# Bridging the Gap in Student Learning Through Simulation Immersion Mapped to Curriculum Content

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MARCH 27, 2020

The presenters do not have any conflict of interest to report.

# Learning Objectives

At the end of this session the learner will be able to:

- Verbalize ways in which educators can identify gaps in student knowledge utilizing curricular exams and standardized testing.

- Describe how to bridge student knowledge gaps identified through curricular and standardized testing utilizing simulation.

- Discuss best practices for implementing simulation.

# Nursing Program Used for Project

- 16 month accelerated post baccalaureate BSN program

- Northeast US

# Assessment of Student Knowledge Gaps

| Didactic Exam Scores | Standardized Mid-curricular Exam Scores | Final Exam Scores | Core Faculty Experience | Student Feedback | Clinical Faculty Experience |
|---|---|---|---|---|---|

Objective Measures
- Didactic Exam Scores
- Standardized mid-curricular Examinations
- Final Exam Scores

Subjective Measures
- Core Faculty Experience
- Clinical Faculty Experience
- Student Feedback

# Health Education Systems, Inc.® (HESI)

- HESI scores predict success on the National Council Licensure Examination for Registered Nurses (NCLEX-RN)(Barton, Wilson, Langford, & Schreiner, 2014).

- Faculty is tasked with finding meaningful ways to address knowledge gaps identified by standardized testing (Sportsman, 2018).

- Students are expected to transition seamlessly into practice upon graduation with basic knowledge and skill for safe patient care (Distelhorst & Wyss, 2013).

# Evidence Based Strategies

- Evidence shows that didactic teaching methods alone do not adequately prepare students for clinical or nursing knowledge retention (Merriman, Stayt, & Ricketts, 2014).

- The best educational practice is to include a variety of methods that actively involve and engage students to collaborate (Parker, McNeill, & Howard, 2015).

Learn ➤ Apply ➤ Test

# Evidence Based Strategies

- Simulation is an educational alternative that can effectively bridge the gaps between didactic learning and clinical practice and improve student knowledge using technology (Pinar, Abay, & Akalin, 2016a).

- Research shows that the use of simulation is one method that positively impacts standardized test scores (Sarasnick, Pyo, & Draper, 2017).
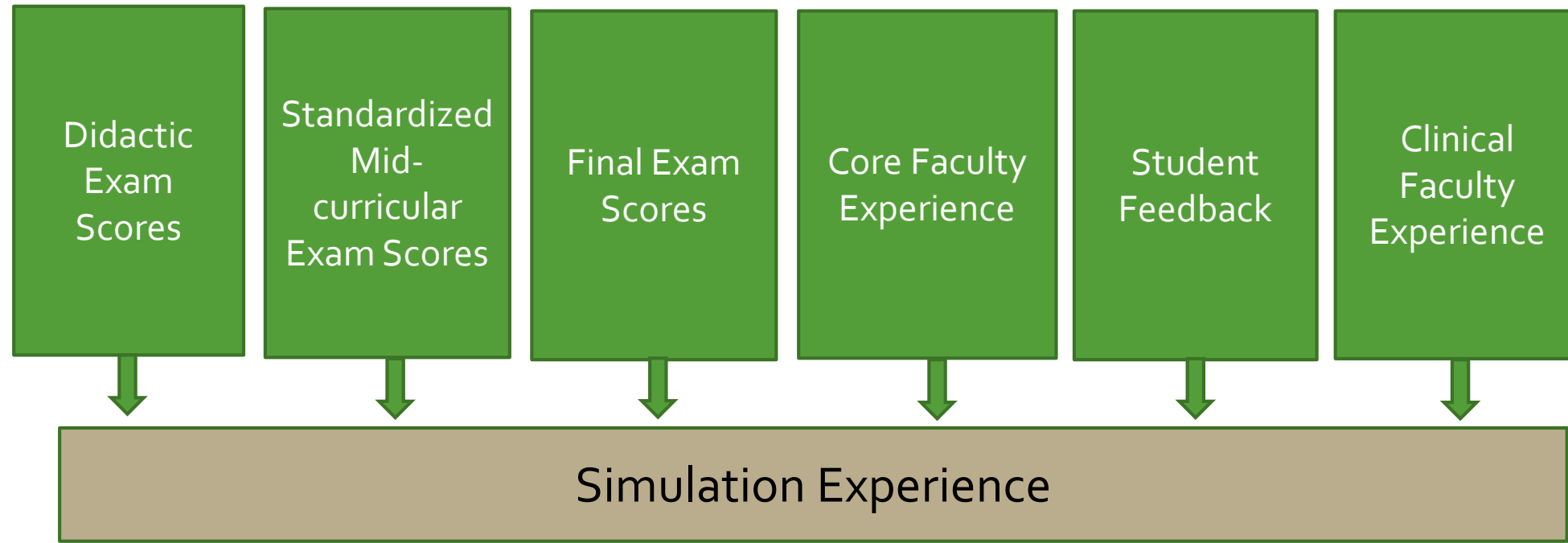
# Simulation

