text{ mls} = X$

$$X = \frac{125 \text{ mls} \times 0.02 \text{ mmols KCl/ml}}{1 \text{ ml}} \qquad X = 2.5 \text{ mmols/hr}$$

C: $1 \text{ hr} = 2.5 \text{ mmols/hr}$
 $19 \text{ hrs} = X$

$$X = \frac{19 \text{ hrs} \times 2.5 \text{ mmols/hr}}{1 \text{ hr}} \qquad X = 47.5 \text{ mmols for the designated 24 hours}$$

OR

Client normally receives 60 mmols in 24 hours (amount prescribed in 3 liters) so solve for "X" using this information which would be:

$$\begin{array}{l} 60 \text{ mmols KCl} = 24 \text{ hours} \\ X = 19 \text{ hours} \end{array}$$

$$\frac{60 \text{ mmols KCl} \times 19 \text{ hours}}{24 \text{ hours}} = 47.5 \text{ mmols in the stated 24 hour period.}$$

23. How much IV fluid did Mr. Best receive in the same 24-hour period?

$$\begin{array}{l} 18 \text{ hours} \times 125 \text{ ml} = 2250 \text{ ml} \\ 1 \text{ hour} \times 250 \text{ ml} = \frac{250 \text{ ml}}{2500 \text{ ml}} \end{array}$$

24. Mr. Best's IV orders are changed to KVO. What is KVO and how is it determined?

KVO means keep vein open. This is usually about 25% of daily fluid requirements and is prescribed when clients require a decreased amount of fluid by IV route and/or the site needs to be preserved for reasons such as assessing the client's tolerance to oral fluids, or medication administration.

25. Mr. Best is now tolerating fluids and small portions of meals. The order is to convert the IV to a saline lock. What are possible reasons for this order?

Mr. Best's:

- a) hydration status is vulnerable and he may require re-establishment of IV fluid administration*
- b) inability to tolerate oral medications therefore they may be delivered via the intermittent infusion device*
- c) need for an intravenous access for other reasons such as diagnostic testing.*

26. A new order states: Administer 100 mls of Normal Saline in 30 minutes. Using a calibration set of 10 gtts/ml what will the drop rate be to administer the Normal Saline?

$$\frac{100 \text{ mls} \times 10 \text{ gtts/ml}}{30 \text{ min}} = 33 \text{ gtts/min}$$

27. What are the associated responsibilities of caring for an intermittent infusion device (saline/med lock) to ensure its patency?

1. *Check the site at regular intervals (as per agency policy) for redness, swelling, pain*
2. *Using a needleless device, flush with normal saline without preservatives q 8h (or as directed by agency policy). Withdraw while flushing with the final ml using positive pressure*
3. *Stabilize the cap when attaching and removing infusion device*
4. *Protect and stabilize the site as appropriate*

TAKING AND TRANSCRIBING PHYSICIAN'S ORDERS SELF-ASSESSMENT

Taking and transcribing physician's orders is only one component of safe medication administration. The exercises in Sections I, II, and III will assist the registrant to assess her/his abilities related to this component. Complete the exercises without the assistance of any resources i.e. independently – provide your best response. Verify responses with the keys that are provided for each section. Responses may vary slightly in accordance with adherence to employing agency policies and protocols. The stated responses are guided by the principles of safe medication administration referenced in common resources addressing Pharmacology for Nurses.

Difficulty completing the exercises independently is an indication to consider enrolling in a relevant upgrading course, even if the course was completed within the past five years. Refer to the [Pharmacology Upgrading Course Resource](#).

SECTION I – IDENTIFYING ERRORS

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

1. Furosemide 20 mg po od odd days.
2. Cipro 500 mg po q6h.
3. Tobramycin 2 gtts tid a.s. for left eye drainage.
4. Digoxin .25 mg od.
5. Nitro-Dur 0.4 mg/hr od.
6. NitroSpray 0.4 mg for angina prn
7. Iron supps daily
8. Ativan 2.0 mg po for anxiety
9. Prednisone ½ tab daily
10. AZT 100 mg po od

Complete the table below. Medication errors can occur for a variety of reasons. Some of the types of errors are listed below. Provide an example of how such errors could occur.

Type of Error	Example
· Prescription error	·
· Transcription error	·
· Dispensing error	·
· Administration error	·
· Monitoring error	·
· Documentation error	·

TAKING AND TRANSCRIBING PHYSICIAN'S ORDERS
SELF-ASSESSMENT - KEY

SECTION I: IDENTIFYING ERRORS

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

1. Furosemide 20 mg po od odd days.

Order should be clarified. 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.

2. Cipro 500 mg po q6h.

Full name of the drug should be written out (Ciprofloxacin). Dose exceeds usual range of 0.5 gm – 1.5 gm per day in two divided doses.

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

Order should include strength of Tobramycin and number of days of administration prior to reassessment. Med 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.

4. Digoxin .25 mg od.

Leading zeros (0) should always appear in numbers less than 1 i.e. 0.25 is required to avoid an error in dose strength. Further, for digoxin (lanoxin) a conditional statement is required i.e. when the medication should be withheld i.e. apical pulse < 55.

5. Nitro-Dur 0.4 mg/hr od.

Order should indicate whether the transdermal patch is to be removed after a set number of hours or left in place for the entire 24 hours.

