

**Medicine:**

**PreTest<sup>®</sup> Self-Assessment  
and Review**

Third Edition

Edited by

**John M. Dwver, M.D., Ph.D.**

# Medicine:

## PreTest<sup>®</sup> Self-Assessment and Review

Third Edition

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# Medicine

### Notice

Medicine is an ever-changing science. As new research and clinical experience broaden our knowledge, changes in treatment and drug therapy are required. The editors and the publisher of this work have checked with sources believed to be reliable in their efforts to provide drug dosage schedules that are complete and in accord with the standards accepted at the time of publication. However, readers are advised to check the product information sheet included in the package of each drug they plan to administer to be certain that the information contained in these schedules is accurate and that changes have not been made in the recommended dose or in the contraindications for administration. This recommendation is of particular importance in connection with new or infrequently used drugs.

# Introduction

*Medicine: PreTest Self-Assessment and Review*, 3rd Ed., has been designed to provide medical students, as well as physicians, with a comprehensive and convenient instrument for self-assessment and review within the field of epidemiology and public health. The 500 questions provided have been designed to parallel the format and degree of difficulty of the questions contained in Part II of the National Board of Medical Examiners examinations, the Federal Licensing Examination (FLEX), and the Foreign Medical Graduate Examination in the Medical Sciences (FMGEMS).

Each question in the book is accompanied by an answer, a paragraph explanation, and a specific page reference to either a current journal article, a textbook, or both. A bibliography that lists all the sources used in the book follows the last chapter.

Perhaps the most effective way to use this book is to allow yourself one minute to answer each question in a given chapter; as you proceed, indicate your answer beside each question. By following this suggestion, you will be approximating the time limits imposed by the board examinations previously mentioned.

When you have finished answering the questions in a chapter, you should then spend as much time as you need verifying your answers and carefully reading the explanations. Although you should pay special attention to the explanations for the questions you answered incorrectly, you should read every explanation. The authors of this book have designed the explanations to reinforce and supplement the information tested by the questions. If, after reading the explanations for a given chapter, you feel you need still more information about the material covered, you should consult and study the references indicated.

This book meets the criteria established by the AMA's Department of Continuing Medical Education for up to 22 hours of credit in category 5D for the Physician's Recognition Award. It should provide an experience that is instructive as well as evaluative; we also hope that you enjoy it. We would be very happy to receive your comments.

# Preface

Regular new additions of self-assessment books for physicians are essential if they are to present a balanced coverage of important new as well as classical knowledge in the various disciplines we strive to master. The pace with which useful, that is, applicable, medical knowledge is accumulating is at the same time exciting and daunting. By using books such as this, medical students and physicians can, we hope, determine the areas of medicine that require more of their attention. In our field, if not all highly technical fields, continuing education remains the only way to the genuine competency that generates professional self-satisfaction.

For this edition a substantial number of new questions are in place. Each has been carefully chosen to cover important current topics. We have scanned the various reviews of medicine and leading journal editorials and have sought the emphasis within new editions of the major textbooks to determine the subject matter to be covered. In addition, specialists in each subspecialty have been polled to provide us with their opinions of the significant advances that have occurred within their areas in the time since the second edition of this text. The result, we believe, is a book that accurately fulfills its purpose: to allow you to assess your state of important medical knowledge.

Many of the references to the questions that have not been changed have been altered since the second edition to direct reading to more popular texts that are likely to be within easy reach, and every question has a reference for the relevant material contained in the 10th edition of *Harrison's Principles of Internal Medicine*. Inevitably, given that this is a general textbook, much of the material we feel is important will need an additional text for in-depth reading. Suggestions for appropriate sources are included.

It can be fun to run through a chapter at a time with some colleagues or one's students. The book is definitely not intended only for those preparing for an examination. We would appreciate any comments that would help us to do better in the future. No one knows the answers to all the questions in this book, so relax, enjoy, and learn; your patients will thank you.

J.M.D.