- Simulation has been documented as a strategy to provide focused learning activities for nursing students over the last decade (Scherer, Foltz-Ramos, Fabry, & Chao, 2016).

- Simulation is a safe way to allow students to make mistakes and learn from other students in a variety of traditional and non-traditional settings (Distelhorst & Wyss, 2013; Herron, Nemith, & Powers, 2017).

- Up to 50% of clinical can be effectively substituted with simulation to provide quality clinical experience (Sarasnick, Pyo, Drapper, 2017).

# Simulation Cont.

- Simulation can enhance student learning, skill, and confidence surrounding topics found in clinical practice (Pinar, Akalin, & Abay, 2016b).

- Providing opportunities for students to practice what they learn didactically improves critical thinking and reasoning and allows students to learn from their mistakes (Scherer, Foltz-Ramos, Fabry, & Ying-Yu, 2016).
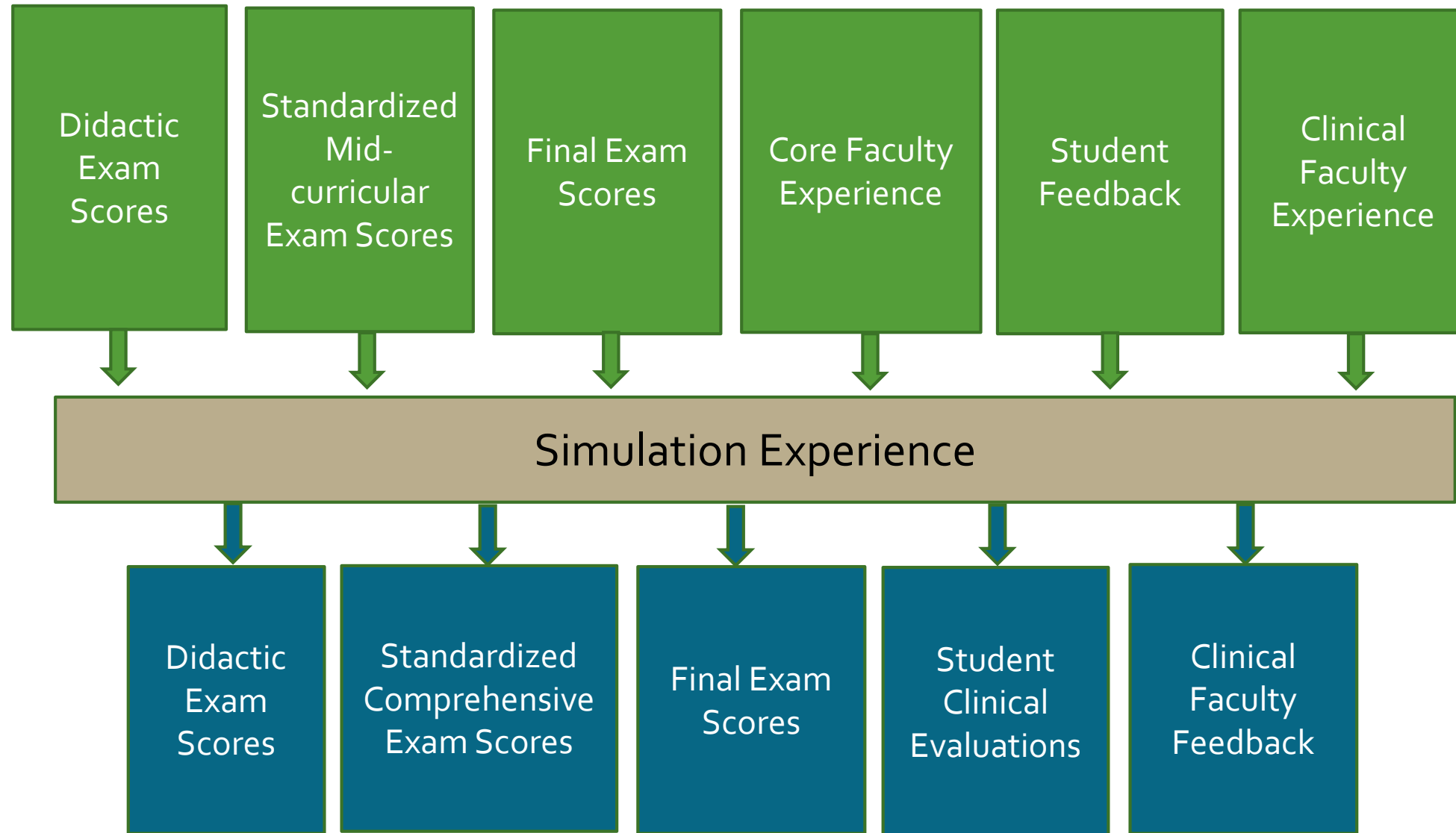
# Development of Plan to Address Knowledge Gaps

