

**Leischner Institute Scholars Program  
Question-Writing Session**

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**January 23, 2009**

**USMLE 1 Step Organization**

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- The USMLE is a comprehensive, integrated exam organized along two major dimensions
  - System
  - Process

## **System**

- General Principles
  - e.g., Homeostasis, DNA replication,...
- Organ Systems

## **Process**

- Normal Processes
  - e.g., development, structure, etc.
- Abnormal Processes
  - e.g., infection, neoplasia, trauma
- Principles of Therapeutics
- Psychosocial, Cultural, Behavioral

## Organization of FHB

- Cellular
- Neural
- Blood
- Muscle
- Heart
- Vascular
- Renal
- Pulmonary
- Acid - Base
- GI - Metabolism
- Endocrine

## Organization of MHD

- Basic Pathologic Processes
- Coagulation / Bleeding
- Heart & Vascular
- Lung
- Hematopathology
- GI
- Endocrine
- Female / Male Genital Tract
- Bones & Joints
- Renal
- Skin

## USMLE 2 Step Organization

**Normal Conditions and Disease categories (Dimension 1)** form the main axis for organizing the outline. The first section deals with normal growth and development, basic concepts, and general principles. The remaining sections deal with individual disorders.

**Sections focusing on individual disorders are subdivided according to Physician Task (Dimension 2).**

The first set of physician tasks, **Promoting Preventive Medicine and Health Maintenance**, encompasses the assessment of risk factors, appreciation of epidemiologic data, and the application of primary and secondary preventive measures.

The second set of tasks, **Understanding Mechanisms of Disease**, encompasses etiology, pathophysiology, and effects of treatment modalities in the broadest sense.



## **General Rules for Developing A-Type Questions**

1. Focus items on an important concept, typically a common or potentially catastrophic clinical problem. Case vignette-type items should involve clinical situations that a “general intern might encounter in the context of supervised practice. Avoid trivia or areas that should appear on a subspecialty exam
2. Structure the clinical vignettes as case presentations. Begin vignettes with presenting problem and its history, followed by related history and physical findings, results of tests, initial treatment---in same order.

## **General Rules for Developing A-Type Questions**

3. The stem of the item must pose a clear question, and it should be possible to arrive at an answer with the items covered up.
4. All distracters (e.g. incorrect options) should be homogeneous in most cases; this means that they should fall into the same category as the correct answer (e.g., all diagnostic tests, treatments, diagnoses, etc.)
5. Avoid using “double options” (e.g., do W and X; do Y because Z) unless the correct answer and all distractors are double options.
6. Avoid vague terms (usually, often, frequently) and absolutes (always, never and all)

## Good Type-A Question for Step 2

A 32 year old man has a 4 day history of progressive weakness in his extremities. He was healthy except for an upper respiratory tract infection 10 days ago. His temperature is 37.8 C (100 F), blood pressure is 130/80 mm Hg, pulse is 94/min and respirations are 42/min and shallow. His has symmetric weakness of both sides of the face and the proximal and distal muscles of the extremities. Sensation is intact. No deep tendon reflexes can be elicited; the plantar responses are flexor. Which of the following is the most likely diagnosis?

- A. Acute disseminated encephalomyelitis
- B. Guillain-Barre syndrome
- C. Myasthenia gravis
- D. Poliomyelitis
- E. Polymyositis

## Technical Item Flaws

**Grammatical cues:** one or more distractors do not flow grammatically from the stem

*A 60-year-old man is brought to the emergency department by the police, who found him lying unconscious on the side walk. After ascertaining that the airway is open, the first step in management should be intravenous administration of:*

- A. *Examination of cerebrospinal fluid*
- B. *Glucose with vitamin B1 (thiamine)*
- C. *CT scan of the head*
- D. *Phenytoin*
- E. *Diazepam*

## Technical Item Flaws

Absolute terms: terms such as “always” or “never” are used in options

*In patients with advance dementia, Alzheimer’s type, the memory defect:*

- A. *Can be treated adequately with phosphatidylcholine (lecithin)*
- B. *Could be a sequela of early parkinsonism*
- C. *Is never seen in patients with neurofibrillary tangles at autopsy*
- D. *Is never severe*
- E. *Possibly involves the cholinergic system*

## Use of Imprecise Terms in Examination Questions

*True statements about pseudogout include:*

- 1. *It occurs commonly in women*
- 2. *It is often associated with acute pain.*
- 3. *It is usually hereditary*
- 4. *Serum calcium levels are frequently increased.*

