Writing a multiple-choice test question

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This volume of the *JAOA* starts a new monthly section—"Program Director's Notebook." Designed to provide practical tips for directors of medical education and residency program directors, this section will help to enhance the quality of administration, teaching, and evaluation in graduate medical education. The first article in this series addresses a common problem: how to write a multiple-choice test question.

Future articles in this series will cover topics in curriculum design, faculty development, program administration, and educational evaluation. This section should be of interest to all those individuals in teaching roles in both undergraduate and graduate osteopathic medical education. Interns and residents will also find this section useful as they prepare for careers in academic medicine.

HELEN H. BAKER, PhD
Section Editor

Multiple-choice test questions are the most widely used and highly regarded of the presently available objective or selective test items. They can be used to test all levels of learning and are applicable to the measurement of most important educational outcomes. Although it is difficult to construct these questions well, they are versatile and can be used in settings involving large numbers of students.

(Key words: Multiple-choice question, objective/selective item)

The need to assess education and to measure achievement is everpresent. Educators and scholars have been struggling for thousands of years with the question of how to best ac-

complish this assessment. Oral examinations were probably given before human beings developed written communication. Essay tests date back to earlier than 2300 BC in ancient China and, until the turn of the century, they were about the only form of written examination in wide use.¹

Many factors, both philosophic and practical, have contributed to the development of new testing formats. In addition to the essay test, currently available formats include short-answer, matching, true-false, and multiple-choice examinations. This article will focus on the widely popular multiple-choice-type item, which, in many settings, is used exclusively.

Approaching the evaluation process

Although a detailed discussion of the evaluation process as a whole is beyond the scope of this paper, as an educator, a few general comments should be made. First, approach the

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evaluation process the same way you approach the educational process: Decide what is important and then focus on it. Although it is acceptable to assign students some material to learn on their own, you should, for the most part, examine students on what has been taught to them. Borrowing from the taxonomy developed by Benjamin S. Bloom,² we in medical education tend to operate on several levels of learning. These levels are knowledge, the simple recall of material; comprehension, restating material to show understanding; and application, problem-solving or applying ideas in new situations.

Your examination should reflect not only the topics covered, but also the various levels at which they were taught. A two-way grid (Figure), sometimes called a table of specifications, is a good way to organize a written plan for determining how to apportion your test content.

Grouping test items

Having defined *what* we are going to test, we must now determine *how* we are going to test it. Although many educators classify examinations as subjective or objective, I prefer to group test items into one of two categories: selection items, those such as matching, true-false, or multiple choice, which require that students *select* the correct answer; and production items, which are short-answer or essay questions that require students to *produce* an acceptable answer. Although all these formats have a place in evaluation, multiple-choice test items are currently the most highly regarded and widely used. They are adaptable to the measurement of most important educational outcomes of knowledge, understanding, and judgment; of ability to solve problems, to recommend appropriate actions, and to make predictions.

Almost any understanding or ability that can be tested by means of any other item form can also be tested by means of the multiple-choice test item. Its strengths, like the other items in the selection category, are that they require relatively little student time to answer, they cover more of the material because more

TOPICS	LEVELS OF LEARNING		
	Knowledge	Comprehension	Application
A			
B			
C			

Figure. On this two-way grid, plot topics versus levels of learning and fill in each cell with the percentage of time. This same percentage devoted to the instruction should be allotted to the test.

questions can be asked, and they are easily and accurately scored by a person or machine.

Limitations also exist. Multiple-choice questions do not allow for the demonstration of knowledge beyond the range of the options provided. They are also difficult and time-consuming to write well, although many inexperienced test writers would think the opposite. Finally, it has been said that they encourage guessing, but I have never thought this to be a serious problem. (If you were, for example, to guess blindly on ten multiple-choice questions, each with five distracters, your chances of achieving a perfect score would be one in 10 million!)

Anatomy of a multiple-choice question

In considering the anatomy of a multiple-choice question item, we can dissect it into three parts: the stem, a question or incomplete sentence that clearly implies a question; the correct answer; and distracters, several plausible but incorrect answers to the question. It should also be mentioned that there are several variations of the multiple-choice question, the K-type question (that in which there are multiple combinations of correct responses within each question) being the most notorious. Here, however, we will focus on the standard A-type question, which has four or five distracters, just one of which is correct.

