It Takes a Team:
Creative Strategies for Infusing Diagnostic Reasoning Learning Activities into Nurse Practitioner Curricula

Jacqueline LaManna, PhD, APRN, ANP-BC, BC-ADM, CDE
Assistant Professor

Frank Guido-Sanz, PhD, APRN, ANP-BC, AGACNP-BC
Assistant Professor

Mindi Anderson, PhD, APRN, CPNP-PC, CNE, CHSE-A, ANEF, FAAN
Associate Professor & Program Director Healthcare Simulation Program

Dawn O. Eckhoff, PhD, APRN, CPNP-PC
Instructor & Clinical Placement Coordinator

Christopher W. Blackwell, PhD, APRN, ANP-BC, AGACNP-BC, CNE, FAANP
Associate Professor & AGACNP Program Director

Melanie Keiffer, DNP, APRN, ANP-BC, CNE, CCRN
Assistant Professor & FNP/AGPCNP Program Director

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Objectives

At the end of this presentation, the learner will be able to:

1. Discuss the relationship between diagnostic reasoning and medical error prevention.

2. Compare and contrast pertinent positive and negative considerations associated with three (3) diagnostic reasoning strategies.

3. Formulate a plan to support integration of creative teaching strategies in diagnostic reasoning into an NP curriculum.

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Diagnostic Reasoning Defined

National Academies of Sciences, Engineering, and Medicine. (2015).
Improving diagnosis in healthcare. (p. 32).

- A complex process with a primary goal of identifying a patient's health problem

- Integrates multiple clinical activities that integrate:
  - Information gathering
  - Clinical reasoning

- Patient-centered collaboration

- Core competency for advanced practice nurses

Major Frameworks

- Hypothetico-deductive/analytic approach (Durham, Fowler, & Kennedy, 2014)
  - Systematic review of data
  - Novice clinician or new clinical focus

- Intuitive/hermeneutic approach (Durham et al., 2014)
  - Learned pattern recognition
  - Experienced clinician

- NP students struggle as they transition from experienced nurse role to novice advanced practice nurse (Durham et al., 2014)

Steps in Diagnostic Reasoning Process

- Acquiring data

- Forming a hypothesis

- Evaluating the hypothesis
  - Consideration of supporting/refuting data

- Choosing a primary diagnosis

- Communication with team/patient/family

- Goal setting

- Considering treatment choices

- Evaluating effectiveness of treatment

- Adapted from Chase, S. K. (2004). *Clinical judgment and communication in nurse practitioner practice*. Philadelphia: F.A. Davis

Clinical Judgement

- Incorporates the following processes:
  - Diagnostic reasoning
  - Consideration of situational context
  - Resource evaluation
  - Development of a data-supported treatment plan
    (Cook, 2012; National Academies, 2015)

Diagnostic Reasoning as a Contributor to Medical Error
(National Academies, 2018)

Will affect most people at least once in a lifetime.

Primary contributors:
- Failure to correctly determine cause of health problem
- Lack of timeliness in diagnostic process
- Communication failure

- Associated with lack of proficiency in:
  - Interpretation of data (less likely cause)
  - Flawed synthesis of data (more likely cause)
  - Faulty judgement (more likely cause)

- Building NP student competency in diagnostic reasoning is imperative to fostering safe practice.

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Clinical Decision Trees

- Courses: Adult 1 Primary Care and Pediatric Primary Care
- For assigned presenting problem student groups concisely:
  - Identify 3 most-likely causes
  - Identify critical decision points for each problem giving consideration to:
    - History and physical exam
    - Cost-effective diagnostic plan
    - Supporting and refuting data for each likely diagnosis
    - Clinical management plan

- Example available in [LaManna et al. (2019)](#)

Clinical Decision Trees

- **Pertinent Positives**
  - Provide experience with inductive reasoning and pattern recognition (Coderre et al., 2003)
  - Potential tool for study/clinical practice
  - Provide experience in using algorithms
  - Space limitation promotes skill building for focused assessment
  - Group experience in problem solving

- **Pertinent Negatives**
  - Students may focus on aesthetics rather than process
  - Examples may be available on-line

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Use of Simulation in APN Education

- Potential strategy for teaching diagnostic and clinical reasoning skills using standardized learning experiences.

