Nursing's Role in Reducing Diagnostic Errors

Gene Elizabeth Harkless DNSc, APRN, FNP-BC, CNL, FAANP
Chair and Associate Professor
Department of Nursing
University of New Hampshire
Durham, NH 03824
603 862 2285 geh@unh.edu

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Baccalaureate nursing educators need current resources and tools to prepare students to improve safety in the work of diagnosis.

Participants will gain knowledge about teaching pre-licensure students diagnostic strategies and how to strengthen their role as members of the diagnostic team.

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Quiz #1

1. Diagnostic error is a major public health problem.
    a. True
    b. False

Answer: True.
Diagnostic error happens approximately 5-15% of the time.

Source: Berner and Graber, 2008 and other sources.
https://c.ymcdn.com/sites/www.npsf.org/resource/collection/3550D488-85DF-42C3-A368-38DBF94F5255/Myths-and-Facts-About-Diagnostic-Error-Health-Care-Organizations.pdf

Quiz #2

3. In the landmark Harvard Medical Practice Study II, diagnostic error accounted for what percent of preventable errors in hospitalized patients?
    a. 2%
    b. 7%
    c. 17%
    d. 27%

Answer: 17%
In a sample of 30,195 randomly selected hospital records, authors identified 1133 patients (3.7 percent) with disabling injuries caused by medical treatment and report an analysis of these adverse events and their relation to error, negligence, and disability.

Source: The Nature of Adverse Events in Hospitalized Patients. Results of the Harvard Medical Practice Study II. Leape LL, Brennan TA, Laird N, et al. (1991). *N Engl J Med*: 324:377-384.

Quiz #3

5. Evidence-based guidelines are trustworthy.
    a. True
    b. False

Answer: False.
Overall, a conservative estimate is that 50% of current evidence-based guidelines can be considered untrustworthy depending on how the reliability is measured. On average, guidelines sponsored by medical specialty societies continue to be of lower quality compared to national health agencies.

Source: Wrong guidelines: why and how often they occur. EBM 2017;22:1-3.
http://dx.doi.org/10.1136/ebmed-2016-110606

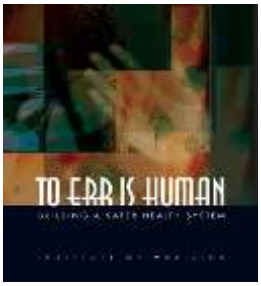
Quiz #4

10. What percentage of diagnostic errors is attributed to vascular events, infection, and cancer?
    a. 20%
    b. 40%
    c. 60%
    d. 80%

Answer: 80%
Vascular events – ischemic stroke and myocardial infarction
Infection – bacterial sepsis
Cancer – delayed diagnosis errors in cancer – specifically lung, breast and colorectal cancer

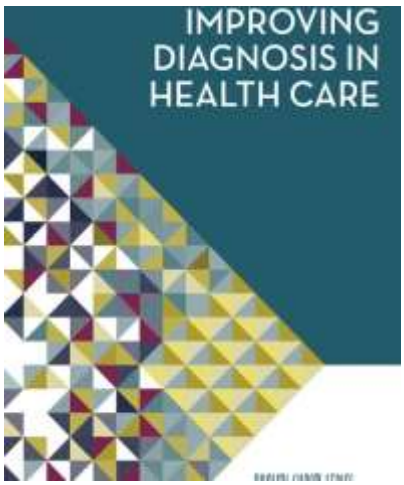
Each year an estimated 12 million Americans get the wrong diagnosis from their provider---a medical problem is seen as something else, missed entirely or identified late. Most of the diagnostic errors are not about rare diseases, and in about one third of these cases the results of the error are serious, even fatal.

Source: The Armstrong Institute Center for Diagnostic Excellence
https://www.hopkinsmedicine.org/armstrong_institute/centers/center_for_diagnostic_excellence/index.html



- "…the majority of medical errors do not result from individual recklessness or the actions of a particular group--this is not a "bad apple" problem. More commonly, errors are caused by faulty systems, processes, and conditions that lead people to make mistakes or fail to prevent them."

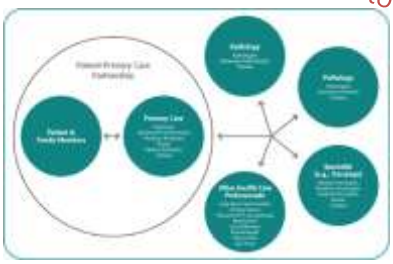
Diagnostic Error



1. Effective teamwork-interdisciplinary, patients, families
2. Education
3. Information Technology
4. Processes to identify, learn from, and reduce diagnostic errors and near misses
5. Supportive system and culture
6. Reporting environment/liability system
7. Supportive payment and care delivery environment
8. Research on diagnostic process and error reduction

"This study was originally titled "Diagnostic Error in Medicine," but based on discussions at its first meeting, the committee concluded that "Diagnostic Error in Health Care" was a more accurate description because it better reflected the **patient-centered and teamwork-oriented aspects of the diagnostic process"**

No reference to nursing diagnosis in document



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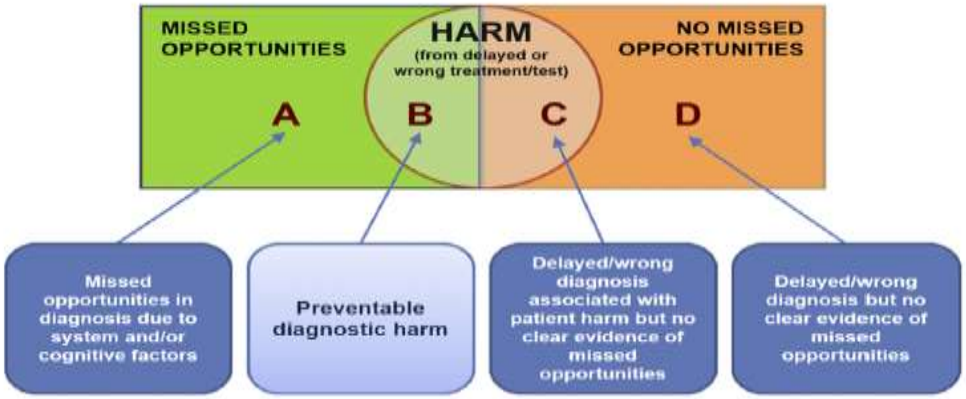

Singh et al. BMJQS 2017; 26:484-494

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Diagnosis in Nursing: An Introduction to Its History and Current Status

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Keep in mind....
"Social agents have the duty of monitoring and upholding the status quo of power relation or risk being seen as unfaithful to their education and their science"
(Foucault, 1988)

Assumption

"The work of nursing is nonlinear and involves complex reasoning and clinical decision making."

Hildegard Peplau 1952

"Understanding of the meaning of the experience to the patient is required in order for nursing to function as an educative, therapeutic, maturing force."

American Nurses Association's (ANA) definition of nursing

"Nursing is the protection, promotion, and optimization of health and abilities, prevention of illness and injury, facilitation of healing, alleviation of suffering through the ***diagnosis and treatment*** of human response, and advocacy in the care of individuals, families, groups, communities, and populations."

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Recent evidence for assumptions

1. Assessment: inquiries made by the RN pertaining to the patients' initial and ongoing physical and psychological conditions and physical observations and measurements.
2. Nursing diagnosis: patient problems and priorities identified by the RN.
3. Planning: consultation and referral activities with patients, physicians, and other health care workers.
4. Interventions: direct and indirect care measures, such as medication preparation and administration, symptom management, and documentation.
5. Evaluation: inquiries or measurements the RN made to determine the patient's response to an intervention.

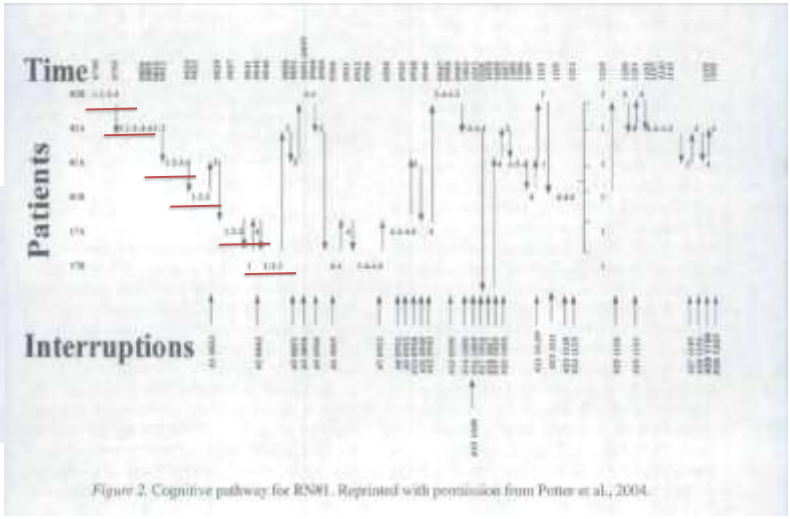

Figure 2. Cognitive pathway for RN01. Reprinted with permission from Potter et al., 2004.

Wolf, L. D., Potter, P., Sledge, J. A., Boxerman, S. B., Grayson, D., & Evanoff, B. (2006). Describing nurses' work: combining quantitative and qualitative analysis. *Human factors*, *48*(1), 5-14.

