

Policy Area: Undergraduate Program	Subject: Clinical Risk Management
Title of Policy: Dosage Calculation Competency	Number:
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I. Policy Statement

Dalhousie University nursing students are required to demonstrate medication dosage calculation proficiency by obtaining a mark of 95% or greater on all calculation competency tests. Competency tests will be administered within designated nursing courses, within the curriculum. Successful achievement of 95% or greater is required before students can progress in the program. Students in clinical practice settings will be unable to participate in medication administration activities until they have successfully passed competency testing.

II. Reason for Policy

Successful completion of the BScN program at Dalhousie University requires that the graduate possess entry-level competencies, as regulated by, the College of Registered Nurses of Nova Scotia (CRNNS) (CRNNS, 2012.). In order to graduate, students must acquire, maintain and continuously demonstrate such competencies, including the responsibility of safe medication administration. An essential component of safe medication administration is the ability to demonstrate competency in dosage calculations. Opportunities are provided throughout various aspects of the BScN Program to meet the competency requirements for dosage calculation.

III. Departments or Areas Affected By This Policy

Undergraduate Nursing Program

IV. Responsibilities for the Implementation of this Policy

- Faculty and staff within the Undergraduate Nursing Program
- Course and clinical instructors
- Administration of the School of Nursing, Dalhousie University
- Students within the Undergraduate Nursing Program, Dalhousie University

V. Procedure:

- A link to the dosage calculations policy will be included in all nursing course templates.
- Specific nursing courses will be designated by Undergraduate Studies Committee (USC) to include competency tests and/or required practice modules (See Appendix 1-Procedural Guidelines).
- The course professor is responsible to explain to students the relevancy of this policy to their course, inform students at least one week in advance of the specific testing date(s)/location(s) and to coordinate testing, remedial and re-testing activities.
- Students who fail to meet the benchmark of 95% on their first calculation tests, may have up to two (2) additional opportunities to re-write within the course. The specific conditions of these rewrite vary depending on the nature of the course (see below).
- The number of dosage calculation re-writes will be recorded in HSPnet data base.
- Students who fail to achieve a 95% on the third test or fail to quality for a re-write due to uncompleted remedial work will not meet the requirements to pass the course. Resulting in a failure in the course

Non-Clinical Courses Requiring Calculation Competency Testing (Non-modified Curriculum)

- Students who did not achieve the 95% pass mark on their initial calculations test may have up to two (2) additional opportunities to re-write.
- A rewrite opportunity will only occur after students have completed assigned remedial work.
- The second competency test will occur during the course semester
- The third and final rewrite (if needed), will occur during the exam period.
- Specific rewrite dates will be set by the course professor, in consultation with students.

Clinical Course with Clinical Practice Integrated across the Term (Non-modified Curriculum)

- Student are required to achieve 95% on calculation competency testing prior is administering medication to clients.
- Students that do not achieve the 95% pass mark on their first dosage calculations test may have up to two (2) additional opportunities to re-write.
- A rewrite opportunity will only occur after students have completed assigned remedial work.

- The second competency test will occur prior to the completion of 25% of the clinical practice portion of the course and the final rewrite (if needed), will occur prior to 50% completion of the clinical practice time for the student.
- Specific rewrite dates will be set by the course professor, in consultation with the student and clinical instructor.

Nursing Courses with Block Clinical At the End of the Semester (Modified Curriculum)

- Students that do not achieve the 95% pass mark on their initial dosage calculations test may have up to two (2) additional opportunities to re-write.
- A rewrite opportunity will only occur after students have completed assigned remedial work.
- Students must successfully achieve the 95% benchmark on calculation competency testing in order to meet the requirement to beginning clinical practice associated with the semester.

VI. Web Address for this Policy

<http://www.dal.ca/faculty/healthprofessions/nursing/current-students/student-handbooks-and-policies.html>

VII. Related Resources and References

- Coyne, E., Needham, J., & Rands, H. (2013) *Enhancing student nurses' medication calculations knowledge; integrating theoretical knowledge into practice*. Nurse Education Today 33, 1014-1019.
- CRNNS. (2012). *2012 Standards of Practice for Registered Nurses*.
<http://www.crnns.ca/documents/RNStandards.pdf>
- Hunter Revell, S. & McCurry, M. (2013). *Effective pedagogies for teaching math to nursing students. A literature review*. Nurse Education Today 33, 1352-1356.
- McMullen, M., Jones, R., & Lea, S. (2010). *Patient safety: numerical skills and drug calculation abilities of nursing students and Registered Nurses*. Journal of Advanced Nursing Practice 4, 891-899
- Meechan, R., Mason, V., & Catling, J. (2011). *The impact of an integrated pharmacology and medicines management curriculum for undergraduate adult nursing students on the acquisition of applied drug/pharmacology knowledge*. Nurse Education Today 31, 383-389.
- Stolic, S. (2014). *Educational strategies aimed at improving student nurse's medication calculation skills: A review of the research literature*. Nurse Education in Practice. 14(5), 491-503. <http://dx.doi.org/10.1016/j.nepr.2014.05.010>
- University of New Brunswick Saint John. (2013). *Student Handbook: Math Policy*
<http://www.unb.ca/saintjohn/sase/dept/nursing/20132014nursingstudenthandbook.pdf>
- University of Prince Edward Island. (2013). *Mathematics Competency Tests*

http://files.upei.ca/nursing/mathematics_competency_policy.pdf

University of British Columbia. (2013). *Medication dosage calculation assessment policy for the UBC Okanagan School of Nursing*

http://www.ubc.ca/okanagan/nursing/_shared/assets/medication_dosage_calculation_policy37689.pdf

Appendix A

Table 1: Designated Courses for Math Proficiency Learning Modules

COURSES	Elsevier Dosage Calculations MODULES
Nursing 1000	Basic Math Review
Nursing 1240	Module 1: Systems for drug administration Module 2: Conversions within metric and household systems
Nursing 2200	*Module 3: Interpretation of Drug label, drugs orders, et *Module 4: Prevention of medication errors Module 5: alternative methods of drug administration *Module 6: methods of calculation *Module 7: methods of calculations for individualized drug dosing *Module 8: oral and enteral preparations *Module 9: injectable preparations *Module 10: IV preparations *Module 11: Pediatric drug dosing *Module 12: critical care
Nursing 2050	*Module 3: Interpretation of Drug label, drugs orders, et *Module 4: Prevention of medication errors *Module 6: methods of calculation *Module 7: methods of calculations for individualized drug dosing *Module 8: oral and enteral preparations *Module 9: injectable preparations *Module 10: IV preparations *Module 11: Pediatric drug dosing *Module 12: critical care
Nursing 3260	Module 14: Labour and delivery
Nursing 4210	Module 13: Pediatric critical care

Nursing 4250/4260	Module 15: community (community course)
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*The content of these modules crosses both courses and a decision needs to be made where each will be incorporated.

Table 2: Designated Courses for Dosage Calculation Proficiency Testing

Dosage Calculation Proficiency Testing	Theory Courses	Clinical Courses
Year 2	Nursing 2050 Nursing 2200	Nursing2280 Nursing 2220 Nursing 2220A
Year 3		Nursing 3260 Nursing 3280 Nursing3290
Year 4		Nursing 4210 Nursing 4220 Nursing 4240

Table 3: Designated Courses for Calculation Competency Testing and Learning Modules
 In the Modified Curriculum (starting September 2016)

Semester and Course (s)	Safe Medicate Modules	Proficiency Calculation Testing
Semester 3		
Semester 4		
Semester 5		
Semester 6		
Semester 7		
Semester 8		