6. NitroSpray 0.4 mg for angina prn

Order needs to indicate number of metered dose sprays and the maximum number of permissible sprays per dose to achieve effectiveness. If chest pain is not relieved with a maximum of 3 doses of 1-2 sprays per dose within 15 minutes the physician should be contacted immediately. Each 2-spray dose should have a minimum 5-minute interval between each administration.

7. Iron supps daily

Order needs 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.

8. Ativan 2.0 mg po for anxiety

A trailing zero after a decimal point should not be used since overlooking the decimal point could result in a tenfold error in administration i.e. 20 mg instead of 2 mg. Directions need to include the frequency of the medication i.e. on a regular schedule, prn basis with a possible repeat.

9. Prednisone ½ tab daily

The dosage strength should be written out since medications frequently come in a variety of strengths. Prednisone that is available in 5 mg and 50 mg strengths.

10. AZT 100 mg po od

Abbreviations for names should be avoided since in this case AZT could refer to any of azathioprine, zidovudine, or aztreonam. Writing the generic and trade name are helpful if there is a risk of misinterpretation.

Summary:

All orders must be accompanied with:

- the date and time the order was written or taken*
- a clearly visible notation about client allergies*
- legible signature of the prescribing physician at the time the orders are written. In the situation of telephone/verbal orders the physician is expected to sign orders, ideally within 24-hours of giving the orders or the physician's next visit (refer to agency policy). If a telephone or verbal order was received it must include the receiving nurse's legible signature and professional designation.*
- documentation in the nurse's notes whenever telephone/verbal orders are required.*

Complete the table below. Medication errors can occur for a variety of reasons. Some of the types of errors are listed below. Provide an example of how such errors could occur.

Type of Error	Example
<ul style="list-style-type: none"> · Prescription error 	<ul style="list-style-type: none"> · <i>Prescription for a client with a known allergy or intolerance</i> · <i>Wrong dose for the type of condition i.e. under dosing or over dosing</i>
<ul style="list-style-type: none"> · Transcription error 	<ul style="list-style-type: none"> · <i>Use of unapproved abbreviations</i> · <i>Illegible writing/documentation</i> · <i>Misunderstanding of intended order</i> · <i>Omission of orders</i>
<ul style="list-style-type: none"> · Dispensing error 	<ul style="list-style-type: none"> · <i>Incorrect drug/dose sent to unit</i> · <i>Incorrect labeling of package from dispensary</i> · <i>Incorrect formulation or dosage form</i>
<ul style="list-style-type: none"> · Administration error 	<ul style="list-style-type: none"> · <i>Wrong dose/strength administered</i> · <i>Incorrect calculation</i> · <i>Additional dose given or dose missed</i> · <i>Incorrect administration time</i> · <i>Incorrect administration technique and or route of prescribed administration</i> · <i>Misidentification of client</i> · <i>Unauthorized substitution of medications</i>
<ul style="list-style-type: none"> · Monitoring error 	<ul style="list-style-type: none"> · <i>Inadequate monitoring, documentation and reporting of client response to medication</i> · <i>Ineffective or lack of client education</i>
<ul style="list-style-type: none"> · Documentation error 	<ul style="list-style-type: none"> · <i>Premature or delayed documentation of medication administration</i> · <i>Documentation in incorrect record</i>

It is vital that the nurse be aware of personal knowledge deficits and set to correct the deficits immediately. Licensed Practical Nurses in British Columbia are obliged to practice in accordance with their Professional Standards of Practice and Code of Ethics, which include the “rights of medication administration”.

In the event that the order is open to interpretation or just “doesn’t seem right”, clarification must be obtained from the originator of the order and/or from an expert.

Nurses responsible for administering medications must have access to and know how and where to obtain necessary information for safe medication administration.

TAKING AND TRANSCRIBING PHYSICIAN'S ORDERS
SELF-ASSESSMENT

SECTION II: WRITING ORDERS

Write out the following telephone orders received from a physician. Use standard commonly used medical abbreviations. A blank Physician's Order sheet follows for documentation. After writing out the orders, identify the related responsibilities in processing (transcribing) the orders.

1. Eight units of regular insulin and sixteen units of intermediate insulin subcutaneously each day before breakfast.
2. One drop in each eye of betaxolol half percent solution twice a day.
3. Morphine one to two milligrams subcutaneously at one-hour intervals as needed for pain by an intermittent device.
4. Phenytoin suspension three hundred milligrams once a day by gastric feeding tube. Stop feeds an hour before and after the medication.
5. Vitamin B twelve, one hundred micrograms intramuscularly once a month.
6. Potassium chloride 20 millimols elixir orally once a day.
7. Levothyroxine seventy-five micrograms by mouth once a day.
8. Dimenhydrinate fifty to seventy-five milligrams intramuscularly every four hours for nausea as required. Do not exceed four hundred milligrams in a twenty-four hour period.
9. Ampicillin two hundred and fifty milligrams by mouth every six hours for ten days.
10. Apply Nitropatch point one milligram per hour daily. Change daily.