# Contents

<b>Introduction</b>	vii
<b>Preface</b>	ix
<b>Allergy and Immunology</b>	
Questions	1
Answers, Explanations, and References	10
<b>Infectious Disease</b>	
Questions	24
Answers, Explanations, and References	41
<b>Rheumatology</b>	
Questions	61
Answers, Explanations, and References	69
<b>Pulmonary Disease</b>	
Questions	81
Answers, Explanations, and References	87
<b>Cardiology</b>	
Questions	95
Answers, Explanations, and References	116
<b>Endocrinology and Metabolic Disease</b>	
Questions	140
Answers, Explanations, and References	158
<b>Gastroenterology</b>	
Questions	178
Answers, Explanations, and References	191
<b>Diseases of the Urinary Tract</b>	
Questions	205
Answers, Explanations, and References	211
<b>Oncology and Hematology</b>	
Questions	218
Answers, Explanations, and References	226



**Neurology**

Questions

241

Answers, Explanations, and References

248

**Dermatology**

Questions

256

Answers, Explanations, and References

262

**Bibliography**

269

# Allergy and Immunology

**DIRECTIONS:** Each question below contains five suggested answers. Choose the **one best** response to each question.

1. Which of the following statements about the administration and/or use of intravenous gammaglobulin is correct?
  - (A) The administration of high doses may produce a remission in the idiopathic thrombocytopenic purpura
  - (B) It must be administered slowly, as concentrated gammaglobulin used intravenously has spontaneous anticomplementary activity
  - (C) Intravenous gammaglobulin preparations are safe and effective in the management of patients with selective IgA deficiency
  - (D) Intravenous gammaglobulin preparations have been associated with the development of acquired immune deficiency syndrome (AIDS)
  - (E) In calculating the dose of intravenous gammaglobulin to be administered the physician should take into account the fact that the half-life of the immunoglobulin in the product is 7 to 12 days in vivo.
2. Selective IgA deficiency is the most common of all immunodeficiency states. Study of patients who have this problem has revealed that
  - (A) they may suffer anaphylactic reactions following the administration of serum products
  - (B) encouraging improvements in health follows regular infusions of fresh plasma
  - (C) secretory component is usually increased in an attempt to compensate for lack of secretory IgA
  - (D) there is an increase in 19S IgM in the secretions of certain affected patients
  - (E) a few of them may have associated autoimmune disorders

3. Which of the following statements about assessment of immunoglobulin in cerebrospinal fluid is true?
- (A) It may aid in the diagnosis of cerebral systemic lupus erythematosus
  - (B) It may lead to a suspicion of multiple sclerosis if IgM levels are elevated.
  - (C) It may distinguish subacute sclerosing panencephalitis from multiple sclerosis
  - (D) It normally reveals that 5 to 10 percent of the cerebrospinal fluid protein is IgG
  - (E) It becomes more useful if the total cerebrospinal fluid protein exceeds 100 mg/100 ml
4. During the primary immune response a network of interactions are required for the successful elimination of antigen. During this process, which of the following occurs?
- (A) T8 positive lymphocytes stimulate macrophages to release interleukin 2
  - (B) T4 positive lymphocytes stimulate macrophages to release interleukin 1
  - (C) B lymphocytes react with antigen and interleukin 1 and then secrete immunoglobulin M
  - (D) Antigen-presenting macrophages present antigens to lymphocyte-activating macrophages
  - (E) IgA antibodies are secreted by plasma cells that have interacted with secretory piece
5. Which of the following statements about the presence of circulating anti-deoxyribonucleoprotein in the serum of patients who have systemic lupus erythematosus is true?
- (A) It is associated with the presence of LE cells
  - (B) It is associated with leukopenia since the antibody reacts with neutrophil membrane antigens
  - (C) It is rarely associated with high titers of antinuclear factor
  - (D) It is an indication that severe membranous glomerulonephritis is likely to be present
  - (E) It is unusual inasmuch as this antibody generally is associated with scleroderma
6. Which of the following statements about allergic reactions in patients receiving up to 20 g of penicillin per day is true?
- (A) Allergic reactions occur in 20 percent of patients receiving the drug for the second time
  - (B) Allergic reactions may be anaphylactoid if IgE class antibodies to penicilloyl-P are present in the serum
  - (C) Allergic reactions will be less likely to occur if IgM antipenicilloyl antibodies are present in the serum
  - (D) Allergic reactions are unlikely to be anaphylactoid if the patient does not get a wheal and flare reactions when penicilloyl-D-lysine is introduced intradermally
  - (E) Allergic reactions can be complicated by hemolytic anemias when prolonged administration provokes the development of red blood cell autoantibodies

