UTILIZATION OF A CONCEPTUAL FRAMEWORK TO TEACH DIAGNOSTIC REASONING TO NP STUDENTS

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OBJECTIVES:

1.) ENUMERATE THEORIES FOR TEACHING DIAGNOSTIC REASONING TO STUDENTS.
2.) DESCRIBE THE STEPS IN FOSTERING DIAGNOSTIC REASONING.
3.) LIST THE PROS AND CONS OF VARIOUS EDUCATIONAL. INTERVENTIONS WHEN TEACHING DIAGNOSTIC REASONING.

The advent of online technologies has led to:

- **Increased opportunities for colleges of nursing to extend their graduate educational curriculums for expanding numbers**

- **Graduate nursing students now have endless choices regarding programs of study, for which they are no longer limited by geographical locations**

Teaching advanced practice students, especially nurse practitioners, within an online teaching platform leads to a special list of challenges for nurse educators!

MAJOR ISSUE IS THE FOSTERING OF DIAGNOSTIC REASONING IN AN ONLINE ENVIRONMENT

Issues:

- Critical Thinking
- Teaching presence
- Role Modeling
- Socialization
- Transition from a live classroom

DIAGNOSTIC REASONING

- is the complex cognitive process used by clinicians from many health care disciplines to ascertain a correct diagnosis and therefore prescribe appropriate treatment for patients.
- **Two Processes:**

1. Intuitive coupled with “Skilled-know-how”
2. Analytical process

Formulate an initial set of hypotheses.

This set of hypotheses is formulated in the context of identified questions and problems in the current case, as well as a knowledge base of prior cases (using illness scripts and pattern recognition).

Experts quickly develop a small set of hypotheses with minimal clinical data to represent the problem to be solved.
Short-term memory can actively handle only about 5 items at once.

Experts will generally have the final diagnosis in this set within 5 minutes of starting.

Novice and intermediate learners will take longer to develop a set of hypotheses.

Two-Process Model of Clinical Reasoning

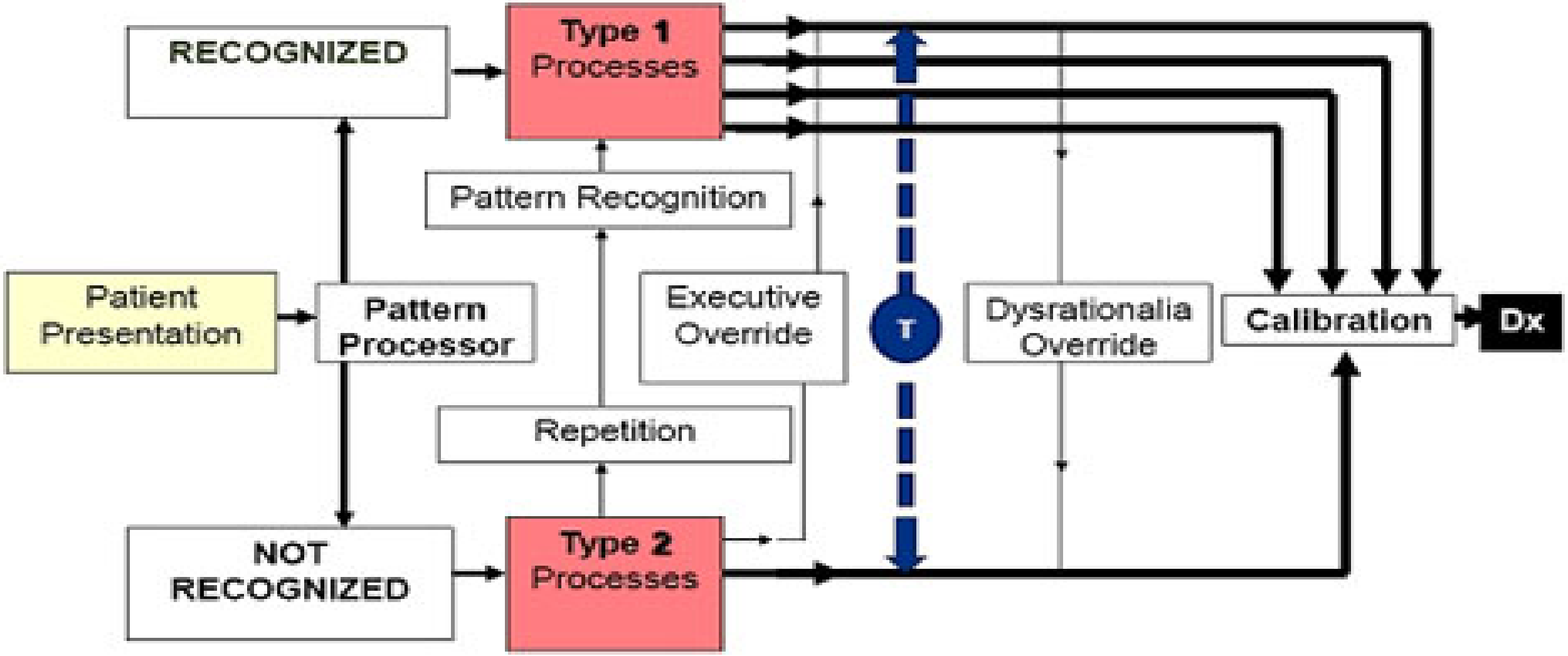
Type 1 (Intuitive) processes are very fast – used by experts most of the time **(Pattern Recognition)**
Type 2 (Rational) processes are slower, deliberate, and more reliable and focus more on hypothesis and deductive clinical reasoning **(Hypothetical-Deductive Reasoning)**