NORTHWEST HEALTH
REGION

KEY

ADDRESSOGRAPH

**PHYSICIAN'S ORDERS
RESIDENTIAL CARE**

KEY FOR TAKING AND TRANSCRIBING
TELEPHONE OR VERBAL ORDERS

MUST BE FILLED IN ON THE FIRST PAGE OF THE CHART:

DIAGNOSIS: _____

ALLERGIES: NKA , _____

- Document respective diagnosis
- Note allergies for each client

DATE & TIME		ACTION TAKEN
	1. Eight units of regular insulin and sixteen units of intermediate insulin subcutaneously each day before breakfast.	
	<i>Insulin 8 Units R and 16 Units N sc ac breakfast</i>	
	2. One drop in each eye of betaxolol half percent solution twice a day.	
	<i>Betaxolol 0.5% sol'n gtt i ou bid</i>	
	3. Morphine one to two milligrams subcutaneously at one-hour intervals as needed for pain by an intermittent device.	
	<i>Morphine 1-2 mg sc q1h prn for pain via intermittent sc device</i>	
	4. Phenytoin suspension three hundred milligrams once a day by gastric feeding tube. Stop feeds an hour before and after the medication.	
	<i>Phenytoin 300 mg susp od via G-tube. Hold feeds 1 hr pre and post dose</i>	
	5. Vitamin B twelve, one hundred micrograms intramuscularly once a month.	
	<i>Vitamin B₁₂ 100 mcg(µg) IM q month</i>	
	6. Potassium chloride 20 millimols elixir orally once a day.	
	<i>KCL 20 mmol(mM) elixir po od</i>	
	7. Levothyroxine seventy-five micrograms by mouth once a day	
	<i>Levothyroxine 75 mcg po od</i>	
	8. Dimenhydrinate fifty to seventy-five milligrams intramuscularly every four hours for nausea as required. Do not exceed four hundred milligrams in a twenty-four hour period.	
	<i>Dimenhydrinate 50-75 mg IM q4h prn for nausea. Not to exceed 400 mg/24hrs</i>	
	9. Ampicillin two hundred and fifty milligrams by mouth every six hours for ten days.	
	<i>Ampicillin 250 mg po q6h x 10 days</i>	
	10. Nitropatch point one milligram per hour daily. Change once a day.	
	<i>Nitropatch 0.1 mg/hr od. Change q 24h</i>	
	T.O. Dr. H. Promo taken by Thelma Louis LPN, July 1, 2004	

Date and time for each order must be stated

TO PROCESS ORDERS: make notations in action column, secure ideally within 24 hrs of telephone/verbal order or next visit, do nurse's notes the reason for telephone order, clarify any ambiguous respective agency policies & protocols i.e. faxing to pharmacy, notations, MAR documentation, flag chart alerting for checks & etc

**PHYSICIAN'S ORDERS
RESIDENTIAL CARE**

SMITH, JAMES NEIL DOB 11/11/11
 #2345678 ADM 04JUN99
 Dr. W. Majic 93 M
 AB0003456 PHN 90909090

 Room 115A

MUST BE FILLED IN ON THE FIRST PAGE OF THE CHART:

DIAGNOSIS: _____ CVA, CHF, DIABETES _____

ALLERGIES: NKA , _____ CODEINE _____

DATE & TIME		ACTION TAKEN
June 7.04 [time is missing]	Coumadin 2 mg od [Additional information required: - route - instructions for weekly INR - instruct to call MD with weekly INR results]	
	Tylenol #3 i - ii tabs q 4 - 6 h prn [Note that client has a codeine allergy - Tylenol #3 contains 30 mg of codeine]	
	Colace 100 mg po bid	
	Polysporin ung tid [Required: - site of application - length of time of application - followed by re-assessment]	
	Furosemide 20 mg po od	
	Metformin with meals [- dose required]	
	Dr. W Majic	
	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> Deficits/actions required noted in brackets [] </div>	
		p. 2/6

MAR - KEY

CLIENT: SMITH, JAMES

MEDICATION ADMINISTRATION RECORD

EFFECTIVE DATES: JUNE 1 – 30, 2004

ROOM/BED: 115 A

ALLERGIES: CODEINE

DAYS OF THE MONTH

MEDICATIONS AND DIRECTIONS	TIMES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Coumadin 2 mg po od* (Call MD w. INR q Tues)	1700																																
Colace 100 mg po bid	0900																																
	1700																																
Polysporin ung to Lt. great toe –cover with drsg – tid - 10 days then reassess	0900																																
	1400																																
	2100																			LD													
Furosemide 20 mg po od	0900																																
Metformin 1000 mg po ac brkfst and dinner	0900																																
	1700																																
Metformin 500 mg po ac lunch	1200																																
Tylenol ES i – ii tabs po q4h prn																																	

CLIENT: SMITH, JAMES

ROOM/BED: 115 A

- Orders processed at 1330. Start times reflect time of processing and allowing time for drug availability (delivery)
- Lines drawn through dates/times corresponding to start or stop dates and times
- *Some facilities have an anticoagulant record for documentation of drug and INR results
- LD – last dose

