Writing Exam Questions
The NBME Way

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What should be tested?

• Content should match objectives
• Important topics should be weighted more heavily
• Testing time devoted to each topic should reflect the relative importance of the topic
• The sample of items should be representative of the instructional goals of the course
Exam Questions

- Recall of knowledge

- Application of knowledge
  - High order of thinking
    Recall, then
    Interpret or Apply

Components of a Question

A 15-year-old girl presents to the office with a sore throat and fever of 2 days duration. She has had a moderate sore throat, congested nose, and a temperature up to 102.7°F (38.9°C). She has no cough. She has no allergies. Her blood pressure is 90/54 mmHg, pulse is 100/min, respiratory rate is 18/min, and temperature is 102.6°F (38.9°C). The tympanic membranes are normal. Throat is erythematous with tonsillar swelling and white exudate. The anterior cervical lymph nodes are swollen and tender.

Which of the following is the most appropriate pharmacotherapy?

- A. Azithromycin
- B. Cephalexin
- C. Oseltamivir
- D. Penicillin VK
- E. Tetracycline

Answer: D
The Vignette

Patient Scenario

• Patient’s Age and Gender
  – Race not used unless significant for the problem

• CC/HPI
  – Location of presentation
  – Nature of onset
  – Duration of symptoms
  – Additional pertinent history
    • Significant risk factors, FH, SH, ROS

• Examination findings
  – Vital signs
  – Pertinent positive and negative findings

• Pertinent Diagnostic Studies

The Vignette

Non-patient Related Scenario

• Experiment Vignettes
  – Describe protocol
  – Provide results

• Basic Science Observation Vignette
  – Describe a specific set of findings
    • Anatomical
    • Physiological
Non-Clinical Vignette

Several contiguous cells are labeled with a fluorescent dye that cannot cross cell membranes. One cell is experimentally bleached with light that destroys the dye, but soon recovers dye fluorescence. This recovery is best explained by the presence of which of the following structures between the bleached cell and its fluorescent neighbors?

A. A basal lamina
B. Desmosomes (maculae adherentes)
C. Gap junctions
D. Glycosaminoglycans
E. Tight junctions (zonulae occludentes)

The Vignette

- All the necessary information
- At the examinees’ educational level
- Does not just test isolated facts
- Applies knowledge
- Requires interpretation or problem solving
# The Vignette

- Focus on key concepts and principles
- Real-world problems
- Should be relevant
  - Common
  - Potentially catastrophic
  - Avoid esoteric topics
- Avoid clinical situations that require a (sub)specialist

**Constructing Written Test Questions for the Basic and Clinical Sciences, 3rd ed, NBME**

# Lead-In

- Clear Focused Question
- Stated in the positive
- Avoid *all of the above* and *none of the above*
- Examples
  - Which of the following is the most likely explanation for these findings?
  - For which of the following conditions is the patient at greatest risk?
  - Which of the following is most likely to have prevented this condition?
  - Which of the following is the most likely pathogen?
  - Which of the following is the most likely location of the patient’s lesion?
  - A biopsy is most likely to show which of the following?
  - Which of the following is the most appropriate initial (or next) step in patient care?
  - Which of the following is the most effective management?
  - Which of the following is the most appropriate pharmacotherapy?

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Answers

- Should relate to the vignette
- The vignette should support the correct answer
- Each option should be explained by the findings in the vignette
- Each option should be plausible
- 3-4 distractors
- Short parallel options

Item Difficulty
The Angoff Method

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<th>Rating</th>
<th>Description</th>
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<td>minimally competent student is likely to correctly answer the question (indicated Yes in Benware)</td>
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<tr>
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<tr>
<td>0</td>
<td>minimally competent student is not likely to correctly answer the question (indicated as No in Benware)</td>
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**Minimally Competent**

**Borderline Student**

- Student who would just barely pass
- Student who has a 50/50 chance of passing vs failing
- What’s the probability a borderline student would accomplish each item?

**Time to Practice**

Start with an objective:
Describe signs and symptoms, epidemiology, etiology, genetics, pathology, pathophysiology, pathogenesis, clinical features, diagnostic criteria, laboratory and imaging findings, treatment options, prognosis, and sequelae of asthma.

Think of a differential diagnosis (drives the answers):

Create the lead-in:

Write the vignette:

Angoff the Question:
Time to Practice

• Rewrite or create a new question
  – Vignette-based

• Link the Question to at least 1 objective

• Assign an Angoff rating