| Didactic Exam Scores | Standardized Mid-curricular Exam Scores | Final Exam Scores | Core Faculty Experience | Student Feedback | Clinical Faculty Experience |
|---|---|---|---|---|---|

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**Simulation Experience**

# Strategies for Simulation

- Best educational practice is to include a variety of methods that actively involve and engage students to collaborate (Parker, McNeill, & Howard, 2015).

- Simulation improved student confidence to provide quality care in clinical settings (Scherer et al, 2016).

- Small & large group discussion

- Unfolding case studies

- Table top exercises (Martin, Furr, Lane, & Bramlett, 2016).

- Audio and/or Video case studies

- Realistic simulated practice environments (Yeager, 2010).

- Standardized patients, role play (Skinner, 2017).

- Debriefing-clinical judgement (Sarasnick et al., 2017).

# Evaluation

| Didactic Exam Scores | Standardized Mid-curricular Exam Scores | Final Exam Scores | Core Faculty Experience | Student Feedback | Clinical Faculty Experience |
|---|---|---|---|---|---|

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## Simulation Experience

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| Didactic Exam Scores | Standardized Comprehensive Exam Scores | Final Exam Scores | Student Clinical Evaluations | Clinical Faculty Feedback |
|---|---|---|---|---|

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# Pilot

- Based on the data collected, faculty from the community health courses created an innovative strategy for implementing a simulation immersion following the presentation of didactic content in each course.

- The simulations allowed students the opportunity to fully explore topics identified as knowledge gaps in the curriculum.

- The simulation immersion occurred prior to content exams, standardized testing, and clinical experience in each course.

# COMMUNITY/ PUBLIC HEALTH COURSE
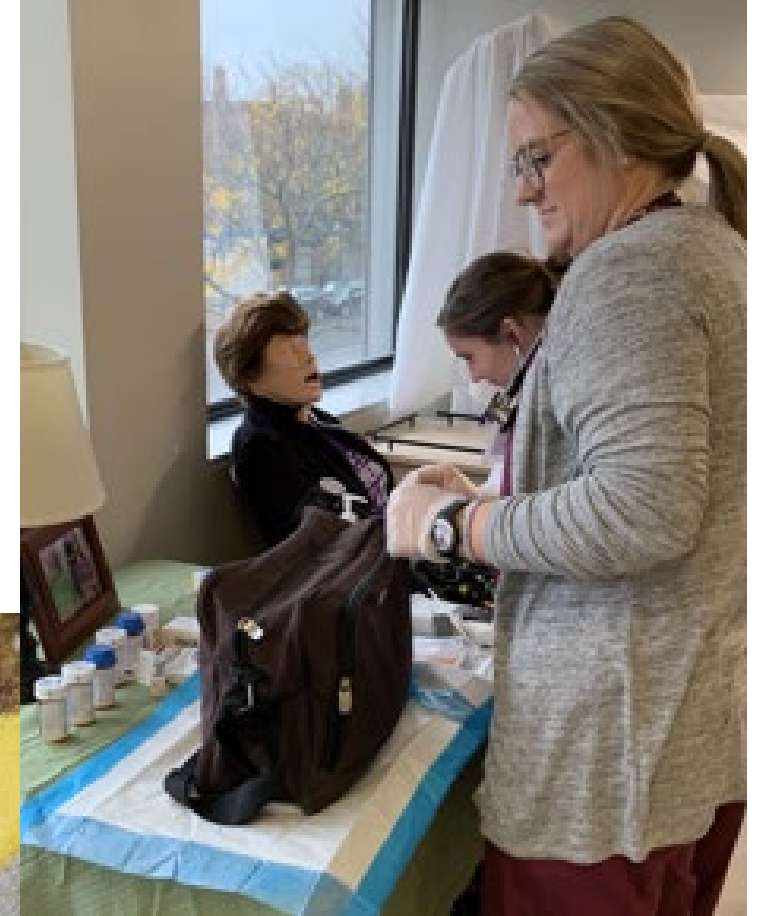
# Gaps Identified Pre-SIM From Community Health HESI Final