Each red line above represents a nurse making a diagnosis

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Diagnosing and prescribing to meet human needs

Keeling, A. (2015). Historical perspectives on an expanded role for nursing. *OJIN: The Online Journal of Issues in Nursing*, *20*(2).

"The nurses' dispensing practices would be questioned a few years later, however, with the passage of the 1903 state nursing registration act, which declared: "Nothing contained in this act shall be considered as conferring any authority to practice medicine or to undertake the treatment or cure of disease." (Article XII, 1903). The question was: what constituted the practice of medicine and the treatment of disease in 1903? Did it include the administration of such treatments as mustard plasters and turpentine stupes that were widely prescribed by physicians at the time, but which the HSS nurses routinely gave during their home visits based on their own experience?"

http://www.nursingworld.org/MainMenuCategories/ANAMarketplace/ANAPeriodicals/OJIN/TableofContents/Vol-20-2015/No2-May-2015/Historical-Perspectives-Expanded-Role-Nursing.html

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Back to the future…..

In 1953, Fry first proposed the idea of using the term diagnosis in nursing practice. In arguing that the act of diagnosing was required for individualized care, Fry noted that…

"…it is estimated that one third to two thirds of all medical practice**…**consists of treating patients whose symptoms are, to a great extent, the results of emotional stress," and that the categorization and treatment of these symptoms is nursing practice.

"Once the patient's needs have been identified, we go on to the next step in making the nursing diagnosis."

Fry, V. S. (1953). Creative care is the result of the nurse's emotional as well as intellectual understanding of her patients as individuals, never as types. *AJN The American Journal of Nursing*, *53*(3), 301-302.

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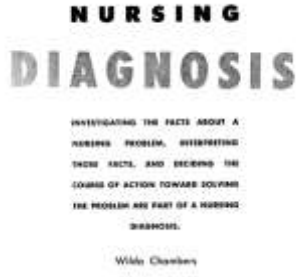
Chambers AJN Nov.1962

"While we usually think of diagnosis as determining the nature of a disease, Webster gives a further definition in the New World Dictionary of the American language: "a careful investigation of the facts to determine the nature of a thing"



"…use of the term diagnosis would pinpoint for the nurse her responsibility to use precise language rather than vague descriptions of the patient's condition ."

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This must be interpreted within it's sociopolitical context

1955

American Nurses Association (ANA) proposed a model nurse practice act:

"The practice of professional nursing means the performance for compensation of any act in the observation, care and counsel of the ill . . . or in the maintenance of health or prevention of illness . . . or the administration of medications and treatments as prescribed by a licensed physician . . . ***The foregoing shall not be deemed to include acts of diagnosis or prescription of therapeutic or corrective measures***. (ANA, 1955, p. 1474)

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Darling v. Charleston Community Memorial Hosp. case brief
Darling v. Charleston Community Memorial Hosp. case brief summary 211 N.E.2d 253 (1965)

Important as this case required nurses to use independent judgment

CASE SYNOPSIS
Defendant appealed the judgment of the Appellate Court for the Fourth District (Illinois) that upheld the jury's award of damages against defendant for alleged negligent hospital treatment.

"The court found a jury could reasonably find negligence because the nurses did not test for circulation in the leg as frequently as necessary, ***that skilled nurses would have promptly recognized those conditions, and would have known that the condition would become irreversible in hours and informed the attending physician or hospital authorities.***"
http://www.lawschoolcasebriefs.net/2013/11/darling-v-charleston-community-memorial.html

" In considering the nursing functions, as set forth herein, the question arises whether the Darling decision, by identifying the nurse, in effect, as a guardian over medical treatment, imposed a new responsibility or elaborated on an existing one. It is an accepted tenet that the nurse is required to execute all physician's orders which are legal. Failure to do so is tantamount to negligence. Conversely, carrying out a physician's order, when the patient's condition contraindicates it, may also be deemed a negligent act. ***The dividing line is in the exercise of the nurse's skilled and independent judgment.***" (Kinkela & Kinkela Jan. 1969(
http://heinonline.org/HOL/Page?handle=hein.journals/clevs18&div=11&g_sent=1&casa_token=&collection=journals

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Triage

"For example, triage—a complex cognitive nursing task designed to identify patients needing immediate medical care—has not typically been included as a component in the diagnostic process, but it can often play a de facto role, since a nurse may identify a suspected diagnosis during this process."
(Soni K, Dhaliwal G. Misleading complaint: Commentary by Krishan Soni, M.D., M.B.A., and Gurpreet Dhaliwal, M.D. 2012. [June 5, 2015]. http://webmm.ahrq.gov/case.aspx?caseID=273.).

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Broadening recognition of the hidden work of nursing

1972
New York State Nurse Practice Act was the first to include "***diagnosing and treating***" human responses to actual or potential health problems" as part of the legal domain of professional nursing.

1973
ANA Standards of Practice included ***diagnosis*** (of deviations in health from norms) as a function of professional nursing practice.

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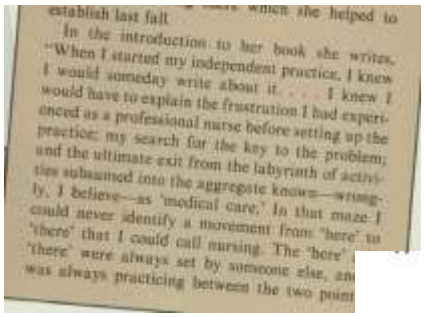
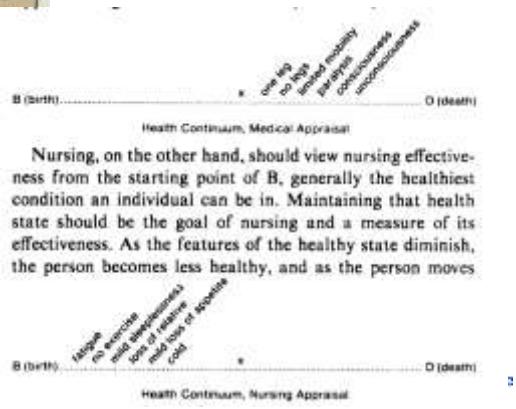
1977


establish last fall

In the introduction to her book she writes, "When I started my independent practice, I knew I would someday write about it . . . I knew I would have to explain the frustration I had experienced as a professional nurse before setting up the practice; my search for the key to the problem; and the ultimate exit from the labyrinth of activities subsumed into the aggregate known—wrongly, I believe—as 'medical care.' In that maze I could never identify a movement from 'here' to 'there' that I could call nursing. The 'here' and 'there' were always set by someone else, and I was always practicing between the two points



Critical analysis of nursing diagnosis

Powers (2002) A discourse analysis of nursing diagnosis. *Qualitative Health Research*

"The right to pronounce truth in the realm of the clinical encounter was claimed by NANDA on the basis of its imitation of the discourses of medicine and science within a linguistically constructed professional domain that was claimed to be uniquely nursing."

Diagnoses are not immutable entities in an absolutely knowable reality, but dynamic social and historical constructions (Bynum,W. F., & Nutton V. (Eds.). (1981). Theories of fever from antiquity to enlightenment (Medical History, suppl. 1). London: Welcome Institute.

" The discourse of nursing diagnosis represents the attempt of the discipline of nursing to construct and take control, physically and conceptually, of what can be called the clinical encounter, to carve out a professional turf distinct from other disciplines."

" the discourse of nursing diagnosis claims the right to pronounce truth in a domain of human experience"

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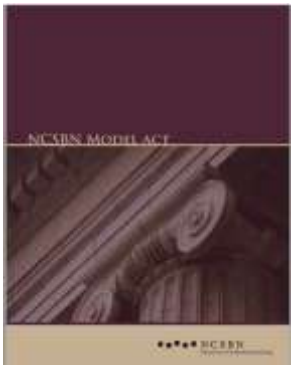

The use of the term "diagnosis" current in nurse practice acts

Section 2. Registered Nurse (RN)

a. Registered Nurse is the title given to an individual licensed to practice registered nursing.
b. The practice of registered nurses shall include:
   1. Providing comprehensive nursing assessment of the health status of patients.
   2. Collaborating with health care team to develop and coordinate an integrated patient centered health care plan.
   3. Developing the comprehensive patient centered health care plan, including:
      a. Establishing nursing diagnoses;
      b. Setting goals to meet identified health care needs; and
      c. Prescribing nursing interventions.

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Table 2. Nurse Practice Acts' Inclusion of Diagnostic Language

Yes (n = 32)	No (n = 19)
Alaska+*	Alabama (focus on "human responses to actual or potential health problems")
Arizona+	Arkansas
Colorado+*	California+* ("determination of . . . abnormal characteristics")
Connecticut+*	District of Columbia ("differentiating normal from abnormal")
Delaware*	Hawaii ("development . . . of a plan of care")
Florida+*	Idaho+ ("identification of health care problems")
Georgia*	Kentucky* (refers to ANA Standards of Practice)
Illinois+*	Massachusetts (vague: "judgments as to nursing problems")
Indiana+*	Michigan
Iowa*	Minnesota+ ("assessment of actual or potential health needs")
Kansas*	Montana+ (nursing analysis)
Louisiana*	North Carolina+ ("assessing reaction to illness and treatment")
Maine+*	Ohio ("identify patterns of human responses")
Maryland+*	Rhode Island (implied with detail)
Mississippi+*	South Carolina+* ("analysis of health status")
Missouri*	Tennessee+ ("identification of patient problems")
Nebraska+*	Texas* ("nursing care plan development")
Nevada+*	Utah+ (implied in detail)
New Hampshire+*	Virginia
New Jersey+*	
New Mexico+*	
New York+*	
North Dakota*	
Oklahoma*	
Oregon+*	
Pennsylvania+*	
South Dakota+*	
Vermont+*	
Washington+*	
West Virginia	
Wisconsin	
Wyoming+*	

Note: The 30 states marked with a cross (+) contained language legitimizing diagnosis and treatment by nurses in 1975 (Bullough, 1976). The 33 starred (*) states' practice acts contained the term "diagnosis" in 1997, while underlined states' practice acts included the concept but alternate wording (Lavin et al., 1999).