Repetitive operation of **Type 2** leads to **Type 1** (**recognition**: as you see more cases and use **Type 2** process effectively, you will build your own illness scripts and your ability to use **Type 1** process will improve)

Type 2 processing can override **Type 1** **(rational override)**
Type 1 processing can override **Type 2** **(dysrational override)**

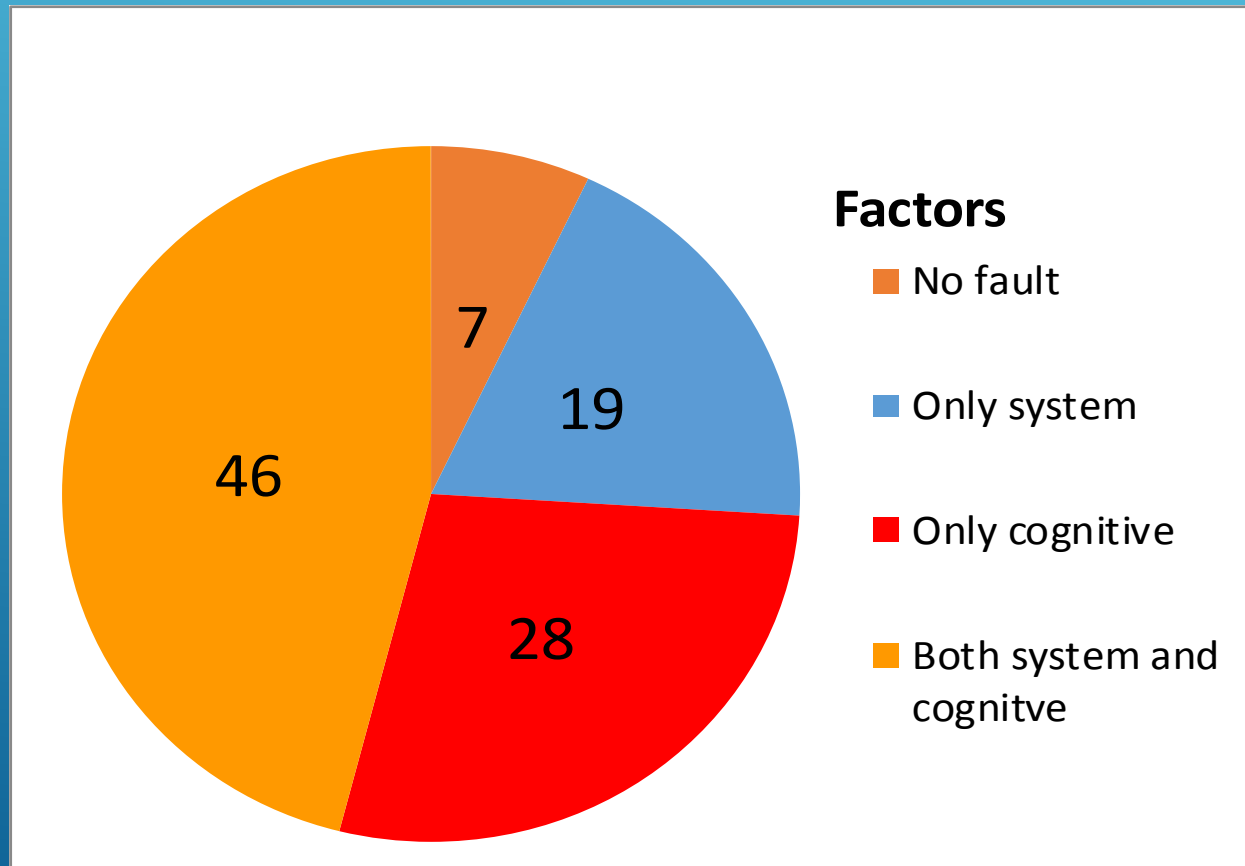
The **Cognitive Miser Function** encourages default to Type 1.
Most errors also take place in Type 1 processing.