| Topic | Fall 2016 | Spring 2017 |
|---|---|---|
| | Pre SIM (N=35) | Pre SIM (N=23) |
| Glucose Regulation | 675 | 689 |
| Intracranial Regulation | 672 | 682 |
| Oxygenation-Gas Exchange | 904 | 771 |
| Perfusion | 772 | 762 |
| Immunity | 737 | 987 |
| Mood & Affect | 413 | 330 |
| Care Coordination | 655 | 821 |
| Advocacy | 751 | 810 |
| HESI Mean | 867 | 898 |

# Simulation Plan

| Week 1
Disaster | Week 2
Henry Williams
(modified from NLN ACES) | Week 3
Family
(4 family members to go community clinical for treatment) | Week 4
Red Yoder
(modified from NLN ACES) | Week 5
Hospital ER
Discharge |
|---|---|---|---|---|
| • Disaster management
• Triage
• Outbreak surveillance
• Bioterrorism
• Prioritization of Care
• NIMS training certificate | • Respiratory Assessment & intervention
• SBAR lab results
• Psychosocial Assessment
• Med Reconciliation
• Discharge Education
• Care Coordination | • Immunizations
• Lead & TB Assessment, screening, & education
• Direct Observation
• Infection Control
• Growth & Development screening
• Environmental risk assessment
• Levels of Prevention
• Care Coordination | • Wound care
• SBAR
• Foley insertion
• Sepsis management
• Care Coordination | • Case management
• Discharge planning
• Home safety/fall evaluation
• Elder abuse |

# Evaluation of Gaps Post-SIM From Community Health HESI Final

| Topic | Fall 2017 | Spring 2018 | Fall 2018 | Spring 2019 |
|---|---|---|---|---|
|  | Post SIM (N=55) | Post SIM (N=30) | Post SIM (N=62) | Post SIM (N=35) |
| Glucose Regulation | 995 | 1031 | 1007 | 962 |
| Intracranial Regulation | 838 | 892 | 885 | 854 |
| Oxygenation-Gas Exchange | 768 | 764 | 1092 | 970 |
| Perfusion | 809 | 1000 | 1063 | 959 |
| Immunity | 1023 | 1095 | 1093 | 1076 |
| Mood & Affect | 916 | Not tested | 956 | 866 |
| Care Coordination | 861 | 905 | 981 | 980 |
| Advocacy | 924 | 1115 | 922 | 923 |
| HESI Mean | 913 | 1020 | 988 | 970 |

# Evaluation: Clinical Faculty Perspective

- Helping students apply concepts discussed in class to patient scenarios.

- Big picture

- Med reconciliation

- Debriefing

- Quality, not quantity of simulation is the key to successful student learning (Sarasnick et al., 2017).

# Evaluation: Student Perspective

- Very receptive and vocal about the benefits of simulation in this course.

- Enjoyed activities that they have not had opportunities to do in depth before including SBAR, documentation, getting and giving report.

- Simulation was structured, realistic, and was a great way to apply concepts from class and previous courses into real life situations.

- Liked debriefing where they had the opportunity to share their ideas and thoughts on the scenarios.

- All students could benefit from hearing ideas that they may not have thought of on their own.

- Allowed to make mistakes and learn from others in a safe environment.