Updated review found that only Michigan and Virginia did not contain or infer diagnostic language in their nurse practice act.

Jarrin, O. (2010). Core Elements of U.S. Nurse Practice Acts and Incorporation of Nursing Diagnosis Language Core Elements of U.S. Nurse Practice Acts and Incorporation of Nursing Diagnosis Language. *International Journal Of Nursing Terminologies & Classifications, 21*(4), 166-176. doi:10.1111/j.1744-618X.2010.01162.x

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Standardized Nursing Language

Standardized nursing language

NANDA
(North American Nursing Diagnosis Association)
NIC
(Nursing Interventions Classification)
NOC
(Nursing Outcomes Classification)
Omaha System

CCC
(Clinical Care Classification)
SNOMED-CT
(Systematized Nomenclature of Medicine–Clinical Terms)
ICNP
(International Classification of Nursing Practice)

Pay wall

"Currently, many SNLs are being mapped in the reference terminology called the Systematized Nomenclature of Medicine-Clinical Terms (SNOMED-CT). As EHR vendors include SNOMED-CT in their products, this may be the vehicle needed to provide access to SNL in EHRs." Conrad et al. 2011

Conrad, D., Hanson, P. A., Hasenau, S. M., & Stocker-Schneider, J. (2012). Identifying the barriers to use of standardized nursing language in the electronic health record by the ambulatory care nurse practitioner. *Journal Of The American Academy Of Nurse Practitioners*, *24*(7), 443-451. doi:10.1111/j.1745-7599.2012.00705.x

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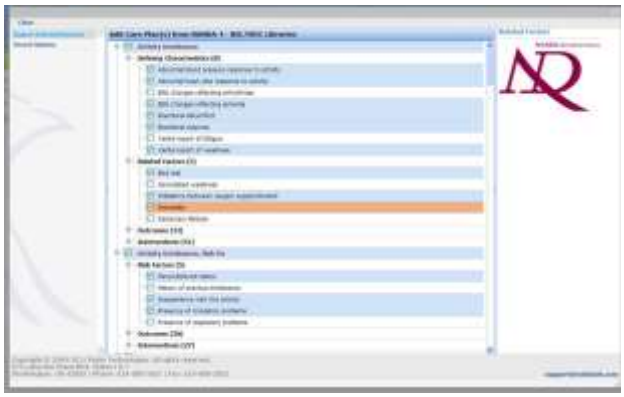
NANDA INTERNATIONAL

NANDA nursing diagnosis list 2015 - 2017



NANDA Nursing Diagnoses List 2012 – 2014

Domain 1 – Health Promotion

Domain 2 – Nutrition

Domain 3 – Elimination and Exchange

Domain 4 – Activity/ Rest

Domain 5 – Perception/ Cognition

Domain 6 – Self-Perception

Domain 8 – Sexuality

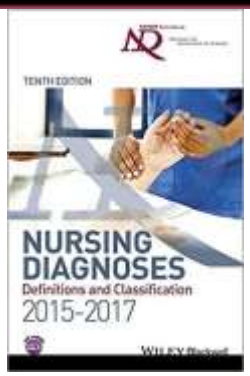
uhc

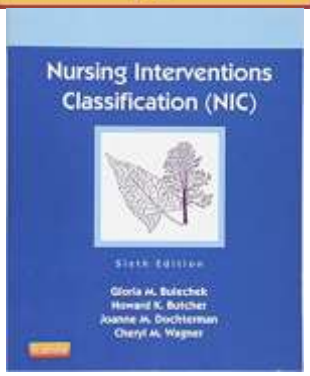
NANDA-I • NIC • NOC for Safe Patient Care

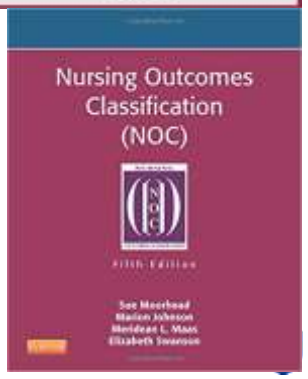
NANDA-I

NIC

NOC







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The Omaha System

Solving the Clinical Data-Information Puzzle

Domains and Problems of the Problem Classification Scheme

Environmental Domain: Material resources and physical surroundings both inside and outside the living area, neighborhood, and broader community

- Income
- Sanitation
- Residence
- Neighborhood/workplace safety

Psychosocial Domain: Patterns of behavior, emotion, communication, relationships, and development.

- Communication with community resources
- Social contact
- Role change
- Interpersonal relationship
- Spirituality
- Grief
- Mental health
- Sexuality
- Caretaking/parenting
- Neglect
- Abuse
- Growth and development

Physiological Domain: Functions and processes that maintain life.

- Hearing
- Vision
- Speech and language
- Oral health
- Cognition
- Pain
- Consciousness
- Skin
- Neuro-musculo-skeletal function
- Respiration
- Circulation
- Digestion-hydration
- Bowel function
- Urinary function
- Reproductive function
- Pregnancy
- Postpartum
- Communicable/infectious condition

Health-related Behaviors Domain: Patterns of activity that maintain or promote wellness, promote recovery, and decrease the risk of disease.

- Nutrition
- Sleep and rest patterns
- Physical activity
- Personal care
- Substance use
- Family planning
- Health care supervision
- Medication regimen

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Clinical Care Classification System (CCC)

www.clinicalcareclassification.com

Sample diagnostic labels

Activity Intolerance	Incapacity to carry out physiological or psychological daily activities
Sleep Deprivation	Lack of the normal sleep / wake cycle
Bowel Incontinence	Involuntary defecation
Fatigue	Exhaustion that interferes with physical and mental activities
Acute Pain	Severe pain of limited duration
Diarrhea	Abnormal frequency and fluidity of feces
Nausea	Distaste for food/fluid and an urge to vomit
Powerlessness	Feeling of helplessness, or inability to act
Fear	Feeling of dread or distress whose cause can be identified
Spiritual Distress	Anguish related to the spirit or soul
Vomiting	Expulsion of stomach contents through the mouth
Disuse Syndrome	Group of symptoms related to effects of immobility
Anxiety	Feeling of distress or apprehension whose source is unknown
Dying Process	Physical and behavioral responses associated with death
Decisional Conflict	Struggle related to determining a course of action
Memory Impairment	Diminished or inability to recall past events
Grieving	Feeling of great sorrow
Caregiver Role Strain	Excessive tension of one who gives physical or emotional care and support to another person or patient
Social Isolation	State of aloneness; lack of interaction with others

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INTERNATIONAL CLASSIFICATION FOR NURSING PRACTICE (ICNP®)

- ICNP Browser
- ICNP Download
- ICNP Benefits
- ICNP FAQs
- About ICNP®
- ICN Accredited Centres for ICNP® Research & Development
- ICNP® Translations
- ICNP® Catalogues
- ICNP® Research & Development
- Implementing ICNP®
- ICNP® Resources
- ICNP® Contact Us

Nursing Categories	Code	ICNP Statement (2017 Release)
and Outcomes		
Bladder/Bowel Care		
	10007718	Bowel Incontinence
	10000667	Constipation
	10000630	Diarrhoea
	10002648	Impaired Ability To Manage External Continence Device
	10005579	Impaired Ability To Manage Nephrostomy Care
	10005696	Impaired Ability To Manage Stoma Care
	10029609	Impaired Ability To Manage Urinary Catheter
	10005684	Urinary Incontinence
	10000854	Urinary Retention
	10009515	Urinary Tract Infection
Symptom Management		
	10000448	Acute Confusion
	10000477	Anxiety
	10000522	Chronic Confusion
	10041882	Dehydration
	10001235	Disorientation
	10029802	Dysphasia
	10029433	Dyspnoea
	10000695	Fatigue
	10001203	Impaired Memory
	10044238	Impaired Peripheral Tissue Perfusion
	10027226	Impaired Sleep
	10001033	Impaired Swallowing
	10029927	Inflammation
	10000859	Nausea
	10025130	Pain
	10027482	Peripheral Oedema
	10033373	Risk For Eye Infection
	10045668	Seizure
	10041824	Sleep Deprivation
	10025981	Vomiting
	10022980	Weakness
	10030128	Wheeze

International Classification for Nursing Practice

Owned and operated by the International Council of Nurses

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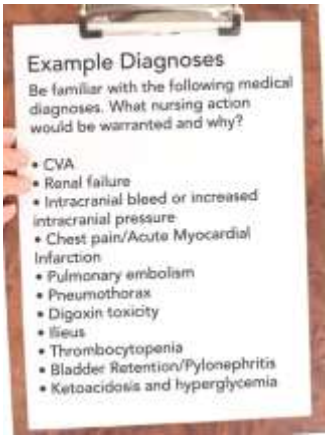
The present…..