Two-Process Model of Clinical Reasoning



DIAGNOSTIC ERRORS

- Diagnostic errors: 5-15% of diagnosis
- Taxonomy of diagnostic error (Graber,2005):
  - No-fault errors
  - System-related errors
  - Cognitive errors
- Cognitive errors contribute to 75% of all diagnostic errors
- 'Premature closure' most common cognitive error



“We’re pretty sure it’s the West Nile virus.”

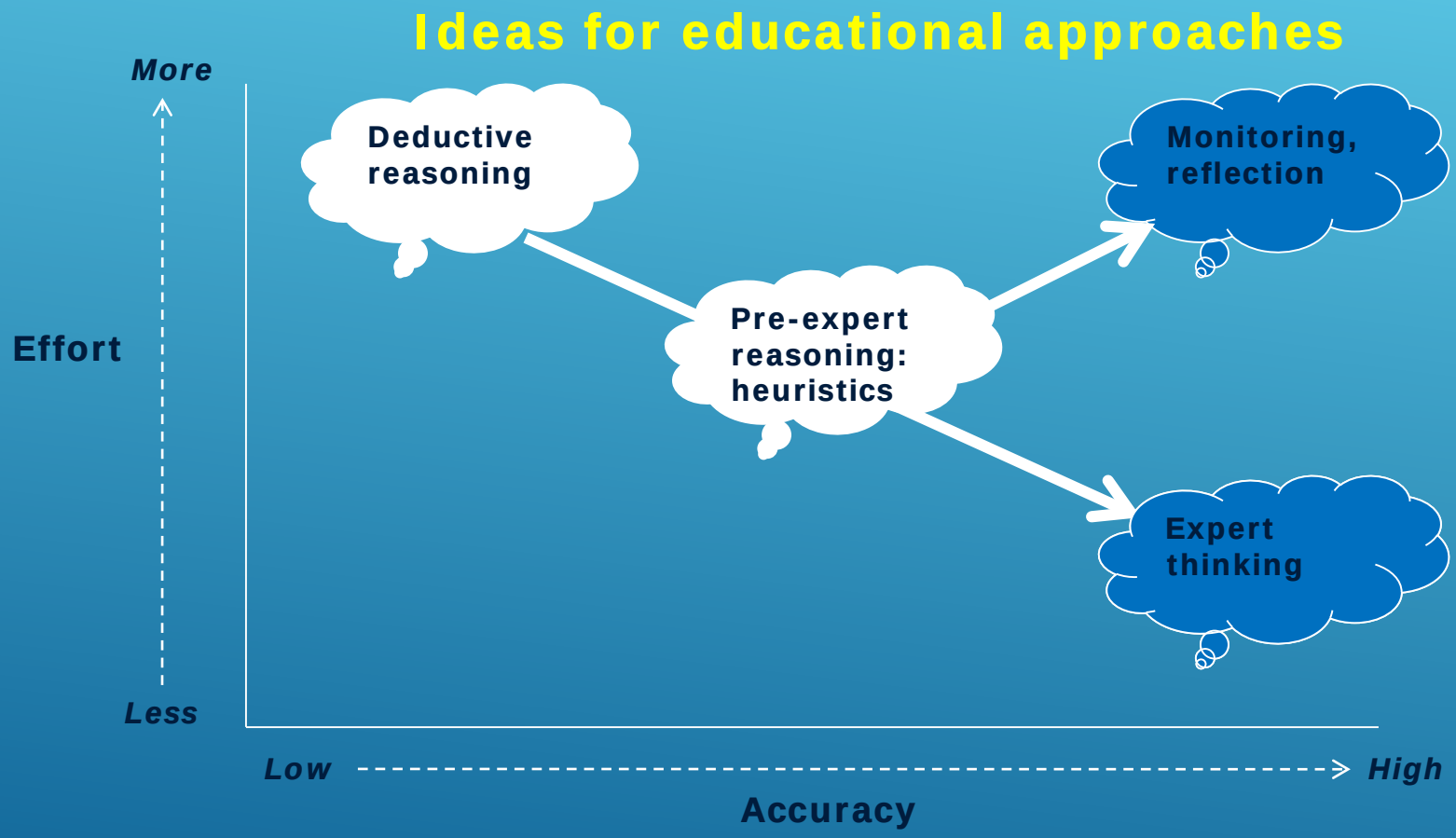
THE CONTENT - TWELVE TIPS "TO PREVENT DIAGNOSTIC ERROR"

