

Chapter 1

CLINICAL DECISION MAKING

Learning Objectives:

- To ensure that a thorough and efficient decision-making processes are followed during the time of providing emergency medical care
- To appreciate the importance of maintaining knowledge-based decision making
- To identify deficiencies in decision making and take steps to correct and improve
- To identify and employ strategies to minimize error

INTRODUCTION

Practice of emergency medicine requires rapid and most appropriate decisions to institute appropriate treatment and improve patient outcome. It demands proficiency in the following areas:

- Thorough and efficient data gathering
- Appropriate diagnostic approach
- Management decision making
- Most cost-effectiveness

DIAGNOSTIC APPROACH

Medical inquiry (data gathering): Data gathering must be done through

- History taking, examination, diagnostic testing
- Ensure not to jump to technology until it is a must or clinical judgment is equivocal
- Clinical decision making: It is of utmost importance to utilize the above data to evaluate, diagnose, and manage.

One thing we do know about decision-making is that experienced clinicians perform better than novices i.e., practice at clinical decision-making appears to improve performance. This fits with what we know about error type and provider proficiency. Over time there are progressively fewer knowledge-based errors. After an appropriate learning period, usually in the order of about five to ten years, rule acquisition is optimal and thereafter rule-based errors go into decline. The downside of becoming an expert is that skill-based errors gradually increase to a greater or lesser extent.

The most reasonable explanation for the improvements that we see over time is experience per se i.e., it does not appear that the decision-making of experienced clinicians improves because they have been reading about, or taking courses on critical thinking or decision-making. In fact, there is very little emphasis in medical training on decision-making, and precious few postgraduate or Continuing Medical Education courses on the topic. Most clinicians have never taken such courses, and only a handful ever read articles on decision-making.

VARIOUS MENTAL BIASES OR DEFILEMENTS

Cognitive biases or Cognitive Contributions to Diagnostic Error

Avoid jumping to a conclusion- Everyone is prone to taking mental shortcuts when thinking through difficult problems, and experts say physicians are no exception. Here are a few of the cognitive biases that can lead to diagnostic errors.

- **Anchoring bias:** Locking on to salient features in a patient's initial presentation too early in the diagnostic process and failing to adjust in light of later information.
- **Availability bias:** Judging things as being more likely if they readily come to mind; for example, a recent experience with a disease may increase the likelihood of it being diagnosed.
- **Confirmation bias:** Looking for evidence to support a diagnosis rather than looking for evidence that might rebut it.
- **Diagnosis momentum:** Allowing a diagnosis label that has been attached to a patient, even if only as a possibility, to gather steam so that other possibilities are wrongly excluded.

- **Overconfidence bias:** Believing we know more than we do, and acting on incomplete information, intuitions and hunches.
- **Premature closure:** Accepting a diagnosis before it has been fully verified.
- **Search-satisfying bias:** Calling off a search once something is found.

Systemic Flaws or System-Related Contributions to Diagnostic Error

Beyond the doctor's control – Nearly two-thirds of missed or delayed diagnoses involve systems-related problems that can make it harder for physicians to reach the correct diagnosis. Here are areas of failure and the problems they represent:

- **Policies and procedures:** Lack of protocols exist to ensure appropriate follow-up.
- **Inefficient processes:** There are unnecessary delays in scheduling clinic visits or procedures.
- **Teamwork:** Needed information or skills go unshared.
- **Management:** Studies are not read in time; x-rays are lost or misplaced.
- **Care coordination:** Consult requests are lost or not acted upon promptly.
- **Equipment:** Test instruments are faulty, mis-calibrated or unavailable.
- **Supervision:** There is a failure to oversee trainees properly.
- **Expertise:** Required specialists are not available in a timely fashion.

Although diagnostic error can never be eliminated, studies have identified the common causes of diagnostic error in medicine. The high prevalence of **system-related** factors offers the opportunity to reduce diagnostic errors if health care institutions accept the responsibility of addressing these factors. Devising strategies for reducing **cognitive errors** is a more complex problem. To conclude, given below is the key messages for health workers in the emergency rooms.

Etiology of Diagnostic Error:

No-fault errors

Masked or unusual presentation of disease
Patient-related error (uncooperative, deceptive)

System-related errors

Technical failure and equipment problems
Organizational flaws

Cognitive errors

Faulty knowledge
Faulty data gathering

The Diagnostic Approaches Employed Are:

- Medical inquiry (data gathering) through proper history taking, examination, diagnostic testing.
- Clinical decision making through utilization of data to evaluate, diagnose, and manage.

TYPICAL DECISIONS

Typical decisions occur in the following steps:

1. Triage: accuracy of triaging matters. Over-triaging or under-triaging will both hamper the treatment and outcome.
2. Diagnosis: based on the history, clinical examination and diagnostic testing supplemented by the available laboratory and radiological tests. Sometimes, diagnosis needs to be assumed due to complicated presentation.
3. Treatment: Treatment should include initial resuscitation followed by definitive care based on a most likely working diagnosis.