MAR CHECKED BY: _____

Pharmacology Upgrading Course Resource

<ul style="list-style-type: none"> • Education Institution • Contact 	<ul style="list-style-type: none"> • Course Name & No. • Length • Credit Value • Objectives/Curriculum 	<ul style="list-style-type: none"> • Availability • Approximate Cost 	<ul style="list-style-type: none"> • Prerequisites 	<ul style="list-style-type: none"> • Format 	<ul style="list-style-type: none"> • Evaluation System
<p>BC Open University (formerly OLA) 4355 Mathissi Place Burnaby BC V5G 4S8</p> <p>www.bcou.ca</p> <p>604.431.3000 (T) 604.431.3387 (F)</p> <p><u>CONTACT</u> Lori Miller Coordinator PN Program Refresher</p> <p>604.431.3000 x 3465</p> <p>lmiller@bcou.ca</p>	<ul style="list-style-type: none"> • Pharmacology for Practical Nurses • PNRP 280 • 2 Credit • Complete clinical and theory within 30 weeks of registration – extension available on request <p><u>Objectives:</u></p> <ul style="list-style-type: none"> • Apply the basic concepts of pharmacology to a range of commonly used medications • Explain how to administer meds in legal, accurate, responsible, systematic ways • Apply knowledge to basic pharmacology and safe administration of meds to the older adult • Demonstrate the ability to administer meds safely using enteral, percutaneous, and parenteral (SC/IM) routes • Administer a range of meds in a safe and knowledgeable way to a variety of clients <p><i>NB: At this time this course does not include supporting IV therapy and taking and transcribing of MD orders. The course is undergoing revision and the revised format will include these topics (tentative implementation date Feb 2005)</i></p>	<ul style="list-style-type: none"> • Continuous intake • \$467.00 	<ul style="list-style-type: none"> • Admission Approval required: • Contact Student Services for the Pharmacology Admission Application Package • If license has lapsed, contact CLPNBC - assess & recommend need for upgrade 	<ul style="list-style-type: none"> • Distance • Self-paced • Print format • Tutor assistance available by phone, mail and e-Mail • - 4 Learning Activities followed by • - a one week full time regionally based preceptorship 	<ul style="list-style-type: none"> • 4 Assignments • 1 Final exam • Successful preceptorship
<p>BC Open University (formerly OLA) 4355 Mathissi Place Burnaby BC V5G 4S8</p> <p>www.bcou.ca</p> <p>604.431.3000 (T) 604.431.3387 (F)</p> <p><u>CONTACT</u> Reta McKay Program Coordinator for Practical Nurse Access Program</p> <p>604.431.3000 x 3318</p> <p>retam@bcou.ca</p>	<ul style="list-style-type: none"> • Pre-Nursing Mathematics • PNAP 100 • No credit value <p><u>Objectives:</u></p> <ul style="list-style-type: none"> • Ability to multiply and divide • Ability to manipulate fractions, decimals and percents • Understanding of the base-ten place value system • Understanding of the metric measurements system • Understanding of the concept of ratios • Application of this knowledge and skill to example from nursing practice • 6 weeks part time 	<ul style="list-style-type: none"> • Continuous intake • Refer to website, www.bcou.ca for cost 	<ul style="list-style-type: none"> • No pre-requisite • PNAP 100 – pre-Nursing mathematics course available for those interested or needing a refresher & / or remediation in mathematics 	<ul style="list-style-type: none"> • Distance • 6 weeks part-time 	<ul style="list-style-type: none"> • Pass 90%

NB: Information presented in this overview is drawn from the respective educational institution’s publications and is subject to change. CLPNBC is not responsible for the accuracy and/or currency of the information. Registrants are advised to validate relevant information with the respective identified contacts.

<ul style="list-style-type: none"> • Education Institution • Contact 	<ul style="list-style-type: none"> • Course Name & No. • Length • Credit Value • Objectives/Curriculum 	<ul style="list-style-type: none"> • Availability • Approximate Cost 	<ul style="list-style-type: none"> • Prerequisites 	<ul style="list-style-type: none"> • Format 	<ul style="list-style-type: none"> • Evaluation System
<p>Camosun College 3100 Foul Bay Rd Victoria, BC V8P 4X8</p> <p>250.370.3236 (CE)</p> <p>http://www.camosun.bc.ca</p> <p><u>CONTACT</u> Sharon Dixon Chair, Continuing Care Programs, School of Health & Human Services dixon@camosun.bc.ca 250.370.3240</p> <p>Program Assistant Angela Dawson 250.370.3236</p> <p>Can register by phone 250.370.3550</p>	<ul style="list-style-type: none"> • Supporting Intravenous Therapy and Blood Product Administration • 2 day course 	<ul style="list-style-type: none"> • Dec 4/5, Jan 21/22, (classes filled) next available date: Feb 11/12 • Enrollment max 24 students • Cost: \$180.00 • Modules extra (\$20.00) 	<ul style="list-style-type: none"> • Current LPN licensure – show to instructor. • Pre reading of assigned modules prior to workshop 	<ul style="list-style-type: none"> • On site • On campus workshop – lab component • Pre-reading of assigned modules • No textbook required 	<ul style="list-style-type: none"> • Skills check
	<ul style="list-style-type: none"> • Taking and Transcribing MD Orders • 1 day course 	<ul style="list-style-type: none"> • Nov 13, Dec 3, Jan 29, Feb 26 (classes filled) • Check with Angela re future dates • Enrollment max 36 students • Cost: \$100.00 	<ul style="list-style-type: none"> • Current PN licensure – show to instructor. • Pre reading of materials prior to workshop 	<ul style="list-style-type: none"> • On site • On campus workshop 	