- Understand heuristics (Nature of Problem Solving)
- Use "diagnostic timeouts"
- Think "**worst-case scenario**"
- Systematic approach to common problems
- Ask why
- Teach/emphasize history & physical exam
- Teach Bayesian theory (probability)
- Acknowledge your emotions
- Identify what doesn't fit
- Embrace **zebras**
- "Slow down" (**Look for RED FLAGS**)
- Admit mistakes

Trowbridge Medical Teacher 2008

EDUCATION TO PREVENT COGNITIVE ERRORS

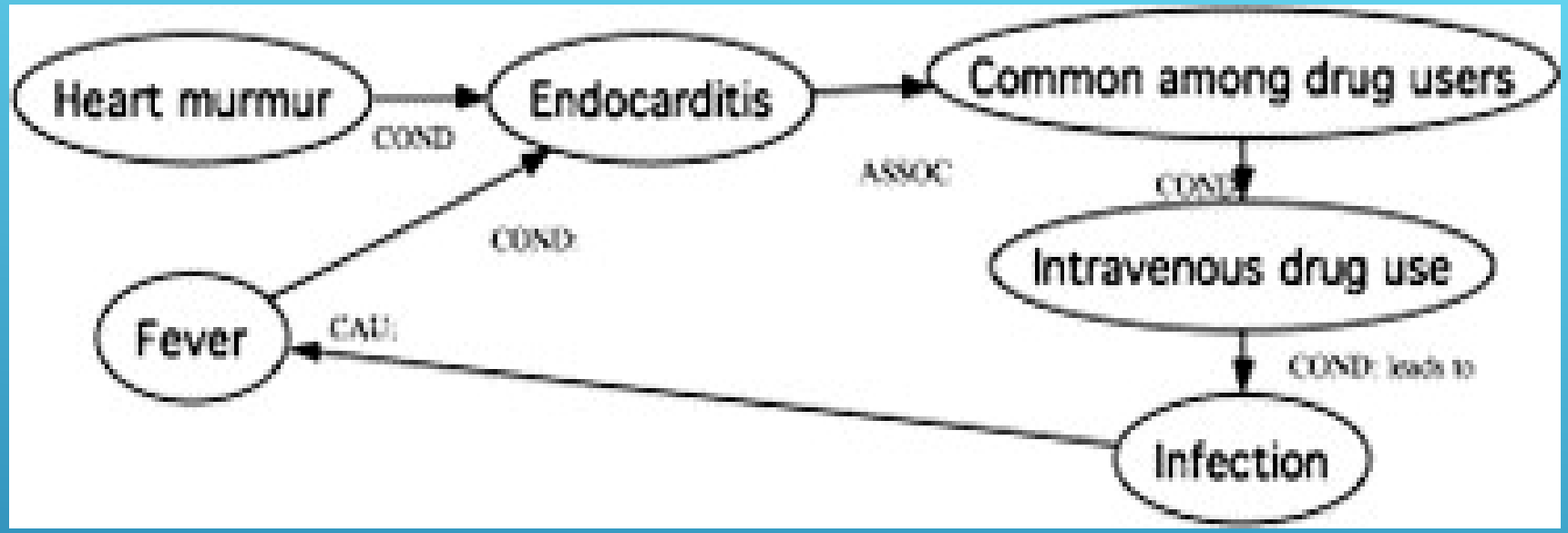
Relationships between reliability and effort of diagnostic decision making (Graber, 2009)



STUDENTS NEED TO LEARN TO APPLY REFLECTIVE THINKING

Learning to:

- **Recognize and understand the most likely diagnostic pitfalls (Croskerry, 2003)**
- **Use a checklist for the diagnostic process including ‘reflection’**



