

Introduction to Emergency Medicine

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History of EM

- 1970: The first EM residency was established at the University of Cincinnati
- 1973: The EMS Act authorized the establishment and expansion of EMS systems and research
- 1975: the AMA approves a permanent section of EM and accepted standards of EM residency
- 1979: EM recognized as the 23rd medical specialty
- 1982: Requirements for EM residency programs approved, 50 programs reviewed
- 1989: Primary board status granted
- 2012: Residencies: 153 EM; 2 EM/FP; 11 EM/IM; 3 EM/Peds...over 1700 residents per year in the US

What is Emergency Medicine?

- Definition developed by ACEP:
 - “Emergency medicine is the medical specialty with the principal mission of evaluating, treating and preventing unexpected illness and injury. It encompasses a unique body of knowledge... [It] encompasses the initial evaluation, treatment and disposition of any person at any time for any symptom, event or disorder deemed by the person—or someone acting on his or her behalf—to require expeditious medical, surgical or psychiatric attention.”

Additional responsibilities of the Emergency Physician

- Administration
- Disaster planning and management
- Toxicology
- Health care services research
- Education
- Preventive medicine
- Basic and clinical research

ABEM Boarded EM Sub-specialties

- Hospice and Palliative Medicine
- Medical Toxicology
- Pediatric Emergency Medicine
- Sports Medicine
- Undersea and Hyperbaric Medicine
- Critical Care
- EMS

Other EM fellowships

- Ultrasound
- Disaster Medicine
- Research
- Informatics
- Simulation
- Administration
- Education
- Injury Control
- Legal Medicine
- Cardiovascular
- Clinical Pharmacology
- Clinical Forensic
- Health Policy
- Wilderness Medicine
- Neurologic/Neurovascular
- Transport
- Environmental Health
- International
Medicine/Global Health
- Faculty Development
- Trauma
- Geriatric EM
- Telemedicine

Guiding Principles of Emergency Medicine

Is a life threatening process causing the patient's complaint?

- Always the first question
- EM is complaint-oriented rather than disease-specific
- More important to anticipate and recognize life-threatening processes rather than to make a specific diagnosis

What must be done to stabilize the patient?

- May require a direct intervention in a life-threatening process, or an intervention that anticipates a critical problem developing
- Requires awareness of the pathologic processes associated with the patient's presenting symptoms, not a specific diagnosis

Life-threatening diagnoses → most serious diagnoses

- Consider the most serious disease consistent with the complaint and work to exclude it
- “Thinking the worst” is the opposite kind of assessment technique as most other specialties
- Especially important due to the fact that the patients are unknown to EM physicians, a large proportion may be intoxicated, provide fragmented histories, masked physical exam findings or have a significant emotional overlay

Is more than one active pathologic process present?

- A single diagnosis may not be present or appropriate
- Always ask “is that all there is?”
- Assess and reassess the possibilities
- Especially important since the initial assessment is usually brief and may be incomplete

Diagnostic-therapeutic trials

- It may be possible to simultaneously stabilize and narrow the differential
- Examples: glucose or naloxone given to the unconscious patient often treat and diagnose the problem
- Integrating therapy and diagnosis is frequently more efficient in the emergency care of patients

Is a diagnosis possible or even necessary?

- Becoming comfortable with uncertainty, especially before important decisions are made
- Also applies during disposition
- Knowing when to stop an assessment or treatment is as important as knowing when to persist
- Many serious problems require early disposition to outside sites before a specific diagnosis is made (penetrating abdominal trauma, STEMI, etc)

Is hospitalization appropriate? If so, where?

- The “bottom line” decision for the EP
- Risk stratification is delineation of different groups of patients with varied potential for specific diagnosis
- Once the patient’s condition (or risk) is recognized and stabilization has begun, the majority of the EP’s clinical work is done
- Other reasons for continued care include: benefit to the admitting physician, to maintain clinical acumen, lack of inpatient space

Discharging patients

- All important information may not be available immediately
- An appropriate discharge disposition should include the patient's basic understanding of
 - His underlying problem
 - The evaluation and treatment given in the ED
 - When and with whom he should follow up
 - Criteria by which the patient can judge whether a return for further assessment may be necessary

The concept of “our” patient

- Based on mutual trust and respect
- The combination of a primary physician’s historical knowledge of a patient with the EP’s bedside information is powerful... and sometimes essential.

Charting

- “If it isn’t charted, it didn’t happen”
- Clarity, completeness and efficiency in charting cannot be overstated

Patient expectations

- Every patient has a requirement. If unmet, an explanation is necessary
- Every patient in the ED is given something: an explanation, a referral, a specific therapeutic regimen
- Important to maintain sensitivity, awareness, and the ability to recognize verbal and non-verbal cues

Resources

- Maintenance of equipment and adequate staffing
- Evidence-based trends and breakthroughs
- Continuous quality improvement/assurance
- An ED is not a walk-in clinic or storage depot for admitted or about-to-be admitted patients
- The ED must be dedicated first and foremost to the critically ill and injured patient. This service is essential to the community and must not be abused.

Clinical Decision Making in the ED

Heuristics for optimal decision making

- Sit at the bedside
- Perform an uninterrupted physical exam
- Generate life-threatening and most-likely hypotheses
- Use databases and expert systems to broaden your diagnostic hypothesis
- Collect data to confirm/exclude life threats first, then most-likely diagnoses
- Avoid diagnostic testing when appropriate
- Order only tests that will affect disposition or confirm or exclude hypotheses

Heuristics for optimal decision making

- Use guidelines and protocols for specific therapeutic decision to conserve mental energy
- Allow 2-3 minutes of uninterrupted time to mentally process each patient
- Mentally process one patient at a time
- Avoid decision making when stressed or angry
- Use EBM to substantiate decisions, understand limitations and answer specific questions

Errors in medical decision making

- Affective (anger, overconfidence, prejudice, fear)
- Psychomotor (usually procedural)
- Cognitive errors in medical inquiry (data gathering, unfocused diagnostic testing, confirmation bias)
- Cognitive errors in pattern-recognition (inadequate knowledge or experience base)
- Cognitive error in using rules (wrong rule or incorrectly applied)
- Cognitive error in hypothetico-deductive decision making (misjudging the need for a novel hypothesis or diagnostic accuracy of the hypothesis verification)
- Errors in management processes (decision analysis)

Heuristics to minimize errors in decision making

- The biggest obstacle to making the correct diagnosis is a previous diagnosis
- Avoid inheriting someone else's thinking (diagnostic or personal bias)
- Check for critical past medical history and risk factors
- Pay attention to vital signs, nursing and EMS notes

Heuristics to minimize errors in decision making

- Avoid premature closure if the diagnosis is uncertain
- Beware of high risk times (sign out, high-volume and high-acuity, personal fatigue)
- Respect the return visit
- Beware of the non-fit (when the presumptive diagnosis does not match the presenting symptoms, signs or diagnostic tests)

Be aware of high risk diagnoses

- AMI
- PE
- SAH
- Tendon/nerve injuries
- Retained foreign body
- Intracranial hemorrhage in an intoxicated patient
- Vascular catastrophe in an elderly patient
- Appendicitis
- Meningitis
- Ectopic pregnancy
- Testicular torsion

Additional resources for the interested student

- Hamilton G. Emergency Medicine, An Approach to Clinical Problem-Solving, 2nd edition. Saunders 2003
- Marx. Rosen's Emergency Medicine: Concepts and Clinical Practice, 5th edition. Mosby 2002.
- www.acep.org
- www.abem.org
- www.saem.org