Performance Based Development System (PBDS)



The bulk of the test will entail you watching short videos that simulate real-world clinical situations. After viewing these patient care scenes, you will then write down each step that you would take to handle these scenarios. You must record a thorough plan of action — including even the steps you might think are obvious ones needed to manage the situation. You will also be expected to write down what you think the diagnosis or primary problem is.

The test is comprised exclusively of essay questions; there are no multiple choice questions included. You will need to identify scenarios that threaten patient safety and evaluate the most effective and appropriate actions to take. For each scenario, you will be asked 4-5 questions that solicit your medical diagnosis, the

PBDS Exam Tips:

The test is looking for a medical diagnosis

Do not use a nursing diagnosis for the problem focus; they are looking for at least a recognition that a change in the patient's status has occurred. You must state what you will report to the physician as well as name the clinical change and what you believe to be the cause of the change.

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Changes in Healthcare Professions' Scope of Practice: Legislative Considerations

I. Executive Summary

This document is a result of a collaborative effort by representatives from six healthcare regulatory organizations. It has been developed to assist legislators and regulatory bodies with making decisions about changes to healthcare professions' scopes of practice.

This process gets to the heart of regulation which, according to Schmitt and Shimberg, is intended to:

1. "Ensure that the public is protected from unscrupulous, incompetent and unethical practitioners";
2. "Offer some assurance to the public that the regulated individual is competent to provide certain services in a safe and effective manner"; and
3. "Provide a means by which individuals who fail to comply with the profession's standards can be disciplined, including the revocation of their licenses."[1]

The argument for scope of practice changes should have a foundational basis within four areas: 1) an established history of the practice scope within the profession, 2) education and training, 3) supporting evidence, and 4) appropriate regulatory environment. If a profession can provide support evidence in these areas, the proposed changes in scope of practice are likely to be in the public's best interest.

2009

Developed by:

Association of Social Work Boards (ASWB)
Donna DeAngelis, LICSW, ACSW, Executive Director

Federation of State Boards of Physical Therapy (FSBPT)
William A. Hatherill, CEO
Barbara J. Safriet, Public Member and Associate Dean and Lecturer in Law, Yale Law School

Federation of State Medical Boards (FSMB)
Lisa Robin, Vice-President, Government Relations, Policy and Education

National Board for Certification in Occupational Therapy (NBCOT®)
Paul Grace, MS, CAE, President/CEO

National Council of State Boards of Nursing, Inc. (NCSBN®)
Kathy Apple, MS, RN, CAE, Executive Director

National Association of Boards of Pharmacy (NABP®)
Carmen A. Catizone, MS, RPh, DPh, Executive Director/Secretary

Overlapping scopes of practice are a reality in a rapidly changing healthcare environment. The criteria related to who is qualified to perform functions safely without risk of harm to the public are the only justifiable conditions for defining scopes of practice.

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National Academies of Sciences, Engineering, and Medicine. (2016). *Improving diagnosis in health care*. National Academies Press.

Nursing's Role in Improving Diagnosis in Health Care

Macy Project's Health Professions Education to Improve Diagnosis in Medicine
IPE curriculum

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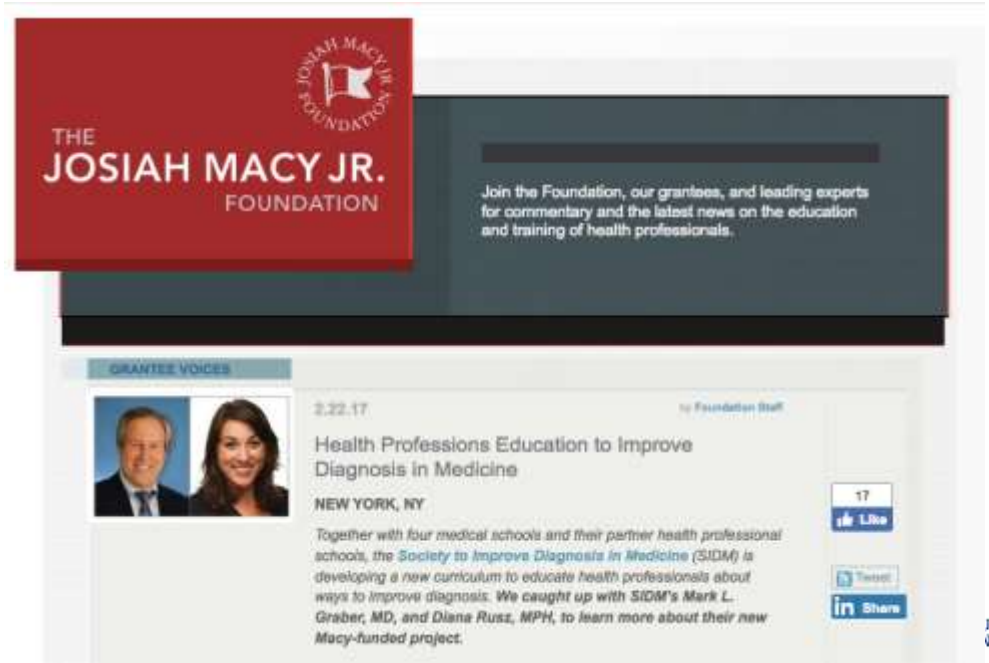

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Improving diagnosis in health care..

National Academy of Medicine reported on the scale and scope of diagnostic error in the U.S. health care system.

National Academies of Sciences, Engineering, and Medicine. (2016). *Improving diagnosis in health care*. National Academies Press.

Categories of causes of preventable adverse events

- Errors of commission,
- Errors of omission,
- Errors of communication,
- Errors of context,
- ***Diagnostic errors***

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Definition of diagnostic error

The failure to…

(a) establish an accurate and timely explanation of the patient's health problem(s)

or

(b) communicate that explanation to the patient

The Path to Improve Diagnosis and Reduce Diagnostic Error. Available from: https://www.ncbi.nlm.nih.gov/books/NBK338589/

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Diagnostic Process

Where errors can occur….

1. Encounter that involves clinician decision-making and test/referral ordering based on details of patient presentation;
2. Performance and interpretation of diagnostic tests;
3. Follow-up and tracking of diagnostic information over time;
4. Subspecialty and referral-specific issues;
5. Patient-related care-seeking and adherence processes.

Singh, H., & Weingart, S. N. (2009). Diagnostic errors in ambulatory care: dimensions and preventive strategies. *Advances in health sciences education*, *14*(1), 57-61.

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Society to Improve Diagnosis in Medicine

http://www.improvediagnosis.org/default.asp?

First, a brief introduction to SIDM and their work….

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Clinical Reasoning

The Clinical Reasoning Toolkit is full of resources to support clinicians in developing their Clinical Reasoning Skills. It also includes specific information for those teaching the next generation of physicians and other members of the clinical team. Learn more.

Checklists

There are a wealth of checklists—which are used today in the medical field, and many other industries—that are specifically meant to ensure an error-free cognitive process for diagnosis. Learn more.

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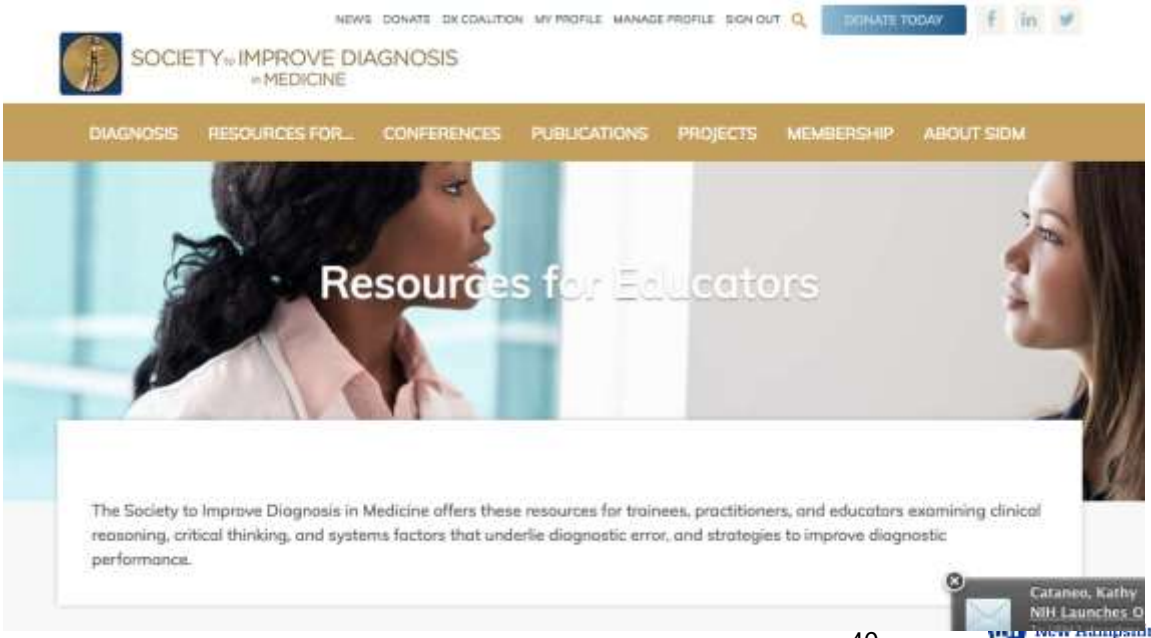