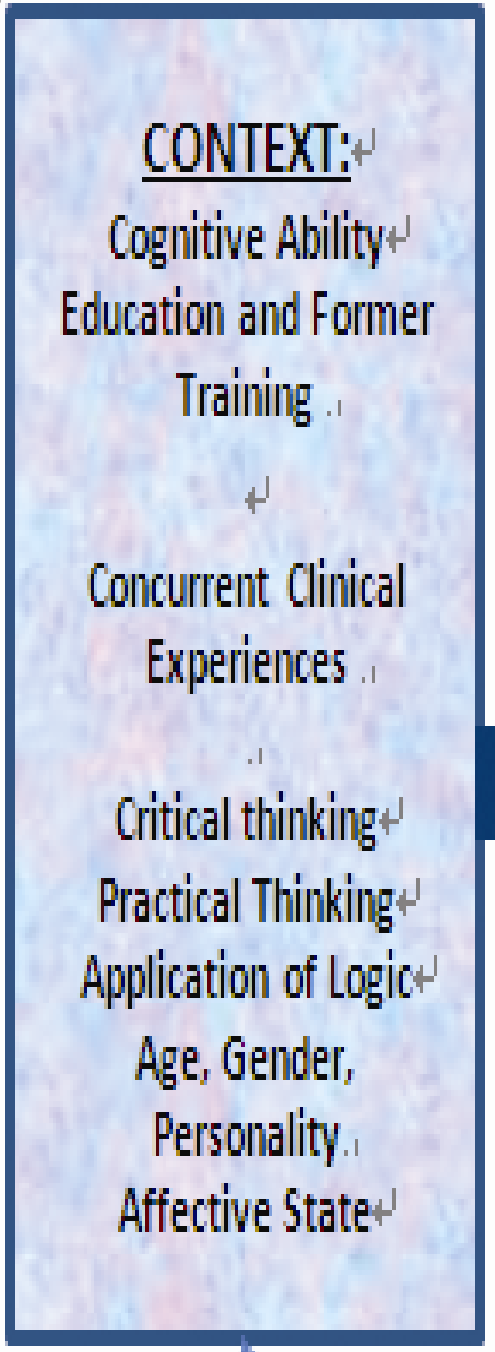
Jose F. Arocha , Dongwen Wang , Vimla L. Patel

Identifying reasoning strategies in medical decision making: A methodological guide

Journal of Biomedical Informatics, Volume 38, Issue 2, 2005, 154 - 171

http://dx.doi.org/10.1016/j.jbi.2005.02.001

How can clinical reasoning be taught and assessed in a competency-based system to reduce diagnostic error?



Context: NP Students were increasingly:

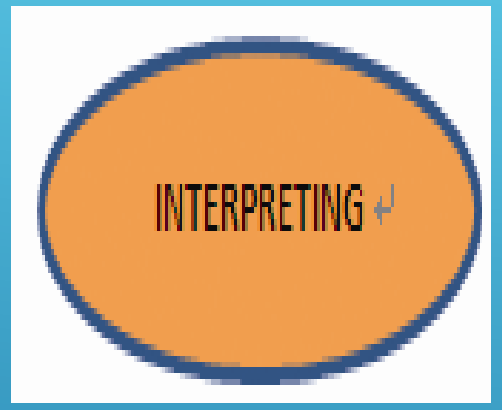
- **Younger**
- **Less experienced as a RN**
- **Little Critical Care Experiences**
- **Lower levels of Emotional Intelligence**

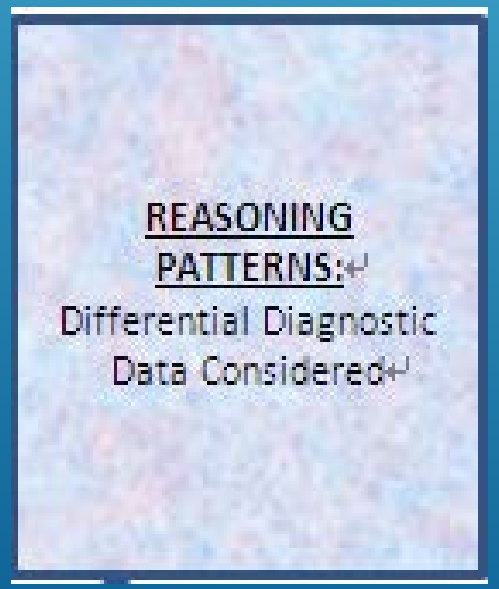
Coupled with an online educational environment

Provided repetitive experiences that required **Pattern Recognition**

Because clinical judgment is influenced by the context by which the student came to us, we were concerned that students with limited clinical experiences could not be expected to easily note or notice clinical findings.