## Technical Item Flaws

**Frequency terms: options are vague (e.g., rarely, usually)**

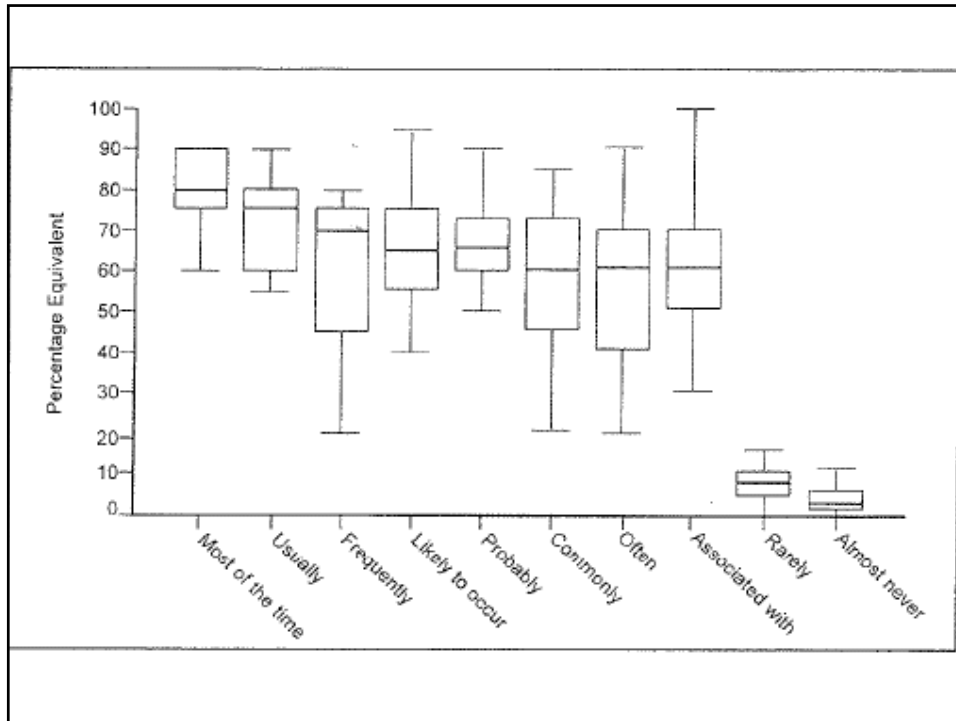
*Severe obesity in early adolescence:*

- A. *usually responds dramatically to dietary regimens*
- B. *often is related to endocrine disorders*
- C. *Has a 75% chance of clearing spontaneously*
- D. *Shows a poor prognosis*
- E. *Usually responds to pharmacotherapy and intensive psychotherapy*

## Use of Imprecise Terms in Examination Questions

*Patients with pseudogout have pain:*

- A. *frequently*
- B. *usually*
- C. *often*
- D. *commonly*



## Technical Item Flaws

**Long correct answer:** correct answer is long, more specific or more complete than other options

*Secondary gain is*

- A. *synonymous with malingering*
- B. *a frequent problem in obsessive-compulsive disorder*
- C. *A complication of a variety of illnesses and tends to prolong many of them*
- D. *Never seen in organic brain damage*

## Technical Item Flaws

### Options are long, complicated or double

*Peer review committees in HMOs may move to take action against a physician's credentials to care for participants of the HMO. There is an associated requirement to assure that the physician receives due process in the course of these activities. Due process must include which of the following?*

- A. *notice, an impartial forum, council, a chance to hear and confront evidence against him/her*
- B. *proper notice, a tribunal empowered to make the decision, a chance to confront witnesses against him/her, and a chance to present evidence in defense*
- C. *reasonable and timely notice, impartial panel empowered to make a decision, a chance to hear evidence against himself/herself and to confront witnesses, and the ability to present evidence in defense*

## Technical Item Flaws

**Word Repeats:** a word or phrase is included in the stem and in the correct answer

*A 58-year old man with a history of heavy alcohol use and previous psychiatric hospitalization is confused and agitated. He speaks of experiencing the world as unreal. This symptom is called*

- A. *depersonalization*
- B. *derealization*
- C. *focal memory deficit*
- D. *signal anxiety*

## Good Type-A Question for Step 2

*An 8-year-old boy needs to be coaxed to go to school, and often, while there, he complains of severe headaches or stomach pain. Sometimes his mother has to take him home because of his symptoms. At night, he tries to sleep with his parents. When they insist he sleep in his own room, he says there are monsters in his closet. These findings are most consistent with which of the following diagnoses?*

- A. *Childhood schizophrenia*
- B. *Normal concern of latency-age children*
- C. *Separation anxiety disorder*
- D. *Socialized conduct disorder*
- E. *Symbiotic psychosis*