Catanese, Kathy
NIH Launches O

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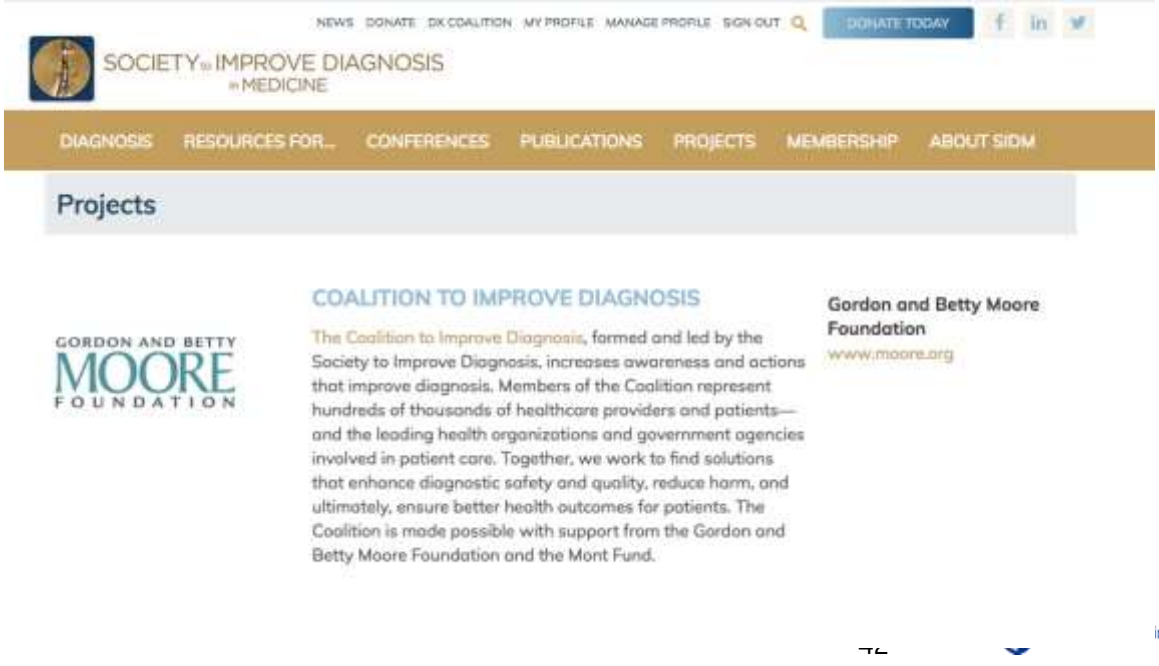
SOCIETY to IMPROVE DIAGNOSIS in MEDICINE
DIAGNOSIS RESOURCES FOR... CONFERENCES PUBLICATIONS PROJECTS MEMBERSHIP ABOUT SIDM
Clinical Reasoning Toolkit
Diagnostic Reasoning is a fundamental skill for any clinician.
The Clinical Reasoning Toolkit presents a collection of go-to resources for clinicians endeavoring to develop their clinical reasoning skills. It also includes a special section just for those teaching the next generation of physicians and other members of the clinical team.
Assessment of Reasoning Tool
Errors in clinical reasoning are central factors in many diagnostic errors.
The Society to Improve Diagnosis in Medicine has developed a straightforward Assessment of Reasoning Tool to support educators in assessing a learner's clinical reasoning skills during patient presentations.
Getting It Right- American College of Physician Cases to Improve Diagnosis
These learning cases are for practicing physicians, encouraging them to think around diagnostic decision-making, how diagnostic errors may affect both patients and physicians in their daily practice of medicine, and how errors can be mitigated by physicians. The cases were developed by the American College of Physicians in collaboration with SIDM. The activity offers both CME credit and American Board of Internal Medicine Maintenance of Certification points upon completion.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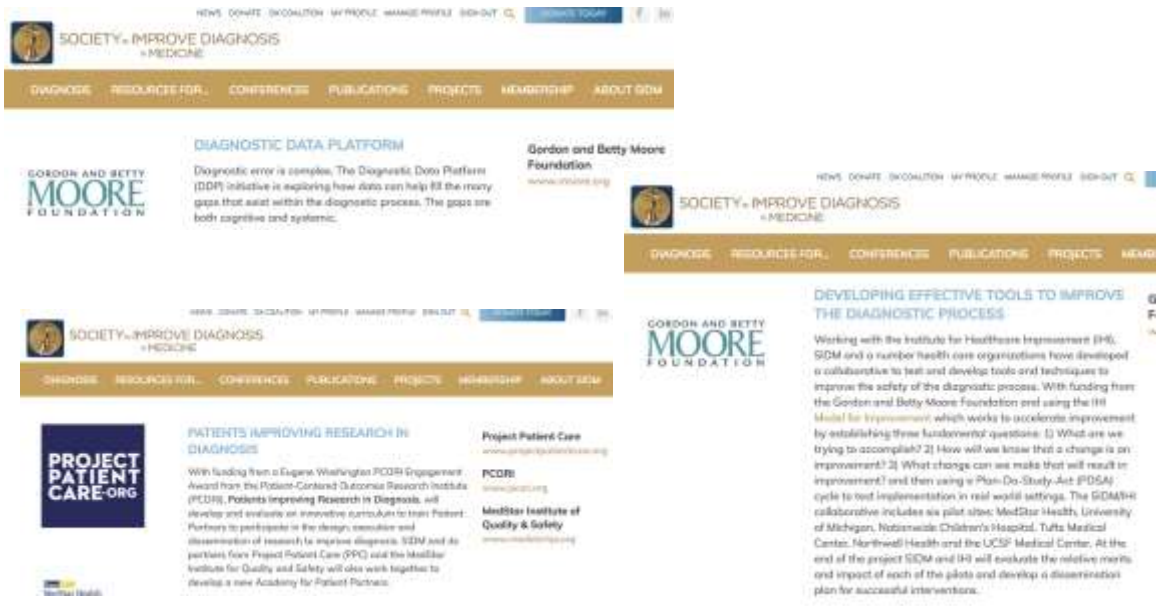
Projects
GORDON AND BETTY MOORE FOUNDATION
COALITION TO IMPROVE DIAGNOSIS
The Coalition to Improve Diagnosis, formed and led by the Society to Improve Diagnosis, increases awareness and actions that improve diagnosis. Members of the Coalition represent hundreds of thousands of healthcare providers and patients—and the leading health organizations and government agencies involved in patient care. Together, we work to find solutions that enhance diagnostic safety and quality, reduce harm, and ultimately, ensure better health outcomes for patients. The Coalition is made possible with support from the Gordon and Betty Moore Foundation and the Mont Fund.
Gordon and Betty Moore Foundation
www.moore.org



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Improve access to diagnostic tests

Provide systematic feedback to clinicians about their diagnosis

Encourage policies that support primary care

Improve diagnostic reasoning

Potential Interventions to Reduce Global Burden of Diagnostic Errors

Improve information technology

Involve patients

Optimize diagnostic strategies in primary care

Develop methods to identify and learn from diagnostic errors

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Key concepts in diagnostic reasoning for interprofessional practice

Dual process reasoning
Expertise development
Context-specificity

Thanks to Croskerry, P., Cosby, K., Graber, M. L., & Singh, H. (2017). *Diagnosis: Interpreting the Shadows*. CRC Press.

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Diagnostic work = Development of an argument

Uses logical reasoning
Deductive logic
Inductive logic
Abductive logic

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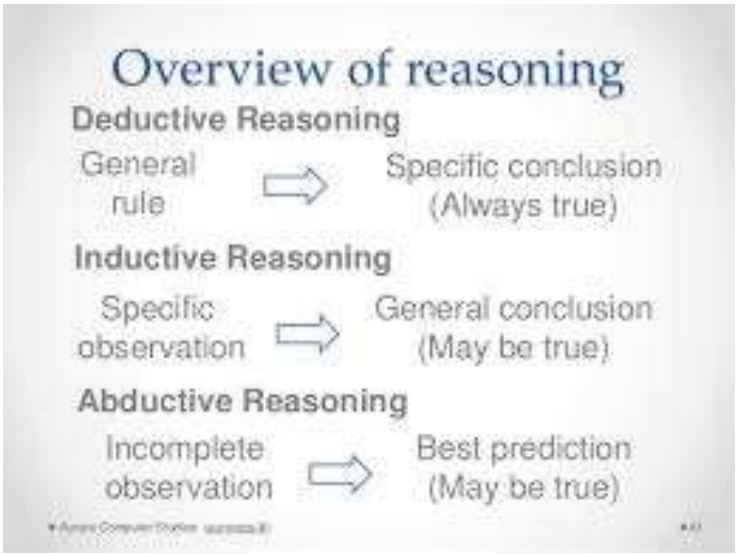
Features	Deductive	Inductive	Abductive
Accuracy	Certain	Probable	Plausible
Rules	Formal, fixed	Generative	Generative
Characteristics	Conclusions true given premise	Weighs possibilities based on probability	Considered tentative, even skeptical. Willing to be revised with new info

More than "knowing" is needed.

Doing requires interaction and interpretation.

Work as imagined and work as realized.