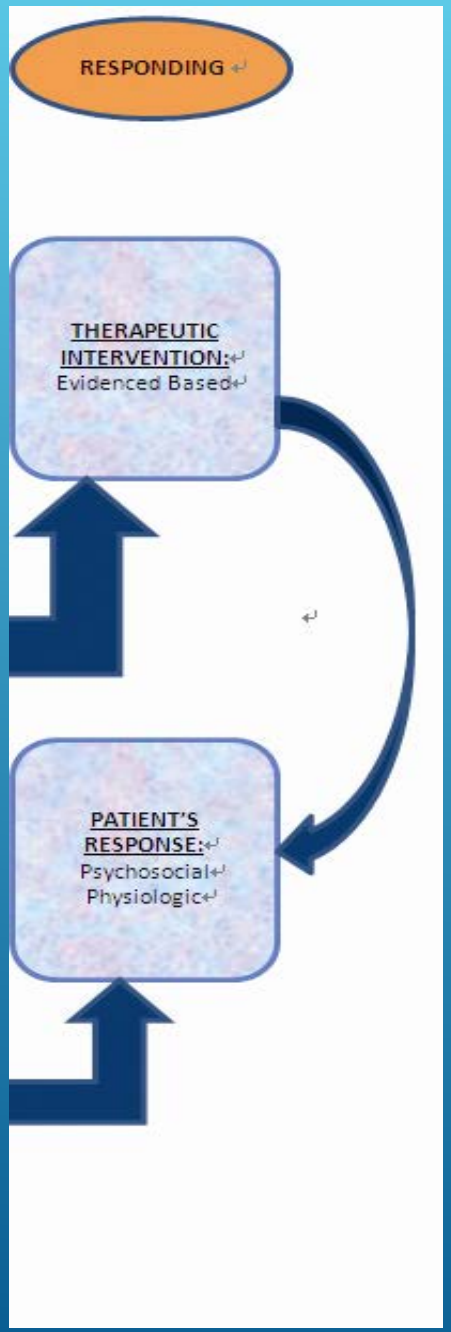
- **Offered case studies in which there were either hallmarks of the case or the red flags of disaster for adverse outcomes**
- **After students worked through the online modules**
  - **Required both their attendance and participation in synchronized online live classrooms where case studies and corresponding plans of care were discussed**





Interpreting involves formulating probable diagnoses and differential diagnoses, as well as assessment skills.

- **A synchronized Online Modules**
- **Synchronized online line case studies**
- OSCE laboratory **prepared from previous presented online case study taught in synchronized classroom**
  - **Standardized Patient Evaluation by Actor**
  - **SOAP Note**
    - list of differential diagnoses and an ultimate final diagnosis
  - **Self-evaluation**
  - **Faculty Overall Evaluation of above**
- **Problem Based Learning (PBL) (Tried and unsuccessful)**

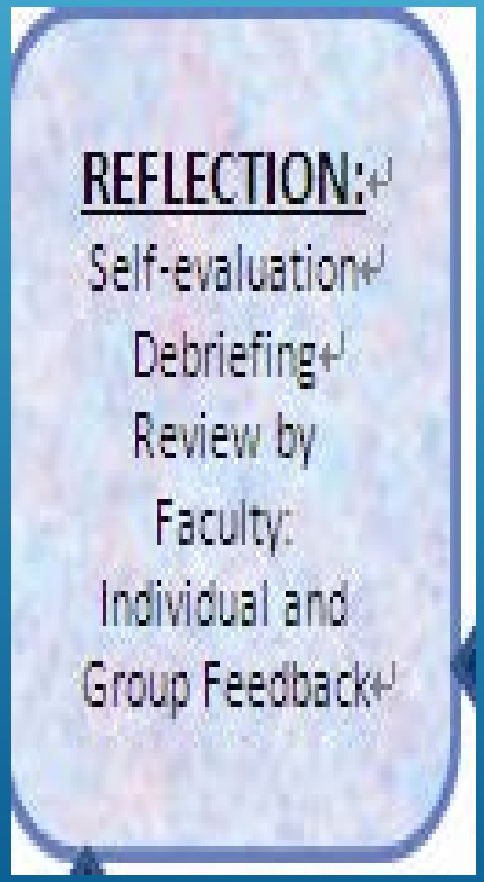


"**Responding**" occurs with consideration of various therapeutic strategies and existing evidence, a written record of the encounter (a SOAP note), and implementation of a therapeutic plan.