# MEDICAL SURGICAL NURSING I

# Assessment of Student Knowledge Gaps

## Pathopharmacology HESI Final

Iron Supplement Admin- 50.8%

Osteoporosis- 60.7%

Potassium & Digoxin- 32.8%

Analgesic Tolerance Assessment- 55.7%

Heart Failure Patho- 72.1%

Immunity vaccine- 59.0%

Cirrhosis- 29.5%

Digoxin & Kidneys- 26.2%

Ammonia- consciousness- 31.1%

## Health Assessment HESI Final

Melena- 58.8%

Dysuria- 17.6%

Assess Muscle- 38.3%

Audible Wheeze- 44.1%

JVD Assess- 44.1%

Orthopnea- 44.1%

Vesicular Lung Sounds- 52.9%

## Previous HESI Med-Surg I Finals

Safety-Asst Devices- 34.4%

DJD 67.2%

Post-Op Ambulation- 46.9%

Post-Op Bleeding- 26.6%

Thick secretions- 45.3%

Hepatitis C- 45.3%

Digoxin Toxicity- 40.6%

COPD & Infection- 79.7%

HF, emergency sign- 68.8%

# Simulation Plan

## Sim 1: Pneumonia
- Initial signs of hypoxia
- Oxygen delivery device
- Vital signs

## Sim 2: COPD w/ PNU
- Thick secretions
- Medication administration
- Pain assessment

## Sim 4: Digoxin Toxicity
- Hypokalemia
- Hypertension
- Heart Failure
- Med Education
- Safety

## Sim 4: Heart Failure
- Fluid volume overload
- Pinky, frothy secretions
- Independent Nsg Intervention

## Sim 5: UTI
- s/s of UTI
- Urine specimen
- Culture & sensitivity results
- Question appropriateness of catheter

## Sim 6: Urolithiasis
- Pain management
- NSAID vs narcotics
- Renal colic
- Incontinence

## Sim 7: Post-Op DVT
- Focused assessment
- SBAR
- Implement orders
- Pa. education
- Assistive Devices
- Osteoarthritis
- Joint replacement

## Sim 8: Surgical Wound Infection
- S/s Infection
- Wound assess
- Labs & culture
- Pain management
- SBAR
- ORIF

## Sim 9: Upper GI Bleed
- Rheumatoid arthritis
- Osteoporosis
- PUD
- LT steroid use
- Medication safety
- Melena
- Hematemesis
- Hypovolemia

## Sim 10: Pancreatitis
- Alcohol induced hepatitis w/ cirrhosis
- Pain management
- Hyperglycemia
- Medication Admin
- Appropriate diet
- Labs

# Evaluation: Medical-Surgical I Final Exam

| Topic | Previous Final (%) | Final Exam Results (%) | Difference |
|---|---|---|---|
| Post-Op Bleeding | 26.6 | 88.6 | **62** |
| Thick secretions | 45.3 | 100 | **54.7** |
| Safety-Assistive Devices | 34.4 | 82.9 | **48.5** |
| Hepatitis C | 45.3 | 90.5 | **45.2** |
| Post-Op Ambulation | 46.9 | 71.4 | **24.5** |
| Degenerative Joint Disease | 67.2 | 91.4 | **24.2** |
| COPD & Infection | 79.7 | 100 | **20.3** |
| Heart Failure, emergency sign | 68.8 | 71.4 | **2.6** |
| Digoxin Toxicity | 40.6 | 8.6 | **-32** |