The function of the item stem is to acquaint

the examinee with the problem being posed. Ideally, it should state or imply a specific question. Although one can sometimes save words without loss of clarity by using an incomplete statement as the item stem, a direct question is most often better. Not only does a direct question tend to present the student with a more specific problem, it also tends to focus the item writer's purposes more clearly and to help the student avoid irrelevance or unrelatedness in the distracters.³

One should include as much of the item as possible in the stem so that it is not necessary to repeat the same phrase in each of the options. A positive question should be used wherever possible. If a negative question must be used, the negative word should be underlined. In testing definitions, it is best to use the term being defined in the stem and to offer optional definitions as distracters. Wordy and needlessly complex stems should be avoided. Similarly, informational preambles that serve only as window dressing and do not help the examinee understand the question being asked are unnecessary and should also be avoided.

There is no set number of possible responses, although it is usually recommended that there be one correct answer and three or four distracters. On most board examinations, it has become standard to use five possible responses. The response options should be lettered using capital letters because small, or lowercase, letters can be difficult to distinguish.

When devising distracters, all options should be plausible responses. One should not write poor alternatives just for the sake of having more responses. All options should be clearly distinguished by being listed on separate lines. Preferably, the options should be somehow related—sound, content, et cetera—and should be grammatically consistent with the stem. The options for an individual item should be approximately the same length; one should especially avoid making correct responses consistently longer throughout the examination.

Ambiguous, imprecise terms such as “several,” “seldom,” and “frequently” should be avoided. Instead, more specific phrases such

as “50% of the time” or “two out of three” should be used. Contrarily, options that are too similar in value (1%, 2%, 3%, 4%, and 5%) or artificially precise (55.97%) should also be avoided. Whenever responses form a quantitative or qualitative scale, they normally should be arranged in order of magnitude either from smallest to largest or from largest to smallest.

A frequently used technique, but one to be avoided, is the listing of several factual responses along with other options, such as “all of the above,” “none of the above,” or “A and B but not C.” This technique is probably most often used when the item writer can think of only a few good distracters. It should be frowned on because it tends to make the item either ambiguous or selection of the correct response too easy.

Other considerations

Aside from the details of the items themselves, there are other questions to be considered. For example, how many items should be on the test? Although, for the most part, longer examinations have increased reliability and validity, test length is most often determined by how much time is available. A good rule of thumb is to allow approximately 1 minute for each multiple-choice item.⁴ It is statistically convenient, then, for a 1-hour test to contain 50 items and a 2-hour test to contain 100 items.

Another problem to deal with is the level and distribution of difficulty of the items. Without going into a lengthy or statistical discussion, theoretical analyses and experimental studies have demonstrated quite convincingly that in most situations questions that are neither very difficult nor very easy are best.⁵ In other words, questions of moderate difficulty will tend to “spread out” your sample and identify which of the students have mastered the material and which have not.

Comment

Much more could be said, and indeed, many chapters have been written on this subject. As stated, the multiple-choice question has, for

(continued on page 123)

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[†]In patients with renal impairment.

[§]In subjects with normal renal function.

In patients with severe congestive heart failure, unilateral or bilateral renal artery stenosis, pre-existing renal disease, or on concomitant diuretics, changes in renal function may occur. In these patients, renal function should be monitored during the first few weeks of therapy. See PRECAUTIONS in the brief summary of full prescribing information on last page of this advertisement.

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Effective therapeutic response in older and younger[†] patients, black[‡] and nonblack patients

[†]Safety and effectiveness in individuals less than 18 years old have not been established.

[‡]MONOPRIL has an antihypertensive effect even in patients with low-renin hypertension. Although MONOPRIL was antihypertensive in all races studied, black hypertensive patients (usually a low-renin hypertensive population) had smaller average response to ACE inhibitor monotherapy than nonblacks.