Here a feedback loop occurs during which the patient's response to treatment is monitored.

For the student/clinician **reflection** occurs during the process, after which adjustments in the plan of care can be made.

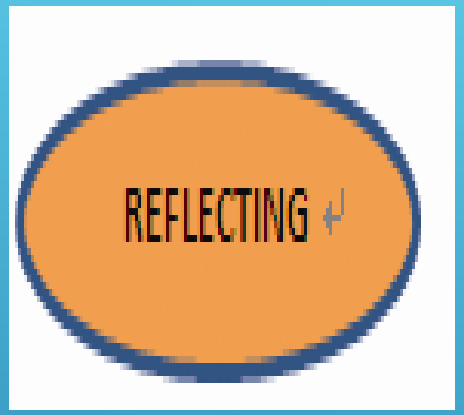
Responding and reflection were both heavily impacted by the course's emphasis on evidence based practice and standard guidelines.

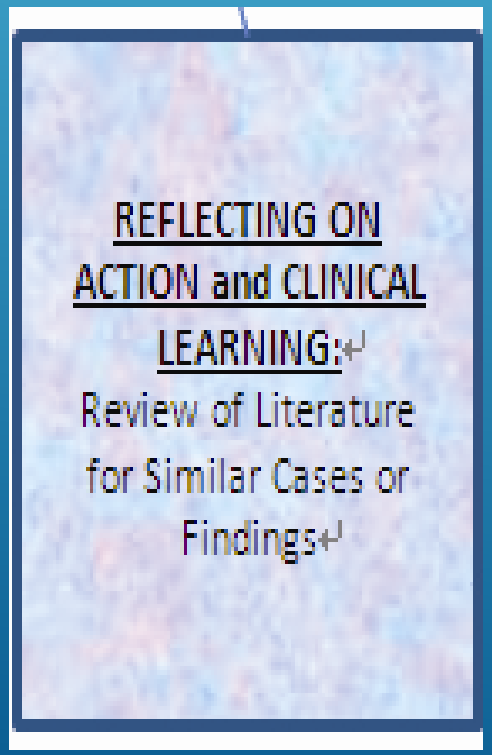


The evaluation of what students and faculty believed was helpful came from numerous sources:

- formal course evaluations
- objective testing
- evaluation of SOAP notes
- input from the standardized patients that students used to conduct complete histories and physicals
- input was routinely obtained from clinical preceptors who shared that students were prepared and had essential basic knowledge for the clinical populations.

Students were "**Debriefed**"

