

Moving Beyond the Math: Implementing the ATI RN Dosage Calculation 3.0 Assessments in a BSN Curriculum

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Purpose

The purpose of implementing a new teaching strategy was to change the focus of the traditional medication calculation exam from a "numbers only" process to a multifaceted competency-based approach.

Background

- Nursing students throughout the United States are required to complete high-stakes assessments to measure "medication" competency.
- Traditional high stakes medication assessments place significant focus on calculation rather than medication administration competency.
- The faculty in a first year course and second year specialty course in an upper division BSN program identified a need to improve student medication administration competency rather than calculation abilities.
- Current research recommends a multifaceted approach to assessing readiness to administer medications during clinical rotations including: providing and relating skills learned in simulation to specific medications, appropriate dosages and administration routes.
- The goal is to create an assessment process for medication administration competency which is similar to the medication administration process required in the acute care clinical setting.

Process

- The Undergraduate Curriculum Committee approved the change in the method of assessment for medication calculations in the first year "Essentials" course and the Senior level pediatric course.
- Course Faculty determined when the ATI RN Dosage Calculation 3.0 would be given and the process for "retakes"
- The ATI RN Dosage Calculation 3.0 exams include assessments of both calculation and administration reported as "Foundations" and "Calculations"
- Students had 3 attempts to achieve the required score
- First year student took both the RN Fundamentals and RN Medical/Surgical Calculation 3.0 exams.
- Required score for first year students was a 92%
- Senior Students in the Pediatric course had 3 attempts to achieve the required 92%

Group Performance Profile
Dosage Calculation RN Fundamentals Proctored Assessment 3.1

Assessment #: [REDACTED]	Adjusted Group Score:	96.5%
Institution: TX State U	% of Group Meeting:	92.8%
Program Type: BSN	Institution Benchmark:	92.8%
Group Size: 99		
Date Test: [REDACTED]		

Group Performance in the Major Content Areas

Sub-Score	Percent	Score
Foundations	8	92.8%
Calculations	91	96.5%

Group Performance Profile
Dosage Calculation RN Adult Medical Surgical Proctored Assessment 3.1

Assessment #: [REDACTED]	Adjusted Group Score:	96.1%
Institution: TX State U	% of Group Meeting:	93.9%
Program Type: BSN	Institution Benchmark:	93.9%
Group Size: 99		
Date Test: [REDACTED]		

Group Performance in the Major Content Areas

Sub-Score	Percent	Score
Foundations	8	92.8%
Calculations	91	96.5%

Group Performance Profile
Dosage Calculation RN Nursing Care of Children Proctored Assessment 3.1

Assessment #: [REDACTED]	Adjusted Group Score:	92.4%
Institution: TX State U	% of Group Meeting:	79.7%
Program Type: BSN	Institution Benchmark:	79.7%
Group Size: 98		
Date Test: [REDACTED]		

Group Performance in the Major Content Areas

Sub-Score	Percent	Score
Foundations	20	79.7%
Calculations	78	92.4%

First Year Students

ATI RN Fundamentals and Medical/Surgical Dosage Calculation 3.0 Proctored Assessments

Protocol

- Students at this level were administered 2 Proctored Assessments.
- Practice Assessments and Tutorials of Dosage Calculation and Safe Medication Administration 3.0 were assigned prior to the proctored assessments.
- Students had 3 attempts on each assessment to achieve the required 92%.
- Student performance on the proctored assessments were tied to medication administration skill competencies using the ATI Skills Modules 3.0 and a face-to-face skills check-off.
- The scores on the proctored assessments were included as 6% of the course grade.
- The proctored assessments were administered during Week 11 of a 16-week year (69% of the way through the year).
- Week 11 was chosen so that students had completed the over 50% of the year and prior to in-hospital clinical.

Group Module Report
 Tutorial: Dosage Calculation and Safe Medication Administration 3.0
 Module: Safe Dosage

Institution: TX State U	Adjusted Group Score:	97.2%
Program Type: BSN	% of Group Meeting:	94.8%
Group Size: 180	Institution Benchmark:	94.8%

Tutorial: Safe Dose Time in Lesson and Composite Score

Dosage Calculation 3.0 Safe Dosage Test Information

Module	Time Use	Composite Score
Lesson	75 to 25 min	N/A
Proctored	45 to 6 min	97.2%

Group Module Report
 Simulation: Skills Modules 3.0
 Module: Concepts of medication administration

Institution: TX State U	Adjusted Group Score:	97.2%
Program Type: BSN	% of Group Meeting:	94.8%
Group Size: 181	Institution Benchmark:	94.8%

Skills Modules 3.0
 Concepts of medication administration

Module	Time Use	Composite Score
Lesson	50 to 14 min	N/A
Proctored	9 to 20 min	97.2%
Proctored	13 to 6 min	79.2%