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- Low total discontinuation rate: 4.1%
- Most common side effects attributed to drug therapy (%): headache (3.2), cough (2.2), dizziness (1.6), fatigue (1.5), diarrhea (1.5)
- Equally well tolerated in older and younger patients³; black and nonblack patients

*Safety and effectiveness in individuals less than 18 years old have not been established.

[†]In some patients the antihypertensive effect may diminish toward the end of the dosing interval. If trough response is inadequate, dividing the daily dose should be considered. Some patients appear to have a further response to 80 mg.

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ONCE-A-DAY

MONOPRIL® Fosinopril Sodium Tablets

CONTRAINDICATIONS MONOPRIL is contraindicated in patients who are hypersensitive to this product or to any other angiotensin converting enzyme inhibitor (e.g., a patient who has experienced angioedema with any other ACE inhibitor therapy). **WARNINGS: Angioedema:** Angioedema involving the extremities, face, lips, mucous membranes, tongue, glottis or larynx has been reported in patients treated with ACE inhibitors. If angioedema involves the tongue, glottis or larynx, airway obstruction may occur and be fatal. If laryngeal stridor or angioedema of the face, lips, mucous membranes, tongue, glottis or extremities occurs, treatment with MONOPRIL should be discontinued and appropriate therapy instituted immediately. **Where there is involvement of the tongue, glottis, or larynx, likely to cause airway obstruction, appropriate therapy, e.g., subcutaneous epinephrine solution 1:1000 (0.3 mL to 0.5 mL) should be promptly administered** (see PRECAUTIONS: Information for Patients and ADVERSE REACTIONS). **Hypotension:** MONOPRIL can cause symptomatic hypotension. Like other ACE inhibitors, fosinopril has been only rarely associated with hypotension in uncomplicated hypertensive patients. Symptomatic hypotension is most likely to occur in patients who have been volume- and/or salt-depleted as a result of prolonged diuretic therapy, dietary salt restriction, dialysis, diarrhea, or vomiting. Volume and/or salt depletion should be corrected before initiating therapy with MONOPRIL. In patients with congestive heart failure, with or without associated renal insufficiency, ACE inhibitor therapy may cause excessive hypotension, which may be associated with oliguria or azotemia and, rarely, with acute renal failure and death. In such patients, MONOPRIL therapy should be started under close medical supervision; they should be followed closely for the first 2 weeks of treatment and whenever the dose of fosinopril or diuretic is increased. If hypotension occurs, the patient should be placed in a supine position, and if necessary, treated with intravenous infusion of physiological saline. MONOPRIL treatment usually can be continued following restoration of blood pressure and volume. **Neutropenia/Agranulocytosis:** Another angiotensin converting enzyme inhibitor, captopril, has been shown to cause agranulocytosis and bone marrow depression, rarely in uncomplicated patients, but more frequently in patients with renal impairment, especially if they also have a collagen-vascular disease such as systemic lupus erythematosus or scleroderma. Available data from clinical trials of fosinopril are insufficient to show that fosinopril does not cause agranulocytosis at similar rates. Monitoring of white blood cell counts should be considered in patients with collagen-vascular disease, especially if the disease is associated with impaired renal function. **Fetal/Neonatal Morbidity and Mortality:** ACE inhibitors can cause fetal and neonatal morbidity and mortality when administered to pregnant women. When ACE inhibitors have been used during the second and third trimesters of pregnancy, there have been reports of neonatal hypotension, renal failure, skull hypoplasia, and death. Oligohydramnios has also been reported, presumably resulting from decreased fetal renal function; oligohydramnios has been associated with fetal limb contractures, craniofacial malformations, hypoplastic lung development, and intrauterine growth retardation. Prematurity