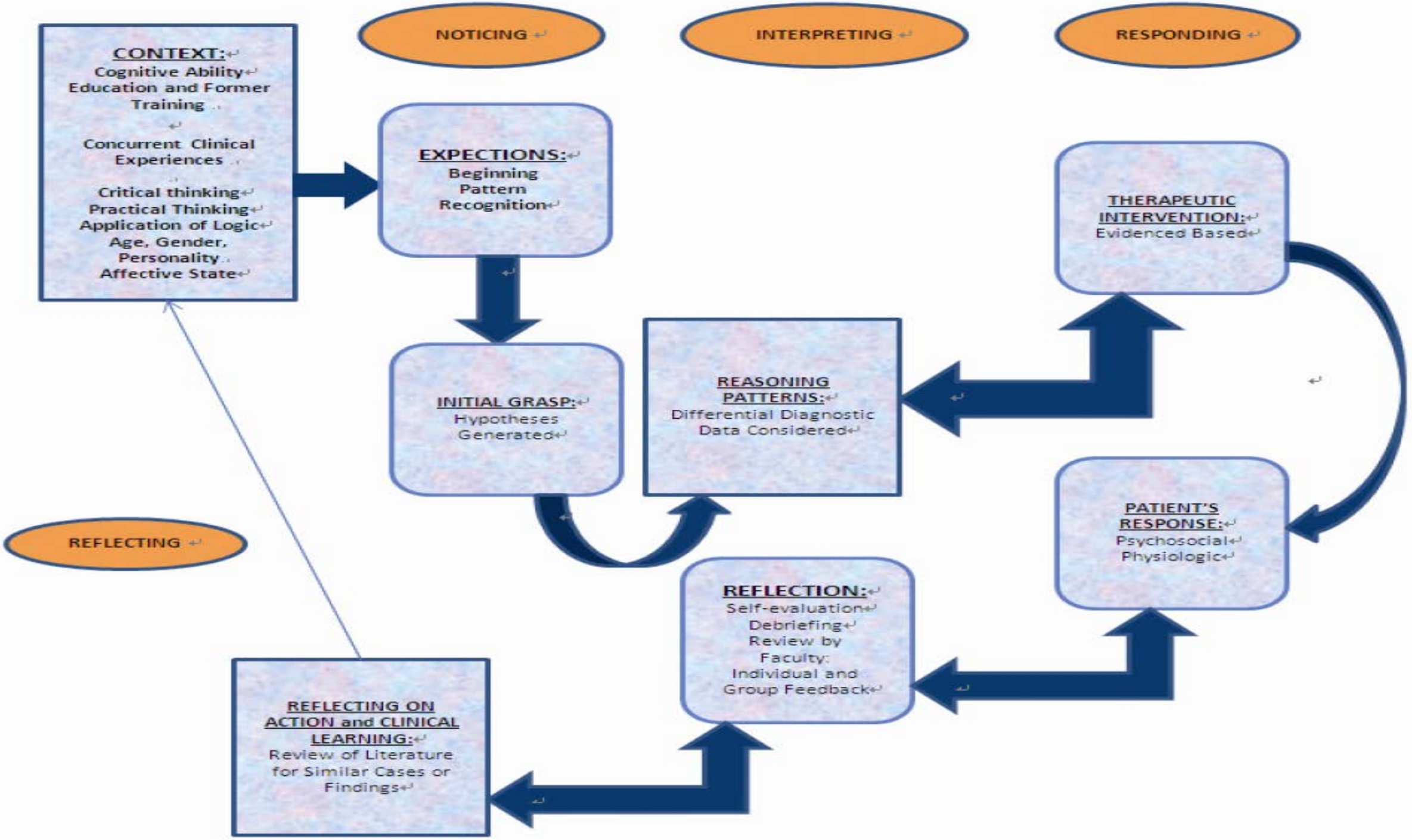




Students were strongly encouraged to:

- **reflect** on their experiences while they were writing their OSCE self-evaluations, being debriefed by the patient actor and receiving **overall feedback** from the faculty
- return to the literature and review the case from the OSCE
- determine if the case had **hallmark findings** or **red flags** or was not fully developed

This intervention was of supreme importance, as many diagnostic decisions are determined based on pattern recognition


NOTICING
INTERPRETING
RESPONDING
CONTEXT:
Cognitive Ability
Education and Former Training
Concurrent Clinical Experiences
Critical thinking
Practical Thinking
Application of Logic
Age, Gender, Personality
Affective State
EXPECTIONS:
Beginning Pattern Recognition
INITIAL GRASP:
Hypotheses Generated
REASONING PATTERNS:
Differential Diagnostic Data Considered
THERAPEUTIC INTERVENTION:
Evidenced Based
PATIENT'S RESPONSE:
Psychosocial
Physiologic
REFLECTION:
Self-evaluation
Debriefing
Review by Faculty:
Individual and Group Feedback
REFLECTING ON ACTION and CLINICAL LEARNING:
Review of Literature for Similar Cases or Findings
REFLECTING

ORIGINAL RESEARCH

Teaching diagnostic reasoning: Transitioning from a live to a distance accessible online classroom in an Adult Acute Care Nurse Practitioner Program

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Abstract

The advent of online technologies has led to increased opportunities for colleges of nursing to extend their graduate educational curriculums for expanding numbers of students. Likewise, graduate nursing students now have endless choices regarding programs of study, for which they are no longer limited by geographical locations. Nurse educators are now being confronted with the need to impart increasingly sophisticated knowledge to growing numbers of students via online technologies. Teaching advanced practice students, especially nurse practitioners, within an online teaching plat- form leads to a special list of challenges for nurse educators. One major issue is the fostering of diagnostic reasoning in an online environment. This article offers an overview of how one Adult Acute Care Nurse Practitioner (ACNP) program transitioned over time from a live classroom curriculum to a distance accessible program.

Key words

Critical thinking, Teaching presence, Distance education, Educational strategies, Simulation

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