<ul style="list-style-type: none"> • Education Institution • Contact 	<ul style="list-style-type: none"> • Course Name & No. • Length • Credit Value • Objectives/Curriculum 	<ul style="list-style-type: none"> • Availability • Approximate Cost 	<ul style="list-style-type: none"> • Prerequisites 	<ul style="list-style-type: none"> • Format 	<ul style="list-style-type: none"> • Evaluation System
<p>College of the Rockies PO Box 8500 2700 College Way Cranbrook, BC VIC 5L7</p> <p>1.877.489.2687 Toll Free 250.489.2751 x 370 250.489.1790 (F)</p> <p>www.cotr.bc.ca</p> <p><u>CONTACT</u> Sandi Hendrickson Coordinator Health Programs 250.489.2751 x 370 hendrickson@cotr.bc.ca</p>	<ul style="list-style-type: none"> • Basic Pharmacology • PVHE 616 <p>Part 1 of 2</p> <ul style="list-style-type: none"> • Introduction to basic pharmacology. Principles & safe use of drugs with clients across the life span with physical/mental challenges. Clients reside in community, continuing care or acute care facilities. <p><u>Learning Outcomes:</u></p> <ul style="list-style-type: none"> • Refer to website Course Outline PVHE 616 College of Rockies www.cotr.bc.ca • Complete within 4 months of January or September registration date. 	<ul style="list-style-type: none"> • January and September intake • Cost: refer to www.cotr.bc.ca/registration - Fees and Refunds Nov 2004 – \$300.00 	<ul style="list-style-type: none"> • Current PN license <u>or</u> • letter of eligibility from CLPNBC <u>or</u> • discretion of the instructor. • Relevant documents to be submitted with application form for course admission. 	<ul style="list-style-type: none"> • Distance • 45 hour self-paced format by distance • Weekly tutor contact by telephone or email 	<ul style="list-style-type: none"> • Module Learning Activities – 40% • Written assignment – 40% • Final quiz – 20% • Overall pass 80%
<p>Comments:</p> <p><u>1. Resources for PHVE 616 and 617:</u></p> <ul style="list-style-type: none"> • Any Drug Guide less than 3 years old • Basic Nursing Pharmacology Text less than 3 years old <p><u>2. PLA</u> available for course credit.</p> <p>It may include:</p> <ol style="list-style-type: none"> 1. Interview re professional experience with medication administration 2. Evidence of prior training with pharmacology 3. Letter of recommendation from supervisors documenting learning ability to meet course outcomes <ul style="list-style-type: none"> • Cost: \$300.00 					

<ul style="list-style-type: none"> • Education Institution • Contact 	<ul style="list-style-type: none"> • Course Name & No. • Length • Credit Value • Objectives/Curriculum 	<ul style="list-style-type: none"> • Availability • Approximate Cost 	<ul style="list-style-type: none"> • Prerequisites 	<ul style="list-style-type: none"> • Format 	<ul style="list-style-type: none"> • Evaluation System
<p>College of the Rockies PO Box 8500 2700 College Way Cranbrook, BC VIC 5L7</p> <p>1.877.489.2687 Toll Free 250.489.2751 x 370 250.489.1790 (F)</p> <p>www.cotr.bc.ca</p> <p><u>CONTACT</u> Sandi Hendrickson Coordinator Health Programs 250.489.2751 x 370 hendrickson@cotr.bc.ca</p>	<ul style="list-style-type: none"> • Gero-Pharmacology • PVHE 617 • Part 2 of 2 • Introduction to safe use of drugs with the older adult in a variety of settings with physical &/or mental disabilities & who require medication • Includes 15 hour practicum • Complete 4 months from registration date in January or September <p><i>NB: At this time this course (PVHE 616 & 617) does not include supporting IV therapy and taking and transcribing of MD orders. Proposed inclusion for these topics is tentatively set for Jan 2005)</i></p>	<ul style="list-style-type: none"> • January / September intakes • Cost: refer to www.cotr.bc.ca/registration - Fees and Refunds Nov 2004: \$300.00 	<ul style="list-style-type: none"> • PVHE 616 or equivalent 	<ul style="list-style-type: none"> • Distance • 45 hour self-paced format by distance • 15 hr supervised practicum with RN or LPN administering medications of oral and parenteral to a variety of clients 	<ul style="list-style-type: none"> • Module Learning Activities – 40% • Written assignment – 40% • Final quiz – 20% • Overall pass - 80%
	<ul style="list-style-type: none"> • Subcutaneous & IM Injections & the use of Narcotic Medications • PVHE 550 • Complete 4 months from registration date in January or September <p><i>NB: Information about - SC/IM Narcotics and Taking and Transcribing MD Orders is currently not available on the website. For additional information directly contact Sandi Hendrickson</i></p>	<ul style="list-style-type: none"> • January / September intakes • Cost: refer to www.cotr.bc.ca/registration - Fees and Refunds Nov 2004: \$150.00 	<ul style="list-style-type: none"> • Proof of LPN licensure 	<ul style="list-style-type: none"> • Distance • 25 hour self-paced format • <u>Plus</u> 7 hr supervised practicum with RN or LPN administering medications of oral and parenteral to a variety of clients 	<ul style="list-style-type: none"> • Learning Activities – 60% • Final quiz – 40% • Overall pass 65% • Practicum: Pass/Fail
	<ul style="list-style-type: none"> • Taking and Transcribing Verbal and Telephone Physician's Orders • PVHE 552 • Complete 4 months from registration date in January or September 	<ul style="list-style-type: none"> • January / September intakes • Cost: refer to www.cotr.bc.ca/registration - Fees and Refunds Nov 2004: \$150.00 	<ul style="list-style-type: none"> • Proof of LPN licensure 	<ul style="list-style-type: none"> • Distance • 25 hour self-paced format • No practicum 	<ul style="list-style-type: none"> • Learning Activities – 40% • Written assignment – 40% • Final quiz – 20% • Overall pass 65%

