Thinking At Light Speed

Developing Good Instincts In Your Students

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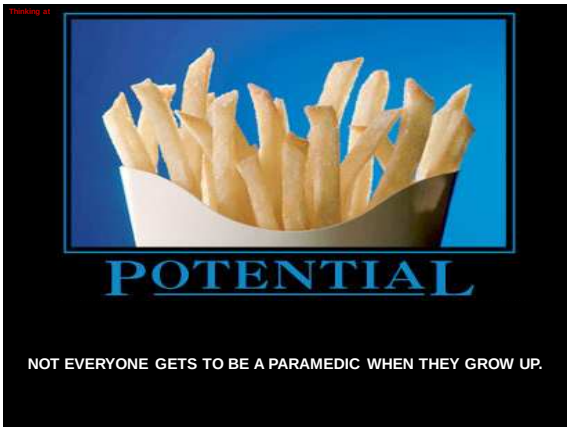
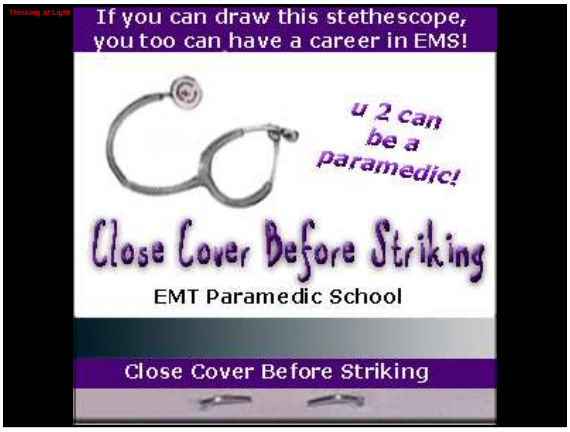
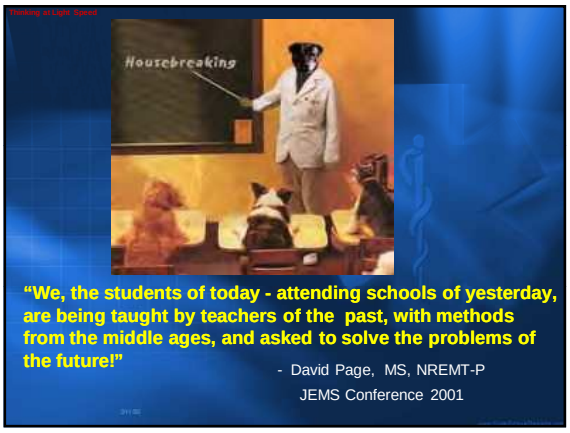




Objectives

- Examine the shortcomings of current EMS education
- Discuss the role of Socratic dialogue in teaching methodology
- Examine the role of scenario and problem-based learning in developing critical thinking skills
- Examine the role of team-based learning in developing critical thinking skills



"We, the students of today - attending schools of yesterday, are being taught by teachers of the past, with methods from the middle ages, and asked to solve the problems of the future!"

- David Page, MS, NREMT-P
JEMS Conference 2001

Defining The Problem

- Shortcomings of current EMS education and practice:
  - Heavily dogmatic
  - Heavy reliance on assessment and treatment algorithms
  - Heavily protocol-based
  - Favors rote-memorization over understanding
  - Minimal training in A&P and pathophysiology at the lower levels

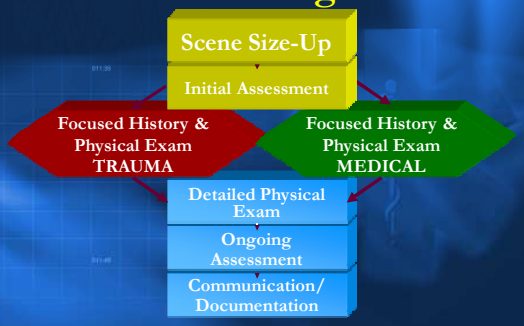
Dogma in EMS Education

- Spinal immobilization
- The Golden Hour
- Helicopter EMS
- Fluid resuscitation in shock
- ALS in cardiac arrest
- Many others

Assessment and Treatment Algorithms

Are protocols a cookbook medicine?

Assessment Algorithm



Protocols: Floor or Ceiling?

- In theory:
  - Least competent medic is required to do at least the same basic treatment steps as the most competent medic.
- In practice:
  - Most competent medic is forced to lower his standard of care to that of the least competent medic.

Most important words in an EMS protocol: "may" and "consider."