and patent ductus arteriosus have been reported, although it is not clear whether these occurrences were due to the ACE inhibitor exposure or to the mother's underlying disease. It is not known whether exposure limited to the first trimester can adversely affect fetal outcome. A patient who becomes pregnant while taking ACE inhibitors, or who takes ACE inhibitors when already pregnant, should be apprised of the potential hazard to her fetus. If she continues to receive ACE inhibitors during the second or third trimester of pregnancy, frequent ultrasound examinations should be performed to look for oligohydramnios. When oligohydramnios is found, ACE inhibitors should generally be discontinued. Infants with histories of *in utero* exposure to ACE inhibitors should be closely observed for hypotension, oliguria, and hyperkalemia. If oliguria occurs, attention should be directed toward support of blood pressure and renal perfusion. Fosinopril is poorly dialyzed from the circulation of adults by hemodialysis and peritoneal dialysis. There is no experience with any procedure for removing fosinopril from the neonatal circulation. In pregnant rabbits, maternal toxicity was evident at doses ranging from 2.5 to 40 mg/kg/day (approximately 3 to 50 times the maximum recommended human dose). Fosinopril was embryocidal in rabbits at 10 and 40 mg/kg/day (approximately 12 and 50 times the maximum recommended human dose). These effects were probably due to marked decreases in blood pressure caused by ACE inhibition in this species. There were no teratogenic effects in rabbits at any dose level tested. In pregnant rats, there was evidence of maternal toxicity at all dose levels tested, i.e., 25 to 400 mg/kg/day (about 30 to 500 times the maximum recommended human dose). Slight reductions in placental weights and degree of skeletal ossification were observed at all dose levels, and fetal body weights were reduced in the high-dose group. Three similar orofacial malformations and one fetus with *situs inversus* occurred in fosinopril-treated animals. The association of these anomalies with treatment is uncertain. **PRECAUTIONS: General: Impaired Renal Function:** As a consequence of inhibiting the renin-angiotensin-aldosterone system, changes in renal function may be anticipated in susceptible individuals. In patients with severe congestive heart failure whose renal function may depend on the activity of the renin-angiotensin-aldosterone system, treatment with angiotensin converting enzyme inhibitors, including MONOPRIL (Fosinopril Sodium), may be associated with oliguria and/or progressive azotemia and (rarely) with acute renal failure and/or death. In hypertensive patients with renal artery stenosis in a solitary kidney or bilateral renal artery stenosis, increases in blood urea nitrogen and serum creatinine may occur. Experience with another angiotensin converting enzyme inhibitor suggests that these increases are usually reversible upon discontinuation of ACE inhibitor and/or diuretic therapy. In such patients, renal function should be monitored during the first few weeks of therapy. Some hypertensive patients with no apparent pre-existing renal vascular disease have developed increases in blood urea nitrogen and serum creatinine, usually minor and transient, especially when MONOPRIL has been given concomitantly with a diuretic. This is more likely to occur in patients with pre-existing renal impairment. Dosage reduction of MONOPRIL and/or discontinuation of the diuretic may be required. **Evaluation of the hypertensive patient should always include assessment of renal function (see DOSAGE AND ADMINISTRATION).