# Evaluation Mid-Curricular HESI Exam
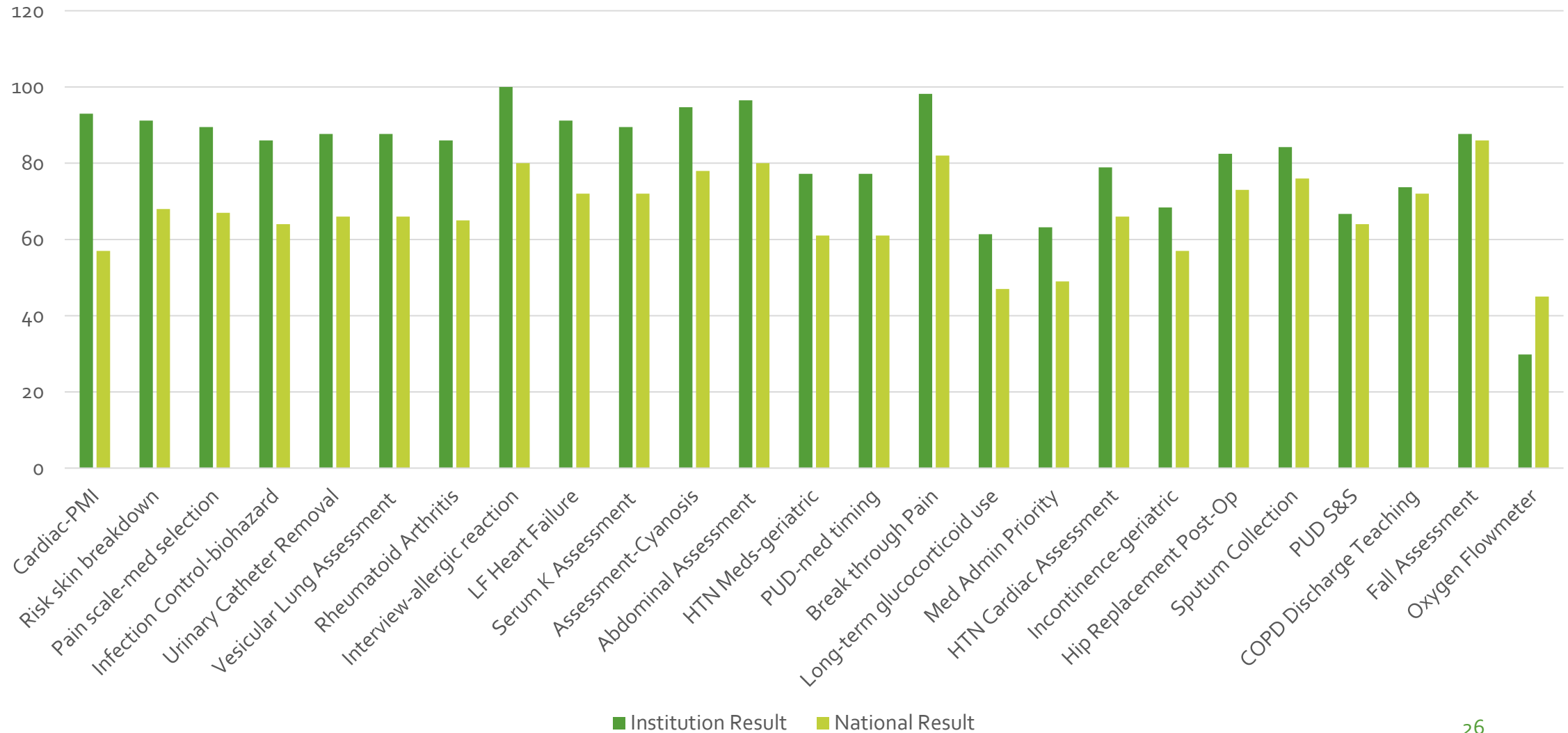
# Evaluation: Clinical Faculty Perspective

- Students have more thorough assessments

- Better prepared for patient interaction

- More active in implementing nursing interventions

- Critical thinking has improved

- More ownership and autonomy of patient care

# Evaluation: Student Perspective



- "I can't overstate how helpful these sims are!"
- "I appreciated the realistic-looking vomit. "
- "I thought the sim content was quite relevant to everything we went over in class."
- "The simulation content was presented just how we were taught in lecture. It was really helpful when we got to discuss the possible interventions and actions to take related to each case. "
- "This simulation was enjoyable and a great learning experience as always. I enjoy how the simulations require us to recall skills we have previously learned and then also pull in what we have learned recently. I really enjoy how they are comprehensive but focused on the learning and not the grade."

# Limitations of Pilot

- Inconsistent implementation across program

- Based on faculty observation & interpretation of HESI/didactic test scores

- Conducted at one university

- Sample size

# Implications for Nursing Educational Practice

- Case studies and simulation mimic patient situations, thus increase retention of nursing care concepts (Sarasnick et al., 2017).

- Knowledge retention increases for those in the simulation and those who observed the simulation (Scherer et al, 2016).

- Simulation increases confidence, problem solving, clinical judgement, and learning transfer to clinical and testing (Merriman et al., 2014)

- Utilizing technology to incorporating simulation across the didactic curriculum prior to exams, has the potential to link theory to practice and improve critical thinking skills, as well as prepare students for success on the NCLEX exam.

# Implications for Future Practice

- Educators may find simulation is effective for increasing student learning (Herron et al., 2017).

- Simulation can be a very useful method to address gaps identified during HESI testing while assisting students in preparing for patient care in a variety of non-traditional settings (Sarasnick et al., 2017).

- Allowing students the opportunity to apply concepts can improve retention of material and improve testing scores.

# Questions?

Thank you!

Have a great day!

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