<ul style="list-style-type: none"> • Education Institution • Contact 	<ul style="list-style-type: none"> • Course Name & No. • Length • Credit Value • Objectives/Curriculum 	<ul style="list-style-type: none"> • Availability • Approximate Cost 	<ul style="list-style-type: none"> • Prerequisites 	<ul style="list-style-type: none"> • Format 	<ul style="list-style-type: none"> • Evaluation System
<p>Vancouver Community College</p> <p>250 W Pender St Vancouver, BC V6B 1S9</p> <p>604.443.8300 (T)</p> <p>www.vcc.ca</p> <p><u>CONTACT</u> Continuing Education (CE) Leslie Stuart 604.443.8673</p> <p>Shirley Clarke 604.443.8674</p>	<p>A: • Pharmacology Theory for LPNs • HLTH 1128</p> <p>Part I: Theory Component</p> <p>Core Course:</p> <ul style="list-style-type: none"> • Part I (A, B, & C) - Theory • Part II – Practicum. <ul style="list-style-type: none"> • Recommend completion in 3 - 6 mos. Maximum: 12 mos. • Oral, SC and IM medication administration 	<ul style="list-style-type: none"> • Continuous intake • \$650.00 (includes modules) • Textbooks are an additional cost • Fees include: HLTH 1128, 1269 & 1130 • Max: 10 students 	<ul style="list-style-type: none"> • Currently licensed Practical Nurse. Copy of license must be submitted with the application form. 	<ul style="list-style-type: none"> • Distance <ul style="list-style-type: none"> - Print or - Online (BCCAMPUS.CA offering) • Followed by HLTH 1169 – 5 hour evening tutorial <u>Tutorial:</u> Optional but highly recommended offered the second Thursday of q. mo. except following a statutory holiday • Bring modules and lab supplies 	<ul style="list-style-type: none"> • Midterm exam: Used as a self-assessment diagnostic tool. For each the mathematics & theory component a pass is 80% for each section. • Final exam: mathematics & theory component. • Pass: 80% for each section.
	<p><u>Part I: cont'd</u></p> <p>B: • Tutorial for Pharmacology Theory LPNs • HLTH 1269</p> <ul style="list-style-type: none"> • This session offered for participants of the Pharmacology course and Pharmacology Review course. • 5 hours for 6 evenings <p>Maximum enrollment: 10</p>	<ul style="list-style-type: none"> • Cost included in fees for HLTH 1128 • Offered second Thursday evening of q. month except when this date is a statutory holiday 	<ul style="list-style-type: none"> • All course work must be completed prior to registering for this tutorial. 	<ul style="list-style-type: none"> • Bring modules and lab supplies 	
	<p><u>Part I: cont'd</u></p> <p>C: • Workshop and Skills Check for Pharmacology Students • HLTH 1130</p> <ul style="list-style-type: none"> • Follows HLTH 1128 & 1269 • 8 hour workshop 	<ul style="list-style-type: none"> • Cost included in fees for HLTH 1128 • Offered last Saturday of each month – 8 hrs 	<ul style="list-style-type: none"> • Skills check out following completion of HLTH 1128 & 1269 	<ul style="list-style-type: none"> • Skills check 	<ul style="list-style-type: none"> • Skills check

<ul style="list-style-type: none"> • Education Institution • Contact 	<ul style="list-style-type: none"> • Course Name & No. • Length • Credit Value • Objectives/Curriculum 	<ul style="list-style-type: none"> • Availability • Approximate Cost 	<ul style="list-style-type: none"> • Prerequisites 	<ul style="list-style-type: none"> • Format 	<ul style="list-style-type: none"> • Evaluation System
<p>Comments:</p> <p>1. Required Resources for HLTH 1128, 1269 & 1130:</p> <ul style="list-style-type: none"> • <i>Basic Pharmacology for Nurses</i> by Clayton and Stock • Plus a Drug Guide such as <i>Davis's Drug Guide for Nurses</i> and medication cards are recommended <p>2. Recommended Optional Resources:</p> <ul style="list-style-type: none"> • <i>Math for Meds</i> by Curren & Munday • Budget for approximately \$250.00 for resources 					
<p>Vancouver Community College</p> <p>250 W Pender St Vancouver, BC V6B 1S9</p> <p>604.443.8300 (T)</p> <p>www.vcc.ca</p> <p><u>CONTACT</u> Continuing Education (CE) Leslie Stuart 604.443.8673</p> <p>Shirley Clarke 604.443.8674</p>	<p><u>Optional:</u></p> <ul style="list-style-type: none"> • Pharmacology Theory in Class Presentation • HLTH 1308 • 5 week tutorial • <i>Adjunct</i> to HLTH 1128. 	<ul style="list-style-type: none"> • \$350.00 • Check VCC CE website www.vcc.ca for dates • Minimum enrollment 10 students 	<ul style="list-style-type: none"> • Currently licensed Practical Nurse. Copy of license must be submitted with the application form. 	<ul style="list-style-type: none"> • 5 wk tutorial to guide distance format learning. • Students enrolled in this course receive a reduction in HLTH 1128 tuition fees. 	
	<p>Part II:</p> <ul style="list-style-type: none"> • Pharmacology Clinical Practicum • HLTH 1131 • Practice Component • Scheduled after successful completion of theory - a practicum experience is required including a skills check • 3 consecutive 7.5 hour days scheduled in a facility other than student's employing agency 	<ul style="list-style-type: none"> • \$150.00 plus additional \$150.00 cost if a clinical instructor required • Call to register 	<ul style="list-style-type: none"> • Currently licensed Practical Nurse. Copy of license must be submitted with the application form. 	<ul style="list-style-type: none"> • Clinical practicum – 3 x 7.5 hrs to take place in a clinical setting other than LPN's regular workplace 	<ul style="list-style-type: none"> • Compulsory skills check after theory component is completed