** Impaired renal function decreases total clearance of fosinopril and approximately doubles AUC. In general, however, no adjustment of dosing is needed (see CLINICAL PHARMACOLOGY). **Hyperkalemia:** In clinical trials, hyperkalemia (serum potassium greater than 10% above the upper limit of normal) has occurred in approximately 2.6% of hypertensive patients receiving MONOPRIL. In most cases, these were isolated values which resolved despite continued therapy. In clinical trials, 0.1% of patients (two patients) were discontinued from therapy due to an elevated serum potassium. Risk factors for the development of hyperkalemia include renal insufficiency, diabetes mellitus, and the concomitant use of potassium-sparing diuretics, potassium supplements, and/or potassium-containing salt substitutes, which should be used cautiously, if at all, with MONOPRIL (Fosinopril Sodium) (see PRECAUTIONS: Drug Interactions). **Impaired Liver Function:** Since fosinopril is primarily metabolized by hepatic and gut wall esterases to its active moiety, fosinopril, patients with impaired liver function could develop elevated plasma levels of unchanged fosinopril. In a study in patients with alcoholic or biliary cirrhosis, the extent of hydrolysis was unaffected, although the rate was slowed. In these patients, the apparent total body clearance of fosinopril was decreased and the plasma AUC approximately doubled. **Surgery/Anesthesia:** In patients undergoing surgery or during anesthesia with agents that produce hypotension, fosinopril will block the angiotensin II formation that could otherwise occur secondary to compensatory renin release. Hypotension that occurs as a result of this mechanism can be corrected by volume expansion. **Information for Patients: Angioedema:** Angioedema, including laryngeal edema, can occur with treatment with ACE inhibitors, especially following the first dose. Patients should be advised to immediately report to their physician any signs or symptoms suggesting angioedema (e.g., swelling of face, eyes, lips, tongue, larynx, mucous membranes, and extremities; difficulty in swallowing or breathing; hoarseness) and to discontinue therapy. (See WARNINGS and ADVERSE REACTIONS.) **Symptomatic Hypotension:** Patients should be cautioned that lightheadedness can occur, especially during the first days of therapy, and it should be reported to a physician. Patients should be told that if syncope occurs, MONOPRIL should be discontinued until the physician has been consulted. All patients should be cautioned that inadequate fluid intake or excessive perspiration, diarrhea, or vomiting can lead to an excessive fall in blood pressure, with the same consequence of lightheadedness and possible syncope. **Hyperkalemia:** Patients should be told not to use potassium supplements or salt substitutes containing potassium without consulting the physician. **Neutropenia:** Patients should be told to promptly report any indication of infection (e.g., sore throat, fever), which could be a sign of neutropenia. **Drug Interactions: With diuretics:** Patients on diuretics, especially those with intravascular volume depletion, may occasionally experience an excessive reduction of blood pressure after initiation of therapy with MONOPRIL. The possibility of hypotensive effects with MONOPRIL can be minimized by either discontinuing the diuretic or increasing salt intake prior to initiation of treatment with MONOPRIL. If this is not possible, the starting dose should be reduced and the patient should be observed closely for several hours following an initial dose and until blood pressure has stabilized (see DOSAGE AND ADMINISTRATION). **With potassium supplements and potassium-sparing diuretics:** MONOPRIL can attenuate potassium loss caused by thiazide diuretics. Potassium-sparing diuretics (spironolactone, amiloride, triamterene, and others) or potassium supplements can increase the risk of hyperkalemia. Therefore, if concomitant use of such agents is indicated, they should be given with caution, and the patient's serum potassium should be monitored frequently. **With lithium:** Increased serum lithium levels and symptoms of lithium toxicity have been reported in patients receiving ACE inhibitors during therapy with lithium. These drugs should be coadministered with caution, and frequent monitoring of serum lithium levels is recommended. If a diuretic is also used, risk of lithium toxicity may be increased. **With antacids:** In a clinical pharmacology study, coadministration of an antacid (aluminum hydroxide, magnesium hydroxide, and simethicone) with fosinopril reduced serum levels and urinary excretion of fosinopril as compared with fosinopril administered alone, suggesting that antacids may impair absorption