4. Disposition: could be further observation or admission for further management, or discharge home or refer for better care.

Decision Making Processes

- Pattern recognition
- Rules and algorithms
- Differential diagnoses
- Event-driven decision making

Pattern Recognition

- Disease-related facts may be memorized without knowing how to use them
- Pattern recognition: process of linking disease-specific facts from history and physical exam.
 - Lowest level of clinical decision making
 - “Skill-based”.
 - Operates “automatically” with experience.

Rules and Algorithms

- Useful when faced with atypical presentations or unusual symptoms
- Assist with classifying signs/symptoms into previously defined diagnostic and treatment groups.
- Algorithms provide rules of action useful during high-stress situations (e.g. ACLS, ATLS).
- Appropriate use of rules and algorithm-based action steps minimize human error.

DIFFERENTIAL DIAGNOSES

- Requires highest level of clinical decision making.
- Involves development of hypotheses.
- Supports use of medical knowledge to create new solutions.
- Cues from history, exam, and testing.
- Hypothesis (differential diagnosis) generation.
- Hypothesis evaluation & refinement.
 - Data gathering to confirm/exclude hypothesis.
 - Add new diagnostic hypothesis based on new data.
 - Hypothesis verification.
 - Choose and verify most likely diagnosis.

Benefits/strategies:

- Consider uncommon diagnoses
- Avoid premature judgement
- Avoid labeling with diagnosis that does not “fit”.

Event-Driven Process

- Treatment before definitive dx determined
- Commonly used for the unstable patient
- Decision making switches from evaluation of diagnostic possibilities to courses of action
 - Rule out “worst case scenario”.

- Must be willing to accept “likely” rather than definitive diagnosis.

Steps to Optimize Decision Making

- Sit at patient’s bedside to collect thorough history.
- Perform uninterrupted physical exam.
- Generate life-threatening and most likely hypotheses.
- Collect data to confirm/exclude life threats first.
- Use established rules to avoid unnecessary tests.
- Order only those tests that affect disposition or confirm/exclude hypothesis.
- Allow 2 to 3 minutes of uninterrupted time to mentally process each patient.
- Use evidence-based medicine techniques.

DECISION-MAKING ERRORS

- What common decision-making errors do you see in practice?
- What influences lead to these errors?
- Attitude/communication
 - Fear, stereotyping, blame patient for illness, poor communication with ED staff or consultant
- Technical skill
 - Improper technique, force of habit
- Data gathering
 - Faulty history and physical exam
 - Only seeing what you want to see
 - Unfocused diagnostic testing
 - “Trial-and error” and “shotgun” test ordering

Attitude bias: stereotype cultural difference in expression of severity of pain

Attribution error: blame drunk patient for fall leading to injury

Confirmation bias: only seeing what you want to see, “ignore cues” (t-wave inversion “nonspecific” instead of ischemia)

DIAGNOSTIC DECISION MAKING

- Over focus on single source of data despite other sources.
- Well-practiced mental routine improperly applied.
- Failure in memory or knowledge base.
- Replacing new behavior with familiar one under stress.
- Diagnosis discounted because of atypical presentation.
- Patient in outpatient department, thus not really sick.
- Failure to consider medical diagnosis due to psychiatric illness.
- Accepting previous diagnosis without question.
- Presume you have nothing to add to prior workup.
- Overconfidence.
- Failure to verify “fit”.

MANAGEMENT DECISIONS

- Unwillingness to accept a good or likely presumptive diagnosis before making critical

- time-dependent therapeutic decision

STRATEGIES TO MINIMIZE ERROR

- Consider that the biggest obstacle to correct diagnosis may be the previous diagnosis
- Avoid inheriting diagnostic or personal bias
- Check for critical PMH and risk factors for serious disease or poor outcome
- Pay attention to vital signs
- Avoid premature closure if diagnosis is uncertain
- Beware of high-risk times
 - Sign-out
 - High volume
 - High acuity
 - Personal fatigue
- Beware of high-risk patients
 - Hostile, violent
 - ETOH/drug abuse
 - Psychiatric
- Beware of high-risk diagnoses
- Myocardial Infarction
- Pulmonary Edema
- Intracranial hemorrhage
- Tendon/nerve injuries
- Retained foreign body
- Vascular catastrophes
- Appendicitis
- Meningitis
- Ectopic pregnancy
- Testicular/ovarian torsion
- Rule out “worst case” scenario and high-risk diagnoses first
- Beware of the “non-fit” (presumptive dx does not match symptoms, signs, or tests)
- Reevaluate and refine hypotheses
- Beware of return visit
- Opportunity to correct what was missed

Key Messages:

- Emergency medicine demands thorough and efficient decision making
- Critical time-dependent decisions must often be made without a definitive diagnosis
- Consistent study is important to maintain knowledge-based decision making
- Identify deficiencies in decision making and take steps to correct and improve
- Identify and employ strategies to minimize error

"Once we realize that imperfect understanding is the human condition there is no shame in being wrong, only in failing to correct our mistakes."

-George Soros