Group Module Report
 Simulation: Skills Modules 3.0
 Module: Intravenous medication administration

Institution: TX State U	Adjusted Group Score:	97.2%
Program Type: BSN	% of Group Meeting:	94.8%
Group Size: 61	Institution Benchmark:	94.8%

Skills Modules 3.0
 Intravenous medication administration

Skills Modules 3.0
 IV therapy and peripheral access

Module	Time Use	Composite Score
Lesson	20 to 11 min	N/A
Proctored	1 to 20 min	92.7%
Proctored	2 to 50 min	68.0%

Group Module Report
 Simulation: Skills Modules 3.0
 Module: IV therapy and peripheral access

Institution: TX State U	Adjusted Group Score:	95.2%
Program Type: BSN	% of Group Meeting:	80.6%
Group Size: 108	Institution Benchmark:	80.6%

Skills Modules 3.0
 IV therapy and peripheral access

Module	Time Use	Composite Score
Lesson	17 to 50 min	N/A
Proctored	12 to 10 min	80.6%
Proctored	10 to 47 min	95.2%

Senior Year Students

ATI RN Nursing Care of Children Calculation 3.0 Proctored Assessments

Protocol

- The Pediatric course is taught during the second year of the program.
- Students at this level were administered the Dosage Calculation RN Nursing Care of Children 3.0.
- Students were required to achieve a 92% on 1 of 3 attempts
- The initial Assessment was administered on the first day of simulation and the retake was given during simulation 2 weeks later.
- Students at this level were also required to demonstrate medication competency during each of 4 high fidelity simulations.

Senior Specialty Course	Assessment (N=75)	Retake (N=23)
Group Score	92.4	96.5
Percent meeting 92% Benchmark	71% (N=53)	96% (N=22)
Percent Not Meeting Benchmark	29% (N=22)	4% (N=1)

Foundations Behaviors	Assessment: Group Average Score (74.9%) (N=75)	Retake: Group Average Score (94.8%) (N=23)
Convert quantities between units of measure	68%	97.8%
Convert quantities within the metric system	93.3%	100%
Interpret components of medication Label(s)	94.7%	100%
Interpret Medication Order(s)	50.7%	78.3%
Calculations	93.7%	97%

Results of Attempt 1 and Retake with the breakdown of each section.

Group Module Report
 Tutorial: Dosage Calculation and Safe Medication Administration 3.0
 Module: Pediatric Medications

Institution: TX State U	Adjusted Group Score:	97.2%
Program Type: BSN	% of Group Meeting:	94.8%
Group Size: 76	Institution Benchmark:	94.8%

Group Report for the Pediatric Medication Module

Module Overview

Module	Time Use	Composite Score
Lesson	62 to 40 min	N/A
Proctored	35 to 30 min	95.4%

Group Performance Profile
Dosage Calculation RN Nursing Care of Children Online Proctored Assessment 3.0

Assessment #: [REDACTED]	Adjusted Group Score:	87.4%
Institution: TX State U	% of Group Meeting:	87.4%
Program Type: BSN	Institution Benchmark:	87.4%
Group Size: 98		
Date Test: [REDACTED]		

Group Performance in the Major Content Areas

Sub-Score	Percent	Score
Foundations	20	79.7%
Calculations	78	92.4%

Group Report for the Dosage Calculation RN Nursing Care of Children 3.0 Assessment.

Conclusions

- The assessment of medication competency in nursing students has primarily been focused on calculation ability.
- The move toward competency-based student assessments, presents an opportunity for nursing faculty to re-examine the use of "high-stakes" faculty produced medication calculation exams as the best method for assessing nursing student medication competency.
- The experience of 2 courses at different levels within a upper division BSN program with implementing the ATI Proctored Dosage Calculation RN exams has resulted in other courses planning to implement both skills and calculation exams as an assessment method for medication administration competency.
- The shift in practice from a calculation competency to a holistic competency-based medication administration method of student assessment.

Recommendations

- Competency-based education challenges nursing faculty to develop
- Nursing Faculty are encouraged to reassess their programs medication based high-stakes exams policy and develop assessments focused on the complete medication administration process.
- Nursing Faculty, if not already using the ATI RN Dosage Calculation assessments as part of a holistic evaluation of student readiness to administer medications, are encouraged to add the product.
- Recommendations for Nurse Educators can be found in an article by: Tonya Schneidreith and Erik Barr
 - A National Survey of Medication Dosage Calculation Teaching Methods and Competency Criteria on Nursing Student Success: Recommendations for Nurse Educators: Nursing Education Perspectives [44\(1\):p 11-17, 1/2 2023](https://doi.org/10.1097/01.NEP.0000000000001044). | DOI: 10.1097/01.NEP.0000000000001044



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