Knowing that and knowing how

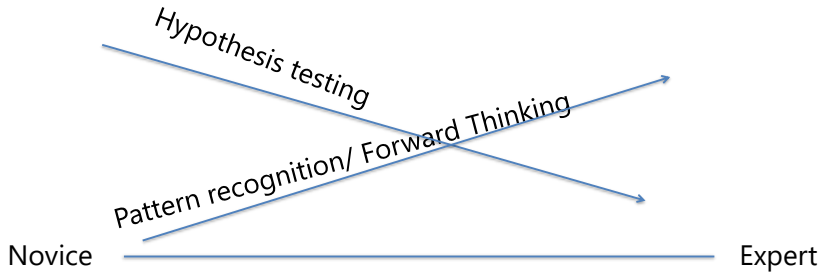
- Objective based teaching must move to competency based learning
- Need training in thinking and reasoning AND making decisions based on reasoning
- Minimize errors of ignorance AND errors of implementation.

Cognitive Factors Related to Dx Error

- Knowledge and experience
- Clinical reasoning and decision-making skills
  - reflective practice
  - active metacognitive review
- Cognitive 'help'
  - Electronic records integrated decision support,
  - Informaticians
  - Facilitating access to information, second opinions and specialists.

Graber, M. L., Kissam, S., Payne, V. L., Meyer, A. N., Sorensen, A., Lenfestey, N., ... & Singh, H. (2012). Cognitive interventions to reduce diagnostic error: a narrative review. *BMJ Qual Saf*, bmjqs-2011.

Problem Solving Maturation



Bordage, G., & Lemieux, M. (1991). Semantic structures and diagnostic thinking of experts and novices. Acad Med, 66(9 Suppl), S70-S72.

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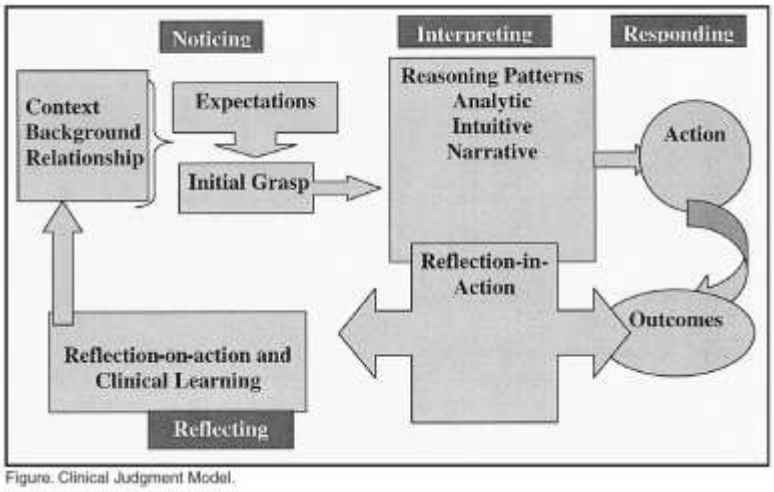

Figure. Clinical Judgment Model.

So how does this all come together?

Thinking like a nurse

Tanner, C. A. (2006). Thinking like a nurse: A research-based model of clinical judgment in nursing. *Journal of nursing education*, *45*(6).

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Teaching Toward Expertise

Select educational strategies to teach and assess diagnostic reasoning and improve diagnostic accuracy and safety.

To achieve pattern recognition/ forward thinking…

- Process information
  - Rely on multiple symptoms to identify syndromes
- Build accurate and robust illness scripts
- Compare and contrast
  - Teaches key features
  - Building blocks of memory network
- Prioritize differential diagnoses

Abductive reasoning

Incomplete observations → Best prediction (may be true)

How Young Doctors Think: Teaching Clinical Decision Making
Catherine R. Lucey MD
https://www.youtube.com/watch?v=SOesiCMSukI

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Dual Process Models of Thinking: System I and System II

Abductive reasoning

- **System I**
  - automatic, unconscious
  - intuitive, heuristic
  - Long-term, associative memory of essentially limitless capacity
  - Memories are retrieved based on the strength of their association with the new information

- **System II**
  - controlled, conscious, and effortful
  - reflective, analytic
  - Working memory of limited capacity in which all computations occur
  - Abstract and normative
  - Consistent with logical rules so it places a heavy burden on one's working memory.

Kahneman Thinking Fast and Slow

"Knowledge matters. "
"Even if some proportion of errors arise from cognitive biases, the resolution of errors also involves the application of clinical knowledge, which may underlie the initial mistake."

Norman, G. R., Monteiro, S. D., Sherbino, J., Ilgen, J. S., Schmidt, H. G., & Mamede, S. (2017). The causes of errors in clinical reasoning: cognitive biases, knowledge deficits, and dual process thinking. *Academic Medicine*, *92*(1), 23-30.

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Problems with rationality

Processing problem

Cognitive miserliness

- Minimizes cognitive effort
- Accepting things at face value
- Insufficient breadth and depth
- Unquestioning attitude

Mindware gaps

Content issue

- Ignoring alternative hypotheses
- Knowledge deficits
- Impaired scientific thinking
- Impaired probability thinking

Mindware contamination

- Egocentric thinking
- Cognitive biases
- Cultural conditioning
- Illogical reasoning

Content issue

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What is a heuristic?

Mental shortcuts

"…cognitive strategies or mental shortcuts that are automatically and unconsciously employed—are particularly important for decision making."

"Heuristics can facilitate decision making but can also lead to errors When a heuristic fails, it is referred to as a cognitive bias."

Expertise is associated, not with a single basic representation but with multiple coordinated representations in memory, from causal mechanisms to prior examples

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Draft Competency Grid

Curriculum to Improve Diagnosis

Competency Summary List – RN Specific Grid

Introduction: The Curriculum to Improve Diagnosis is organized into three overall domains: **Individual, System-Related, and Team-Based**. These are generic competency concepts applicable to each member of the interprofessional team, and should be adapted to each profession's specific roles.

An accompanying document will illustrate generic milestones and learning objectives for each of these concepts, with relevant references.

Individual competencies relate to the knowledge, skills and attitudes that a health care professional must demonstrate on an individual level in order to contribute in their specific role to the diagnostic process.

Team-based competencies relate to the knowledge, skills, and attitudes that a health care professional must demonstrate in collaboration as a member of the diagnostic team.

Systems-based competencies relate to the knowledge, skills, and attitudes that a health care professional must demonstrate in relation to how the diagnostic process operates within a particular health care system.

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Individual competencies for diagnosis (I-components) relate to the knowledge, skills and attitudes that a health care professional must demonstrate on an individual level in order to contribute in their specific role to the diagnostic process.

Demonstrate clinical reasoning to arrive at a justifiable diagnosis (an explanation for a health-related condition)

I-1. Accurately and efficiently collect key clinical findings needed to inform diagnostic hypotheses.
Use these tools appropriately and efficiently in the diagnostic process: Effective interpersonal communication skills, history-taking, the physical examination, and record review; diagnostic testing; and the electronic health record and health IT resources

I-2. Formulate, or contribute to, an accurate problem representation expressed in a concise summary statement that includes essential epidemiological, clinical, and psychosocial information.

I-3. Produce, or contribute to, a correctly prioritized, relevant differential diagnosis, including can't miss diagnoses.

I-4. Explain and justify the prioritization of the differential diagnosis by comparing and contrasting the patient's findings and test results with accurate knowledge about prototypical or characteristic disease manifestations and atypical presentations, and considering pathophysiology, disease likelihood, and clinical experience.

I-5. Use decision support tools, including point-of-care resources, checklists, consultation, and second opinions to improve diagnostic accuracy and timeliness

I-6. Use reflection, surveillance, and critical thinking to improve diagnostic performance and mitigate detrimental cognitive bias throughout the clinical encounter. Discuss and reflect on the strengths and weaknesses of cognition, the impact of contextual factors on diagnosis, and the challenges of uncertainty. Demonstrate awareness of atypical presentations, information that is missing, and key findings that don't 'fit'.

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Team-based competencies for diagnosis (T-components)

T. Partner effectively as part of an interprofessional diagnostic team. Communicate effectively and solicit information from all members of the team (including the patient and family) to create a shared mental model of a patient's illness and the plan for diagnostic evaluation.

T-1. Engage and collaborate with patients and families, in accordance with their values and preferences when making a plan for diagnostic evaluation. Listen actively, encourage questions, and be alert to new or changing information. Explain the diagnostic process, including the patient's and family's role in helping to identify the most likely diagnosis. Share appropriately when diagnostic uncertainty exists.

T-2. Collaborate with other healthcare professionals (including nurses, physicians, physician assistants, radiologists, laboratory professionals, pharmacists, social workers, physical therapists, medical librarians, and others) and communicate effectively throughout the diagnostic process. Acknowledge and challenge authority gradients, especially between clinicians and patients\families, constructively.

T-3. Apply effective strategies at transitions of care to facilitate accurate and sufficient information transfer about the diagnosis, including any pending workup and areas of uncertainty. Close the loop on test result communication and clarify expectations with the team for test result follow-up.

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System-related competencies for diagnosis (S-components)

S. Identify and understand the systems factors that facilitate and contribute to timely, accurate diagnoses and error avoidance.