of fosinopril. Therefore, if concomitant administration of these agents is indicated, dosing should be separated by 2 hours. **Other:** Neither MONOPRIL nor its metabolites have been found to interact with food. In separate single or multiple dose pharmacokinetic interaction studies with chloralhydrate, nifedipine, propranolol, hydrochlorothiazide, cimetidine, metoprolol, propantheline, digoxin, and warfarin, the bioavailability of fosinopril was not altered by coadministration of fosinopril with any one of these drugs. In a study with concomitant administration of aspirin and MONOPRIL, the bioavailability of unfractionated heparin was not altered. In a pharmacokinetic interaction study with warfarin, bioavailability parameters, the degree of protein binding, and the anticoagulant effect (measured by prothrombin time) of warfarin were not significantly changed. **Drug/Laboratory Test Interaction:** Fosinopril may cause a false low measurement of serum digoxin levels with the Digi-Tab® RIA Kit for Digoxin. Other kits, such as the Coat-A-Count® RIA Kit, may be used. **Carcinogenesis, Mutagenesis, and Impairment of Fertility:** No evidence of a carcinogenic effect was found when fosinopril was given in the diet to mice and rats for up to 24 months at doses up to 400 mg/kg/day. On a body weight basis, the highest dose in mice and rats is about 250 times the maximum human dose of 80 mg assuming a 50 kg subject. On a body surface area basis, in mice, this dose is 20 times the maximum human dose; in rats, this dose is 40 times the maximum human dose. Male rats given the highest dose level had a slightly higher incidence of mesentery/omentum lipomas. Neither fosinopril nor the active fosinopril was mutagenic in the Ames microbial mutagen test, the mouse lymphoma forward mutation assay, or a mitotic gene conversion assay. Fosinopril was also not genotoxic in a mouse micronucleus test *in vivo* and a mouse bone marrow cytogenetic assay *in vivo*. In the Chinese hamster ovary cell cytogenetic assay, fosinopril increased the frequency of chromosomal aberrations when tested without metabolic activation at a concentration that was toxic to the cells. However, there was no increase in chromosomal aberrations at lower drug concentrations without metabolic activation or at any concentration with metabolic activation. There were no adverse reproductive effects in male and female rats treated with 15 or 60 mg/kg daily. On a body weight basis, the high dose of 60 mg/kg is about 38 times the maximum recommended human dose. On a body surface area basis, this dose is 6 times the maximum recommended human dose. There was no effect on pairing time prior to mating in rats until a daily dose of 240 mg/kg, a toxic dose, was given; at this dose, a slight increase in pairing time was observed. On a body weight basis, this dose is 150 times the maximum recommended human dose. On a body surface area basis, this dose is 24 times the maximum recommended human dose. **Pregnancy: Pregnancy Category D:** See WARNINGS: Fetal/Neonatal Morbidity and Mortality. **Nursing Mothers:** Ingestion of 20 mg daily for three days resulted in detectable levels of fosinopril in breast milk. MONOPRIL (Fosinopril Sodium) should not be administered to nursing mothers. **Geriatric Use:** Of the total number of patients who received fosinopril in US clinical studies of MONOPRIL, 13% were 65 and older while 1.3% were 75 and older. No overall differences in effectiveness or safety were observed between these patients and younger patients, and other reported clinical experience has not identified differences in response between the elderly and younger patients, but greater sensitivity of some older individuals cannot be ruled out. In a pharmacokinetic study comparing elderly (65-74 years old) and non-elderly (20-35 years old) healthy volunteers, there were no differences between the groups in peak fosinopril levels or area under the plasma concentration time curve (AUC). **Pediatric Use:** Safety and effectiveness in children have not been established. **ADVERSE REACTIONS:** MONOPRIL (Fosinopril Sodium) has been evaluated for safety in more than 1500 individuals in hypertension trials, including approximately 450 patients treated for a year or more. Generally adverse events were mild and transient, and their frequency was not related to dose within the recommended daily dosage range. In placebo-controlled clinical trials (688 fosinopril-treated patients), the usual duration of therapy was two to three months. Discontinuations due to any clinical or laboratory adverse event were 4.1 and 1.1 percent in fosinopril-treated and placebo-treated patients, respectively. The most frequent reasons (0.4 to 0.9%) were headache, elevated transaminases, fatigue, cough, diarrhea, and nausea and vomiting. During clinical trials with any fosinopril regimen, the incidence of adverse events in elderly (>65 years old) was similar to that seen in younger patients. Clinical adverse events probably or possibly related or of uncertain relationship to therapy, occurring in at least 1% of patients treated with MONOPRIL alone in placebo-controlled clinical trials are shown in the table below.