- Multiple modalities may be useful in NP education:
  - Standardized Patients (SPs) and Objective Structured Clinical Examinations (OSCE's)
  - Virtual patients
  - Telehealth encounters
  - High-fidelity simulations
  - Interprofessional/intraprofessional experiences

- Limited body of evidence addressing impact on student competency and long-term patient outcomes in APN education.

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Episodic Assessment (Problem-based)

- First introduced in health assessment
- Use standardized patients (SPs)

- Additional experiences in later courses
- Progressively increase in complexity/expectations
- Formative and summative experienced; several higher stakes

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Episodic Assessment

- **Pertinent positives**
  - Videotaped

  - Communication/other feedback

  - Determine curricular gaps and those related to diagnostic reasoning

  - Faculty can guide students through decision-making process – presentation and debrief
    (Kurz, Mahoney, Martin-Plank, & Lidicker, 2009; Mason Barber & Schussler, 2018)

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Episodic Assessment

- **Pertinent negatives**
  - Many resources needed
    - Time
      - Within vs. outside of assignment (faculty)
    - Budgeting needs to be considered; may limit addition of new activities

  - Logistical issues
    - Multiple considerations
    - Collaborating partners

  - Formal policies required
    (Anderson, Holmes, LeFlore, Nelson, & Jenkins, 2010; Kutz et al., 2009; Mason Barber & Schussler, 2018)

Virtual Simulation

- Interactive technology – simulates real-world

- Introduced in health assessment course; scaffolded with increasing complexity and assignment additions across several courses
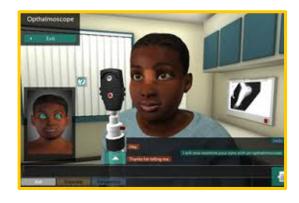

Image used with permission: Shadow Health, 2019

- Diagnostic reasoning skills addressed multiple ways

- Multiple products are available

- Needs to be tailored to student
  - Level
  - Course/program objectives

(Cook, Erwin, & Triola, 2010; Duff, Miller, & Bruce, 2016; Posel, McGee, & Fleiszer, 2015)

Virtual Simulation

- **Pertinent Positives**
  - Allows for online delivery of simulation

  - May be less costly than other types of simulation

  - Provides uniform student evaluation of skills

  - Student performance often compared against vendor-developed exemplars

  - Affords faculty opportunity to objectively identify group performance gaps

(Bryant, Miller, & Henderson, 2015; Johnson et al., 2014)

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Virtual Simulation

- **Pertinent Negatives**
  - Product may not fit student population
    - must be flexible and willing to change
  - Implementation takes time
    - learning curve for ALL
  - Added student costs
  - Contracting can take time
  - Time required by students may be perceived as excessive; how many cases is "too many?" (Posel et al., 2015)
  - Limited cases; most cannot be edited
  - Products may have episodic focus; limited with chronic disease management
  - Students may "game" system

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Virtual Patients

- **MANY** lessons learned!
- Consider grading up front
  - Overall points/percentage of course grade prior to implementation
  - Good understanding of vendor rubrics
  - Start small
- Consider how you will count and time allotted
- Faculty workload considerations

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Simulated On-call Experience

- Course: Pediatric Primary Care

- Instructor Role in Learning Activity:
  - Creates "call schedule" for the semester
  - Generates scenario using complaint coinciding with didactic content
  - Contacts student role-playing a "concerned parent"