S-1. Discuss how human factors contribute to diagnostic safety and error by identifying how the work environment influences human performance. Take steps to mitigate common systems factors that detract from diagnostic quality and safety.
Use local resources (including people, teams and technology, especially the electronic health record) effectively and efficiently to optimize patients' access to care, diagnostic testing services, and appropriate experts for consultation.

S-2. Advance a culture of diagnostic safety that encourages open dialogue and continuous learning from analysis and discussion of excellent diagnostic performance, near misses and errors.
Give and receive feedback at an individual and team level to improve subsequent diagnostic performance
S-3. Disclose diagnostic errors and missed opportunities transparently and in a timely manner to patients, families, team members, supervisors, and appropriate quality and risk management staff.

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Experience alone does not equal expertise

Experience can lead to overconfidence, burnout, complacency, decreased motivation, and….

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Experience, competence, expertise

- First phase- learning basic schemas
- Second phase- experiential gradual refinement of schemas

1. Application of science to clinical problems.
2. Encapsulated knowledge
3. Illness scripts- match to pt presentation then instantiated in the course of script verification.

Reflective competence is required

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Dual Process Theory Training

Bias innoculation

Be more skeptical

Cognitive tutoring systems

Structured data acquisition

Metacognition, mindfulness, reflection

Specific instruction in logic, argumentation, research design

Forcing functions

Disconfirming strategies- rule out worst case

Get more information – we ignore what we don't know

Illness scripts

"From didactic presentations, role modeling, case discussions, and clinical exposure, novices integrate networks of information, associative links, and memories of real patient encounters to form unique clusters of information for each diagnosis."

Ilgen, J. S., Humbert, A. J., Kuhn, G., Hansen, M. L., Norman, G. R., Eva, K. W., ... & Sherbino, J. (2012). Assessing diagnostic reasoning: a consensus statement summarizing theory, practice, and future needs. Academic Emergency Medicine, 19(12), 1454-1461.

Components of Illness Script	Community Acquired Pneumonia
Pathophysiology	· Infection of the lower respiratory tract · Most commonly caused by Streptococcus pneumoniae
Epidemiology	Increased risk with: · Age · Post upper respiratory tract viral infection · Structural lung disease · Immunodeficiency
Time course	· Acute: Days · Progressively worsens if not treated
Salient Symptoms and Signs	· Fever · Cough · Shortness of breath · Tachycardia · Tachypnea · Hypoxemia
Diagnostics	Labs and imaging: · Leukocytosis · Lobar infiltrate on chest x-ray · Bacteria in sputum or blood cultures
Treatment	Antibiotics typically lead to improvement over days

Illness scripts

Encodes a predictive value for each feature of the disease, allows for the estimate of the likelihood of a diagnosis when that feature is present or absent. Example: The absence of a fever does not exclude the diagnosis of CAP.

Emphasizes distinguishing characteristics whose presence or absence significantly alters the likelihood of the diagnosis, and helps differentiate it from another related diagnosis. Example: A lobar infiltrate on chest x-ray without cardiomegaly or cephalization of vessels is highly suggestive of CAP and makes congestive heart failure less likely

Look-a-likes to consider when an illness script of a particular diagnosis is invoked. Example: Chronic obstructive pulmonary disease (COPD) exacerbation and congestive heart failure resemble CAP.

http://www.sgim.org/web-only/clinical-reasoning-exercises/illness-scripts-overview

If the student/clinician problem is…

Catherine R. Lucey, MD
https://www.youtube.com/watch?v=SOesiCMSukI

- Can't do a problem list?
  - Inattentiveness
- Can't process or develop illness script?
  - Compare and contrast thinking
  - Knowledge base
- Can't prioritize
  - Factual knowledge (incorrect illness script)
  - Lack of understanding of key features (correct illness script, can't match)
- Encourage autocorrection
- What does that disease typically look like?
  - Use illness script format
  - Force use of processed descriptors
- How does that compare with this patient?
  - How does this explain this patient's sx?
- Stress key and rejecting features
  - What would have to be present to make this a highly likely diagnosis?

Resources for clinicians http://www.improvediagnosis.org/page/clinicalreasoning

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The diagnostic process as a dynamic team-based activity

NAM Goal 1: *Facilitate more effective teamwork in the diagnostic process among health care professionals, patients, and their families*

Recommendation 1a: In recognition that the diagnostic process is a dynamic team-based activity, health care organizations should ensure that health care professionals have the appropriate knowledge, skills, resources, and support to engage in teamwork in the diagnostic process. To accomplish this, they should facilitate and support:

- Intra- and interprofessional teamwork in the diagnostic process.
- Collaboration among pathologists, radiologists, other diagnosticians, and treating health care professionals to improve diagnostic testing processes.

Graber, M. L., Rusz, D., Jones, M. L., Farm-Franks, D., Jones, B., Gluck, J. C., ... & Dotseth, M. (2017). The new diagnostic team. Diagnosis, 4(4), 225-238.

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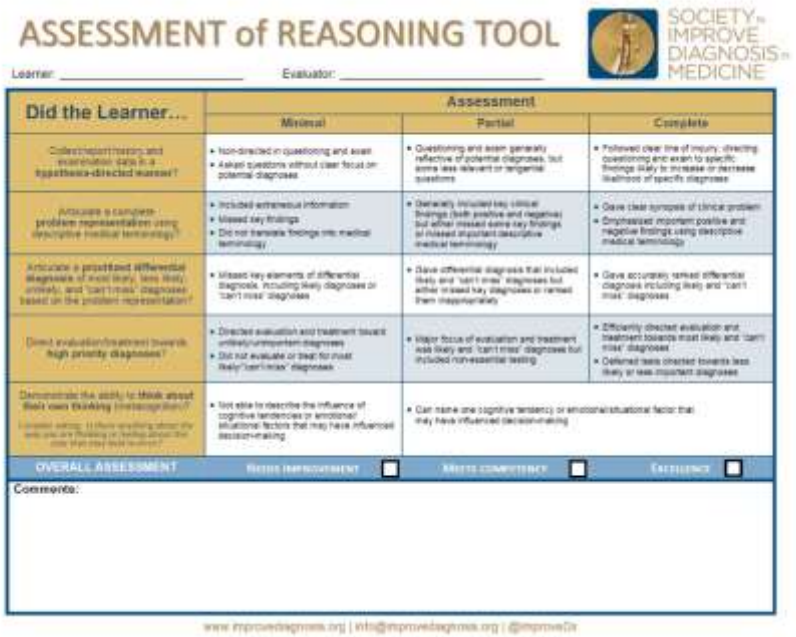
https://www.improvediagnosis.org/page/art



Developed by the Education Committee of the Society to Improve Diagnosis in Medicine (SIDM)

May be freely used with attribution.

https://www.improvediagnosis.org/page/ART

TABLE 2
Lasater Clinical Judgment Rubric

Dimension	Exemplary	Accomplished	Developing	Beginning
Effective noticing involves:				
Focused observation	Focuses observation appropriately; regularly observes and monitors a wide variety of objective and subjective data to uncover any useful information	Regularly observes and monitors a variety of data, including both subjective and objective; most useful information is noticed; may miss the most subtle signs	Attempts to monitor a variety of subjective and objective data but is overwhelmed by the array of data; focuses on the most obvious data, missing some important information	Confused by the clinical situation and the amount and kind of data; observation is not organized and important data are missed, and/or assessment errors are made
Recognizing deviations from expected patterns	Recognizes subtle patterns and deviations from expected patterns in data and uses these to guide the assessment	Recognizes most obvious patterns and deviations in data and uses these to continually assess	Identifies obvious patterns and deviations, missing some important information; unsure how to continue the assessment	Focuses on one thing at a time and misses most patterns and deviations from expectations; misses opportunities to refine the assessment
Information seeking	Assertively seeks information to plan intervention; carefully collects useful subjective data from observing and interacting with the patient and family	Actively seeks subjective information about the patient's situation from the patient and family to support planning interventions; occasionally does not pursue important leads	Makes limited efforts to seek additional information from the patient and family; often seems not to know what information to seek and/or pursues unrelated information	Is ineffective in seeking information; relies mostly on objective data; has difficulty interacting with the patient and family and fails to collect important subjective data
Effective interpreting involves:				
Prioritizing data	Focuses on the most relevant and important data useful for explaining the patient's condition	Generally focuses on the most important data and seeks further relevant information but also may try to attend to less pertinent data	Makes an effort to prioritize data and focus on the most important, but also attends to less relevant or useful data	Has difficulty focusing and appears not to know which data are most important to the diagnosis; attempts to attend to all available data
Making sense of data	Even when facing complex, conflicting, or confusing data, is able to (a) note and make sense of patterns in the patient's data, (b) compare these with known patterns (from the nursing knowledge base, research, personal experience, and intuition), and (c) develop plans for interventions that can be justified in terms of their likelihood of success	In most situations, interprets the patient's data patterns and compares with known patterns to develop an intervention plan and accompanying rationale; the exceptions are rare or in complicated cases where it is appropriate to seek the guidance of a specialist or a more experienced nurse	In simple, common, or familiar situations, is able to compare the patient's data patterns with those known and to develop or explain intervention plans; has difficulty, however, with even moderately difficult data or situations that are within the expectations of students; inappropriately requires advice or assistance	Even in simple, common, or familiar situations, has difficulty interpreting or making sense of data; has trouble distinguishing among competing explanations and appropriate interventions, requiring assistance both in diagnosing the problem and developing an intervention

Lasater, K. (2007). Clinical judgment development: Using simulation to create an assessment rubric. *Journal of nursing education*, *46*(11), 496-503.