Clinical Adverse Events in Placebo-Controlled Trials	MONOPRIL (N = 688)		Placebo (N = 184)	
	Incidence (Discontinuation)		Incidence (Discontinuation)	
Headache	3.2 (0.9)		3.3	
Cough	2.2 (0.4)		0.0	
Dizziness	1.6		0.0	
Diarrhea	1.5 (0.4)		1.6	
Fatigue	1.5 (0.6)		1.6	
Nausea/Vomiting	1.2 (0.4)		0.5	
Sexual Dysfunction	1.0 (0.1)		1.1 (0.5)	

Other clinical events probably or possibly related, or of uncertain relationship to therapy occurring in 0.2 to 1.0% of patients (except as noted) treated with MONOPRIL in controlled or uncontrolled clinical trials (N = 1479) are less frequent, clinically significant events include (listed by body system): **General:** Chest pain, edema, weakness, excessive sweating. **Cardiovascular:** Angina/myocardial infarction, cerebrovascular accident, hypertensive crisis, rhythm disturbances, palpitations, hypotension, syncope, flushing, claudication. Orthostatic hypotension occurred in 1.4% of patients treated with fosinopril monotherapy. Hypotension or orthostatic hypotension was a cause for discontinuation of therapy in 0.1% of patients. **Dermatologic:** Urticaria, rash, photosensitivity, pruritus. **Endocrine/Metabolic:** Gout, decreased libido. **Gastrointestinal:** Pancreatitis, hepatitis, dysphagia, abdominal distention, abdominal pain, flatulence, constipation, heartburn, appetite weight change, dry mouth. **Hematology:** Lymphadenopathy. **Immunologic:** Angioedema. **Musculoskeletal:** Arthralgia, musculoskeletal pain, myalgia/muscle cramp. **Nervous/Psychiatric:** Memory disturbance, tremor, confusion, mood change, paresthesia, sleep disturbance, drowsiness, vertigo. **Respiratory:** Bronchospasm, pharyngitis, sinusitis/rhinitis, laryngitis/hoarseness, epistaxis. A symptom-complex of cough, bronchospasm and eosinophilia has been observed in two patients treated with fosinopril. **Special Senses:** Tinnitus, vision disturbance, taste disturbance, eye irritation. **Urogenital:** Renal insufficiency, urinary frequency. **Potential Adverse Effects Reported with ACE Inhibitors:** Other medically important adverse effects reported with ACE inhibitors include: Cardiac arrest; eosinophilic pneumonitis; neutropenia/agranulocytosis, pancytopenia, anemia (including hemolytic and aplastic), thrombocytopenia; acute renal failure; hepatic failure, jaundice (hepatocellular or cholestatic); symptomatic hyponatremia; bullous pemphigoid, exfoliative dermatitis; a syndrome which may include: arthralgia/arthritis, vasculitis, serositis, myalgia, fever, rash or other dermatologic manifestations, a positive ANA, leukocytosis, eosinophilia, or an elevated ESR. **Laboratory Test Abnormalities:** Serum Electrolytes: Hyperkalemia (see PRECAUTIONS); hyponatremia (see PRECAUTIONS). Drug Interactions: (With diuretics). **BUN/Serum Creatinine:** Elevations, usually transient and minor, of BUN or serum creatinine have been observed. In placebo-controlled clinical trials, there were no significant differences in the number of patients experiencing increases in serum creatinine (outside the normal range or 1.33 times the pretreatment value) between the fosinopril and placebo treatment groups. Rapid reduction of longstanding or markedly elevated blood pressure by any antihypertensive therapy can result in decreases in the glomerular filtration rate and, in turn, lead to increases in BUN or serum creatinine. (See PRECAUTIONS: General.) **Hematology:** In controlled trials, a mean hemoglobin decrease of 0.1 g/dL was observed in fosinopril-treated patients. In individual patients decreases in hemoglobin or hematocrit were usually transient, small, and not associated with symptoms. No patient was discontinued from therapy due to the development of anemia. **Other:** Neutropenia (see WARNINGS), leukopenia and eosinophilia. **Liver Function Tests:** Elevations of transaminases, LDH, alkaline phosphatase and serum bilirubin have been reported. Fosinopril therapy was discontinued because of serum transaminase elevations in 0.7% of patients. In the majority of cases, the abnormalities were either present at baseline or were associated with other etiologic factors. In those cases where they were possibly related to fosinopril therapy, the elevations were generally mild and transient and resolved after discontinuation of therapy.

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the most part, become the standard item type for most examinations. Although most aspects of cognitive educational achievement can be tested by any of the item formats mentioned earlier with almost identical results,⁶ the multiple-choice question offers many advantages and has gained widespread acceptance. We, as educators, would do well to master it.

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A serious accident. A serious loss.

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this child will only feel
his mother's love,
his mother's tenderness.

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