1993 EMT-B Curriculum

- 110 clock hours
- Symptomatic treatment
- Little background or theory
- Precious little anatomy and physiology
- No pathophysiology
- Learning is limited to rote memorization of signs and symptoms
- *Huge* knowledge gap between EMT-B and higher levels

1999 EMT-I and EMT-P Curricula

- Deeper and broader than previous curricula
- Expanded theory
- Strong emphasis on pathophysiology
- First curricula to directly address critical thinking
- Gave the instructor more freedom in teaching

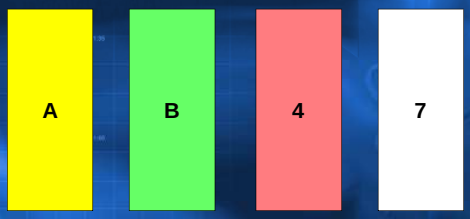
Levels of Competency

- Novices
  - Rigid adherence to taught rules or plans
  - Little situational perception (symptom management only)
  - No discretionary judgment
- Competent practitioner
  - Able to cope with pressure
  - Sees actions partly in terms of long-term goals and broader conceptual framework (disease management)
  - Follows standardized and routine procedures
- Expert practitioner
  - No longer relies on rules, guidelines or maxims
  - Intuitive grasp of situations
  - Uses analytic approaches only in novel situations or when problems occur

The Box

- Lecture and practical lab format
- Canned assessment and treatment algorithms
- Multiple choice exams
- Restrictive protocols
- Instructor cloning

Wason Cards



"If a card has a vowel on one side,
Which card(s) must you turn over to determine that statement is false?
then it has an even number on the other side."

False Dichotomy

- The false dilemma that occurs when answers are limited to only a few competing alternatives, when actually there are many.
- "Black or white" thinking.
- Promotes the idea that there is only one answer to a question, or one solution to a problem.

Outside The Box

- Student-directed learning
- Facilitation, not lecturing
- Case-based learning
- Problem based learning
- Team-based learning
- High fidelity simulators

Socratic Dialogue

- Teacher asks an open-ended question and solicits answers from the group.
- Students are encouraged to reflect and think critically.
- Teacher serves as facilitator
  - Pointing out logical fallacies
  - Reinforcing logical conclusions
- All students contribute to the discussion
- *Students* arrive at a consensus answer to the question.

Metacognition

- Coined by John Flavell in 1976
- "Learning to learn."
- Two elements:
  - Knowledge
    - Conscious
    - Intuitive
    - Learning goals
  - Strategy
    - Resource allocation
    - Learning plan
    - Evaluation and monitoring

Critical Thinking

Critical thinking is the skillful application of a repertoire of validated general techniques for deciding the level of confidence you should have in a proposition in the light of the available evidence.

Austhink.org

Promoting Critical Thinking

- Teaching methods that:
  - Are concept-based rather than procedure-based.
  - Focus on *using* key concepts, rather than just memorizing them
  - Utilize teacher as facilitator, not lecturer
  - Encourage active students rather than passive listeners

Problem-Based Learning

- Establish the case
- Analysis of the problem by small groups
  - What do we know?
- Brainstorming
- Students formulate learning objectives
  - What do we need to know?
- Dissemination of findings
  - Possible explanations.
- Assimilation of results
  - Self-study toward learning objectives
- Identify areas for improvement
  - Integrate lessons learned into clinical practice

Zebra Practice!

- Divide class into small groups of 6-8
- Divide each group into two teams
- Have Team A design a scenario based upon one symptom, while Team B prepares to work the scenario
- Have Team A debrief Team B after conclusion of the scenario
- Swap team roles

Symptom-Based Games

60 minutes

Team-Based Learning

- Groups must be properly formed and managed
  - Avoid members with prior relationships
  - Cultural mix
  - Distribute member resources fairly
  - Form permanent groups

Team-Based Learning

- Make students accountable for:
  - Individual preparation (RAT)
  - Devoting time and effort to group assignments (Peer Assessment)
  - Interacting with each other productively

Team-Based Learning

- Team assignments must promote both individual learning and team development
  - Readiness Assessment Test
  - Peer Review
  - Final Evaluation

Team-Based Learning

- Students *must* receive frequent and immediate feedback
  - Timely feedback from RATs
  - Must be public
    - Students become invested in protecting the group "image."
    - Members know when they have failed to properly utilize their resources.
  - Timely feedback on team assignments

Example TBL Exercise

"Develop an assessment and treatment protocol for acute pulmonary edema."

- Divide class into independent teams.
- At the conclusion of the exercise, combine the teams.
- Have them dissect each other's work, refine and build upon it.
- Have your combined team present the finished product.

TBL Exercise

60 minutes

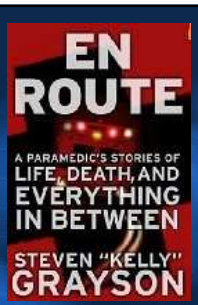
Summary

- Think outside the box of traditional education!
- Re-examine the way you evaluate students
- Empower your students through:
  - Problem-based learning
  - Case-based learning
  - Team based learning

Practical Exercise

45 minutes

Questions?



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