<ul style="list-style-type: none"> • Education Institution • Contact 	<ul style="list-style-type: none"> • Course Name & No. • Length • Credit Value • Objectives/Curriculum 	<ul style="list-style-type: none"> • Availability • Approximate Cost 	<ul style="list-style-type: none"> • Prerequisites 	<ul style="list-style-type: none"> • Format 	<ul style="list-style-type: none"> • Evaluation System
<p>Vancouver Community College</p> <p>250 W Pender St Vancouver, BC V6B 1S9</p> <p>604.443.8300 (T)</p> <p>www.vcc.ca</p> <p><u>CONTACT</u> Continuing Education (CE) Leslie Stuart 604.443.8673</p> <p>Shirley Clarke 604.443.8674</p>	<p><i>Individual units: I, II, or III</i></p> <p>I: • Subcutaneous Injection Theory • HLTH 1266</p> <ul style="list-style-type: none"> • Theory includes diabetes management w. insulin, sc heparin, sc butterfly insertion and use for pain management • Completion within 3 - 6 months of registration. Completion of HLTH 1266 is followed by HLTH 1267 	<ul style="list-style-type: none"> • Continuous intake • Cost includes skills check workshop: \$150.00 	<ul style="list-style-type: none"> • Current PN license • Successful completion of recognized pharmacology course 	<ul style="list-style-type: none"> • Distance • Followed by one day workshop and skills check (HLTH 1267) 	<ul style="list-style-type: none"> • Final exam. Pass 80% • Skills check at the end of the workshop
	<ul style="list-style-type: none"> • Workshop and Skills Check for Subcutaneous Injection • HLTH 1267 • Workshop & skills check 	<ul style="list-style-type: none"> • Workshop & skills check held second Saturday of q. mo. 	<ul style="list-style-type: none"> • Register for HLTH 1267 after successful completion of HLTH 1266 final exam 	<ul style="list-style-type: none"> • Final exam for HLTH 1266 must be completed prior to workshop 	<ul style="list-style-type: none"> • Skills check
	<p>II: • IM injections for the LPN • HLTH 1122</p> <ul style="list-style-type: none"> • Theory and clinical skills for safe administration of IMs • Completion within 3 - 6 mos. followed by HLTH 1139 	<ul style="list-style-type: none"> • Continuous intake • Cost includes skills check workshop: 	<ul style="list-style-type: none"> • Current PN license • Successful completion of a recognized pharmacology course 	<ul style="list-style-type: none"> • Distance • Followed by one day workshop and skills check (HLTH 1139) 	<ul style="list-style-type: none"> • Final exam. Pass 80% • Skills check at the end of the workshop
	<ul style="list-style-type: none"> • IM Injection Skill Lab • HLTH 1139 • IM workshop & skills check 	<ul style="list-style-type: none"> • Workshop & skills check held second Saturday of every month except Oct. 	<ul style="list-style-type: none"> • Register for HLTH 1139 after successful completion of HLTH 1122 final exam 	<ul style="list-style-type: none"> • Final exam for HLTH 1122 must be completed prior to skills workshop 	<ul style="list-style-type: none"> • Skills check