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Context specificity

Diagnostic reasoning constructs must be considered in the context of a dynamic environment.

Situated cognition is a theory that posits that knowing is inseparable from doing by arguing that all knowledge is **situated** in activity bound to social, cultural and physical contexts.

interaction among the clinician, patient, family, environment

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What is a heuristic?

Mental shortcuts

"…cognitive strategies or mental shortcuts that are automatically and unconsciously employed—are particularly important for decision making."

"Heuristics can facilitate decision making but can also lead to errors. When a heuristic fails, it is referred to as a cognitive bias."

National Academies of Sciences, Engineering, and Medicine. (2016). *Improving diagnosis in health care*. National Academies Press

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Cause of most diagnostic errors

- Cognitive biases (maybe…?)
- Failed heuristics (mental shortcuts)
- Lack of knowledge

- Leads to failure to generate an adequate DDx
- Single most common reason for diagnostic error "I just didn't think of it."

- Anchoring bias
  - overly relying on the initial information received or initial diagnosis considered.
- Context errors
- Premature closure of the diagnostic process.

Ely, J. W., & Graber, M. L. (2016). Preventing diagnostic errors in primary care. Am Fam Physician, 94(6), 426-432.

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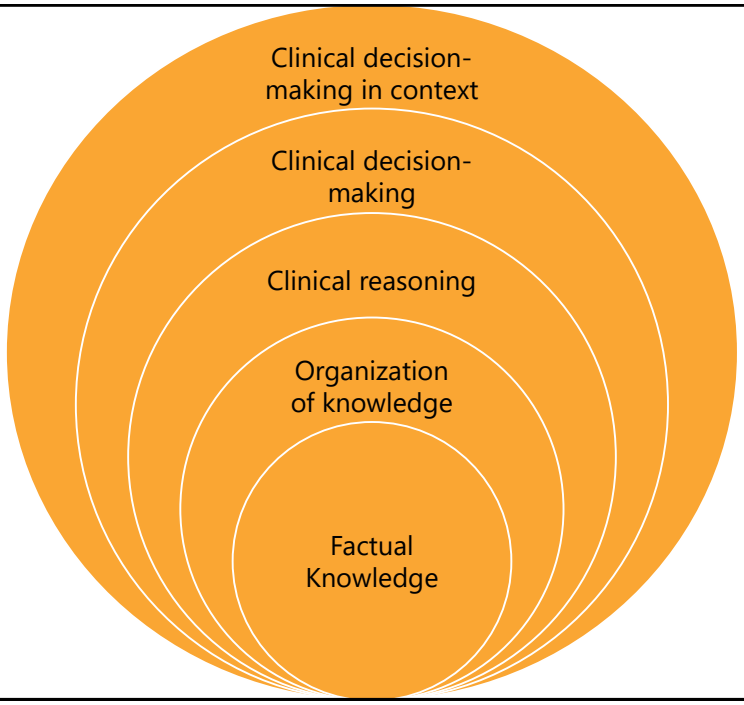
Bias/Heuristic	
Anchoring	Clinician "anchors" on early piece of data, doesn't adjust working diagnosis with new data
Availability	Belief that what comes to mind easily/quickly is the most likely diagnosis
Base rate neglect	Pretest probability/demographic likelihood of diagnosis in this population not accounted for
Blind obedience	Undue emphasis on expert opinion or diagnostic tests that may be misleading/wrong
Confirmation	Tendency to look for evidence that confirms working diagnosis, neglect of refuting evidence
Framing	The way situation is described/constructed influences how it is seen
Premature closure	Reasoning stops once working diagnosis is established
Visceral bias	Clinician's feelings about patient or diagnosis influence clinical reasoning

So what do we

- **Multipronged approach**
- Increase clinical knowledge base→ type I and
  - Continuous learning from cases
- Increase awareness of biases→ Reflection, training, IAT
- → Use awareness to trigger diagnostic time-out
  - What else could this be?
  - What data is not accounted for?
  - What additional information do I need?
  - Would a tool be helpful (DDx generator)?



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Construct under-representation in diagnostic reasoning: Workplace based assessments

Diagnostic reasoning is NOT a generalizable skill

Content-specific

Competence diagnosing cause of dyspnea

Competence diagnosing cause of jaundice

Context-specific ≠

Competence diagnosing cause of dyspnea in adult

Competence diagnosing cause of dyspnea in infant

-

≠

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Tools for assessing clinical reasoning

Standardized

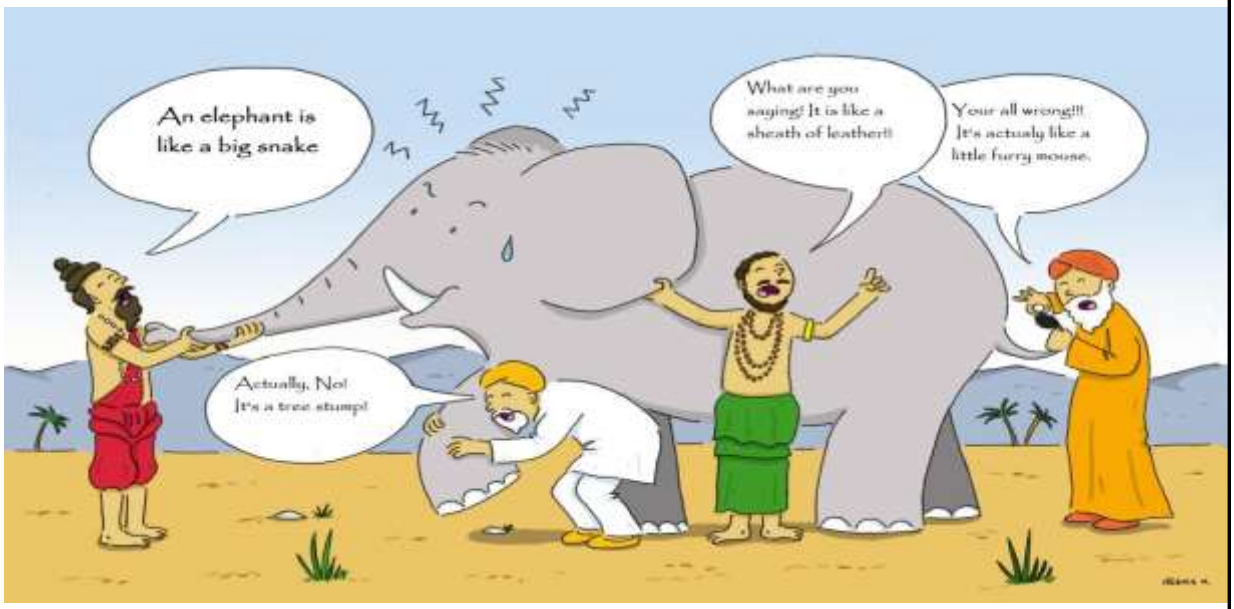
MCQ
Key Features
Extended Matching Items
Script Concordance
Clinical reasoning problems

Concept Maps

Short Essay
Oral Exam
OSCE
Hi-fidelity simulation
Clinical integrated puzzles

Workplace-Based

Assessment of Reasoning Tool
Chart-stimulated recall/review
Oral case presentation
Direct observation of clinical skills
Global assessments



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Interprofessional strategies to minimize diagnostic error

- Engage the patient as well as other health care providers as partners
  - Honestly discuss diagnostic uncertainty and how to follow-up if not improved or worsen
- Use second opinions from peers and consultants
- Use diagnostic checklists
  - Diagnostic time-out.
    - See next slide / exemplar at Ely, J. W., & Graber, M. L. (2016). Preventing diagnostic errors in primary care. Am Fam Physician, 94(6), 426-432.

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Checklist to Help Prevent Diagnostic Errors

❑ Did I just accept the first diagnosis that came to mind without considering other possibilities? (anchoring bias)
❑ Did the patient come with a diagnosis that may not be correct?
❑ Are there data that should be reviewed before the patient leaves (e.g., information from old records, family members, ambulance crews, or previous clinicians)?
❑ Is there anything that doesn't fit or doesn't seem consistent with the diagnosis?
❑ Did I take the history, do the physical examination, and review the radiographs myself?
❑ Was the patient seen recently for the same problem? If so, what was done, and what has changed since then?
❑ Are there external pressures (e.g., physician fatigued, distracted, or angry; patient drunk or hostile; time pressure (behind schedule); "quitting time" phenomenon (end of shift or 5:00 p.m. on a Friday)?

See Youtube for video

https://www.youtube.com/watch?v=uHpieuyP1w0

Ely, J. W., & Graber, M. L. (2016). Preventing diagnostic errors in primary care. Am Fam Physician, 94(6), 426-432.

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2. Kavanagh, J. M., & Szweda, C. (2017). A Crisis in Competency: The Strategic and Ethical Imperative to Assessing New Graduate Nurses' Clinical Reasoning. *Nurs Educ Perspect, 38*(2), 57-62. doi:10.1097/01.NEP.0000000000000112
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Thank you!

Questions?

Gene Elizabeth Harkless DNSc, APRN, FNP-BC, CNL, FAANP
Chair and Associate Professor
Department of Nursing
University of New Hampshire
Durham, NH 03824
603 862 2285 geh@unh.edu

University of New Hampshire