- Student Expectations:
  - Availability "on-call" for one week period
  - Responds to "parent" by phone within a reasonable amount of time (1 hour)
  - Addresses the "parent's" concerns appropriately

- Feedback immediately after the experience is completed

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Simulated On-call Experience

Pertinent Positives

- Students:
  - Low-stakes exercise
  - Opportunity to gain experience in triage ranging from advise giving and reassurance to emergency referral (Lewis, Strachen, & Smith, 2012)

- Instructors:
  - Ability to offer immediate feedback after the call
  - Uniformity in presentation of uninformed parent for each student

- Overall:
  - Minimal cost and few resources (Faculty/Student time)

Simulated On-call Experience

Pertinent Negatives

- Students:
    - Being accessible for a week
    - Uncertainty of when call will occur
    - Availability of students who work or are in other clinical
    - Anxiety of not being able to view patient (Kelly, Blunt, & Nestor, 2017)

- Instructors:
    - Availability and planning when to call students and scenarios
    - Incorporated into didactic course and assignment workload

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Acute Care Simulation in AGACNP Programs

Diagnostics and Skills for the Care of the Critically Ill
- *Basic APN Skills*
  - suturing, skin biopsy, abscess I/D, wound mgmt, joint injection/ aspiration, ingrown toenail fishhook removal

- *Critical Care Skills*
  - central line, arterial line, 12-lead ECG, thoracentesis, thoracostomy tube placement, lumbar puncture, bone marrow biopsy, US/ FAST

AGACNP II Clinical
- IPE: Athletic Training + AGACNP Students
- AGACNP-Specific Simulation: Inpatient and Outpatient Management of PNA

AGACNP III Clinical
- AGACNP-Specific Simulation: Inpatient Management of MI

AGACNP Practicum
- AGACNP-Specific Simulation: SNF transfer to ED → Sepsis → Code → ICU → Death

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Acute Care Simulation

Pertinent Positives –

- Students express positive comments all of the AGACNP simulation experiences

- IPE opportunity in AGACNP II allows AGACNP students to learn how to manage athletic equipment during sports-related injuries, work on transfer techniques, and work with AT students in advanced assessment, diagnostics, and other elements of emergent management

- Scaffolding of acuity levels between AGACNP II, III, and Practicum allows students to grow their clinical management skills with increasing acuity levels in simulations and also raises expectations of competency

Acute Care Simulation

Pertinent Negatives

- Collaboration with Faculty from other departments and programs for IPE takes time and resources
  - Planning and ensuring understanding of roles and expectations of performance for each student type varies

- Students need to be notified ASAP of schedule of live simulation experiences, which requires extensive future planning
- Set-up for simulation experiences is burdensome and requires help from lab assistants and other personnel
- Students need clear delineation of roles right at the start of the simulation experience and can sometimes lack initiative

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Concluding Thoughts

Repeated exposure to varied learning activities supports progression of diagnostic reasoning skills from a hypothetical/deductive/analytic approach to a more gestalt intuitive/hermeneutic approach

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Concluding Thoughts

- Collectively, these experience provide opportunities for students to gain experience in elements of diagnostic reasoning including data gathering, patient presentation, clinical documentation and psychomotor skills in a safe environment.

- Ability to identify students who require remediation.

- Progression in case complexity and decision making accomplished via curriculum mapping.

- Teamwork and communication skills, major elements of medical error prevention, are practiced and refined.

- There is a major need for high quality research addressing best-practices for use of simulation in APN education (Nye, et al., 2018).

Concluding Thoughts

- Collectively, these experience provide opportunities for students to gain experience in elements of diagnostic reasoning in a safe environment including:
  - data gathering
  - diagnostic and therapeutic planning
  - patient presentation
  - clinical documentation

- Ability to identify students who require remediation.

- Progression in case complexity and decision making accomplished via curriculum mapping.

- Teamwork and communication skills, major elements of medical error prevention, are practiced and refined.

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- *Discussed with permission*

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