<ul style="list-style-type: none"> • Education Institution • Contact 	<ul style="list-style-type: none"> • Course Name & No. • Length • Credit Value • Objectives/Curriculum 	<ul style="list-style-type: none"> • Availability • Approximate Cost 	<ul style="list-style-type: none"> • Prerequisites 	<ul style="list-style-type: none"> • Format 	<ul style="list-style-type: none"> • Evaluation System 	
<p>Vancouver Community College</p> <p>250 W Pender St Vancouver, BC V6B 1S9</p> <p>604.443.8300 (T)</p> <p>www.vcc.ca</p> <p><u>CONTACT</u> Continuing Education (CE) Leslie Stuart 604.443.8673</p> <p>Shirley Clarke 604.443.8674</p>	<p>III. • Parenteral Injections: Combines Intramuscular & Subcutaneous Injections</p> <ul style="list-style-type: none"> • HLTH 1292 	<ul style="list-style-type: none"> • Offered with sufficient enrollment. • Call to register • Cost: \$250.00 	<ul style="list-style-type: none"> • LPN license • Successful completion of recognized pharmacology course that did not include SC & IM injections 	<ul style="list-style-type: none"> • Distance • Followed by one day workshop and skills check • Final exam for HLTH 1292 must be completed prior to skills workshop 	<ul style="list-style-type: none"> • Final exam. Pass 80% • Skills check at the end of the workshop 	
	<ul style="list-style-type: none"> • Pharmacology Review • HLTH 1295 <p>Review of math calculations and skills associated with all routes of med administration. PO, SL, SC, IM, & topical</p>	<ul style="list-style-type: none"> • Cost: \$250.00 • One evening and one day session. • Call VCC CE or check website www.vcc.ca for dates 	<ul style="list-style-type: none"> • Current PN license • Completion of a pharmacology course within past 3 years 	<ul style="list-style-type: none"> • Distance module component 		
	<p>Comments: Pharmacology Review (HLTH 1295) is a course recommended for LPNs needing a refresher or serves registrant to self-assess the need to take the complete core (basic-gero pharmacology) course</p>					
	<ul style="list-style-type: none"> • IV Therapy Presentation for LPNs • HLTH 1272 <p>• Calculation of IV rates by gravity, adding IV solutions to an existing line, flushing & discontinuing a saline lock, blood administration, hypodermoclysis & management of IV sites and complications</p>	<ul style="list-style-type: none"> • Cost: \$150.00 • One day • Call VCC CE or check website www.vcc.ca for dates 	<ul style="list-style-type: none"> • Current LPN license • Successful completion of recognized pharmacology course that did not include supporting IV therapy and administration of blood products 	<ul style="list-style-type: none"> • Distance module component followed by skills check 	<ul style="list-style-type: none"> • Final exam. Pass 80% • Skills check at the end of the theory 	
<ul style="list-style-type: none"> • Taking and Transcribing Physician's Orders • HLTH 1138 <p>• Skills to competently receive and transcribe MD verbal and telephone orders</p> <p>• Completion within 3 - 6 mos.</p>	<ul style="list-style-type: none"> • Continuous intake OR • One day workshop • Cost: \$150.00 	<ul style="list-style-type: none"> • Current LPN license • Successful completion of recognized pharmacology course that did not include taking and transcribing MD orders. 	<ul style="list-style-type: none"> • Self-paced distance module • One day workshop option 	<ul style="list-style-type: none"> • Final exam. Pass 80% • Skills check at the end of the workshop 		

<ul style="list-style-type: none"> • Education Institution • Contact 	<ul style="list-style-type: none"> • Course Name & No. • Length • Credit Value • Objectives/Curriculum 	<ul style="list-style-type: none"> • Availability • Approximate Cost 	<ul style="list-style-type: none"> • Prerequisites 	<ul style="list-style-type: none"> • Format 	<ul style="list-style-type: none"> • Evaluation System
<p>Vancouver Community College</p> <p>250 W Pender St Vancouver, BC V6B 1S9 604.443.8300 (T)</p> <p>www.vcc.ca</p>	<p>Mathematics for Health Sciences - Pre-Nursing Mathematics</p> <ul style="list-style-type: none"> • MATH 1054 • A non-credit course for health sciences students • Go to the website www.vcc.ca for more details (Program: Access to Careers and Education, Academic Upgrading, Self – Paced) 	<ul style="list-style-type: none"> • Continuous intake for self-paced • Check with the Program for class room based dates • \$68.75 – 275.00 per month plus student fees 	<ul style="list-style-type: none"> • Prerequisite: Math 10 or equivalent 	<ul style="list-style-type: none"> • Distance - self-paced <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> • A structured, eight-week intensive on site course 	

Summary of VCC Continuing Education LPN Pharmacology offerings (www.vcc.ca)

	Topics	Course Name	Course Number	Cost
1.	Core Course Theory, skills check & practicum	Pharmacology Theory for LPNs	HLTH 1128	650.00
2.		Tutorial for Pharmacology Theory LPNs	HLTH 1269	0
3.		Workshop & Skills Check for Pharmacology registrants	HLTH 1130	0
4.		Pharmacology Clinical Practicum	HLTH 1131	\$150 plus \$150 if instructor required
5.	Optional	Pharmacology Theory in Class Presentation	HLTH 1308	350.00 (< if co-registered in HLTH 1128)
6.	Subcutaneous Injections	Subcutaneous Injection Theory	HLTH 1266	150.00
7.		Subcutaneous Injection Workshop and Skills Check	HLTH 1267	0
8.	Intramuscular Injections	Intramuscular Injection Theory	HLTH 1122	150.00
9.		Intramuscular Injection Skill Lab	HLTH 1139	0
10.	Combined SC/IM	Parenteral Injections (Combined SC & IM)	HLTH 1292	250.00
11.	“Refresher”	Pharmacology Review	HLTH 1295	250.00
12.	IV Therapy/Blood	IV Therapy Presentation for LPNs	HLTH 1272	150.00
13.	Physician’s orders	Taking and Transcribing Physician’s Orders	HLTH 1138	150.00
14.	Math upgrading	Math for Health Sciences	MATH 1054	68.75 to 275.00/mo plus student fees