## Technical Item Flaws

**Convergence Strategy:** the correct answer includes the most elements in common with the other options

*Local anesthetics are most effective in the*

- A. *anionic form, acting from inside the nerve membrane*
- B. *cationic form, acting from outside the nerve membrane*
- C. *cationic form, acting from inside the nerve membrane*
- D. *uncharged form, acting from inside the nerve membrane*
- E. *Uncharged form, acting from outside the nerve membrane*

## Technical Item Flaws

### Numeric data are not stated consistently

*Following a second episode of infection, what is the likelihood that a woman is infertile?*

- A. *less than 20%*
- B. *20 to 30%*
- C. *Greater than 50%*
- D. *90%*
- E. *75%*

## Good Type-A Question for Step 1

*Genes on the bacterial chromosome have the following linkages in conjugal transfer: x and y, 25% of the time; y and z, 50% of the time. If the gene order is x-y-z, approximately what percentage of the time will x and z be transferred together?*

- A. *<1% of the time*
- B. *5% of the time*
- C. *15% of the time\**
- D. *25% of the time*
- E. *40% of the time*

## Technical Item Flaws

**Language in the options is not parallel;  
options are in an illogical order**

*In a vaccine trial, 200 2-year-old boys were given a vaccine against a certain disease and then monitored for five years for occurrence of the disease. Of this group, 85% never contracted the disease. Which of the following statements concerning these results is correct?*

- A. *no conclusion can be drawn, since no follow-up was made of nonvaccinated children*
- B. *the number of cases (i.e., 30 cases over five years) is too small for statistically meaningful conclusions*
- C. *no conclusions can be drawn because the trial involved only boys*
- D. *vaccine efficacy (%) is calculated as  $85-15/100$*

## Good Type-A Question for Step 1

*The first-born infant of an Rh-negative 26-yr-old woman who had two previous second trimester abortions has severe hemolysis and circulatory failure. This condition could have been prevented by treating the mother with which of the following?*

- A. *anti-RhD IgG during the most recent pregnancy*
- B. *anti RhD IgG on termination of each of the first two pregnancies\**
- C. *anti-RhD IgM during the most recent pregnancy*
- D. *anti-RhD IgM on termination of the first pregnancy*

## Technical Item Flaws

**“None of the above” is used as an option**

*Which city is closest to New York City?*

- A. *Boston*
- B. *Chicago*
- C. *Dallas*
- D. *Los Angeles*
- E. *None of the above*

*If students select E, you don't know if they are thinking about Philadelphia or London*

## Technical Item Flaws

**Stems are tricky or unnecessarily complicated**

*Arrange the parents of the following children with Down's syndrome in order of highest to lowest risk of recurrence. Assume that the maternal age in all cases is 22 years and that a subsequent pregnancy occurs within 5 years. The karyotypes of the daughters are:*

- I. *46, XX, -14, +T(14q21q) pat*
  - II. *46, XX, -14, +T(14q21q) de novo*
  - III. *46, XX, -14, +T(14q21q) mat*
  - IV. *46, XX, -21, +T(14q21q) pat*
  - V. *46, XX, -21, +T(14q21q) (parents no karyotyped)*
- A. *III, IV, I, V, II*
  - B. *IV, III, V, I, II*
  - C. *III, I, IV, V, II*
  - D. *IV, III, I, V, II*
  - E. *III, IV, I, II, V*

*Drug Y has a volume of distribution (Vd) of 75 L in both younger and older adult men. In younger adults, it has a clearance rate of 15 L/h, 50% of which is via the liver and 50% via the kidneys. For younger men, the maintenance regimen is 100 mg every 6 hours. Which of the following regimens will produce essentially the same steady-state concentration in an older man, whose creatinine clearance is reduced to half that of younger men, but whose hepatic function is unimpaired?*

- A. 75mg every 3 hours
- B. 75 mg every 6 hours
- C. 75 mg every 9 hours
- D. 100 mg every 3 hours
- E. 100 mg every 6 hours
- F. 100 mg every 12 hours

## Other NBME Issues

- Data and Laboratory Results Interpretation
- Figures
- X-rays, MRI, CT, Ultrasound, Pathology etc.
- Multimedia (Physical Exam, Heart Sounds etc.)

### **The Basic Rules for One-Best-Answer Items**

- 1. Each item should focus on an important concept, typically a common or potentially catastrophic clinical problem*
- 2. Each item should assess application of knowledge, not recall of an isolated fact*
- 3. The stem of the item must pose a clear question, and it should be possible to arrive at an answer with the options covered*
- 4. All distractors (i.e., incorrect options) should be homogeneous*
- 5. Avoid technical item flaws that provide special benefit to test-wise examinees or that pose irrelevant difficulty*