7. Alpha-methyldopa (Aldomet) may cause an autoimmune hemolytic anemia. This complication is associated with
- (A) the development of high titers of antinuclear factor
  - (B) a strongly positive indirect Coombs' (antiglobulin) test
  - (C) the development of an autoantibody with specificity for the Rh locus
  - (D) a slow but consistent reversal of the hemolytic process if the drug is withdrawn
  - (E) the binding of the drug to the red blood cell membrane, which produces an immunogenic hapten protein conjugate
8. A 40-year-old man presents with a three-month history of headache, sinusitis, and rhinorrhea. He has had two episodes of hemoptysis and some respiratory discomfort. On examination, he has some nasal mucosal ulcerations. His blood urea nitrogen is 60 mg per 100 ml. A biopsy of the swollen tissue in the patient's nose yields results consistent with a diagnosis of Wegener's granulomatosis. All the following histological features can be expected to be associated with this condition EXCEPT for
- (A) vasculitis affecting the small arterioles
  - (B) vasculitis involving venules and some capillaries
  - (C) deposition in blood vessels of immunoglobulin and, possibly, immune complexes
  - (D) necrotizing inflammation in which all affected vessels show the same degree of inflammation
  - (E) numerous giant cells in granulomata
9. Plasmapheresis is used in the management of such diseases as myasthenia gravis, systemic lupus erythematosus, and idiopathic thrombocytopenic purpura. Which of the following statements about this form of therapy is true?
- (A) It is used only when hypergammaglobulinemia is present
  - (B) It is hazardous in patients with anemia
  - (C) It is of little use in patients receiving prednisone or immunosuppressive agents
  - (D) It is effective only in adults
  - (E) It can produce clinical improvement in less than 24 hours
10. Acquired hypogammaglobulinemia results in a marked increase in the frequency and severity of bacterial infections. Current evidence suggests that the pathogenesis of this disease may be related to
- (A) the administration of gammaglobulin in the first few months of life
  - (B) failure of stem cell differentiation to B lymphocytes in the bone marrow
  - (C) a failure of helper T cells to collaborate with B lymphocytes in the production of antibody
  - (D) abnormally rapid shedding of B-cell receptors for antigen with subsequent poor recognition of an antigenic presence
  - (E) the abnormal activation of suppressor T cells that block B-cell production of an antibody secreting system

11. A 60-year-old man experiences a sudden onset of severe lower back pain; he gives a history of recent weight loss and a first attack of gout. An immunoelectrophoretic strip reveals a monoclonal gammopathy. Which of the following statements about this patient is most likely to be true?

- (A) The monoclonal immunoglobulin will be of the IgM class
- (B) Ten to fifteen percent of the patient's bone marrow cells will be plasma cells
- (C) A polyclonal increase in the immunoglobulin classes not involved in the gammopathy also will be present
- (D) The patient's urine will contain large amounts of free monoclonal kappa chains
- (E) Gammaglobulin therapy is unlikely to be of any help

12. A 15-year-old girl presents with a clinical syndrome that is indistinguishable from viral hepatitis; however, her history and serological findings do not support a viral etiology for her problem. Liver biopsy reveals an established active cirrhosis and hepatocellular necrosis associated with a heavy infiltrate of plasma cells and lymphocytes. Which of the following statements about this girl's condition is most likely to be true?

- (A) B lymphocytes are likely to carry the histocompatibility antigen B7
- (B) She probably has a total immunoglobulin level that exceeds 4 g/100 ml
- (C) She probably has antimitochondrial antibodies
- (D) High titers of anti-smooth muscle antibodies are likely to appear transiently at the onset of her illness
- (E) She will probably recover spontaneously after six months of illness

13. The 6th chromosome in humans carries A, B, C, and D loci that contain genes whose products are detected as histocompatibility antigens on the surface of most cells in the body. The association of certain diseases with specific alleles at these loci may correctly be said to

- (A) have been made possible by the development of mixed leukocyte reactions with pooled normal cells
- (B) be best exemplified by the association of the B27 antigen with ankylosing spondylitis and psoriatic arthritis
- (C) be explained by linkage disequilibrium of these alleles to immunoregulatory alleles
- (D) suggest that viruses can trigger certain diseases by utilizing these histocompatibility antigens as receptors through which to gain entry to cells
- (E) occur much more frequently in women than in men

14. Immune complexes can produce severe pathologic reactions in such structures as blood vessels, joints, and basement membranes. Which of the following statements concerning the major mechanism actually causing the tissue damage is true?

- (A) It results from the release of cytotoxic lymphokines from T cells triggered by the complexes
- (B) It results from a direct cytotoxic effect of activated complement components  $C\bar{5}$ ,  $C\bar{6}$ , and  $C\bar{7}$
- (C) It results from the release by tissue mast cells of slow-reacting substance of anaphylaxis, increasing vascular permeability
- (D) It results from the release of lysosomal enzymes from polymorphonuclear leukocytes
- (E) It can be blocked if sufficient vasoactive amines can be released from lysed platelets

15. A 6-year-old white male presents to his physician with a history of recurrent staphylococcal infections (including osteomyelitis), chronic severe eczema, and asthma complicated by allergic rhinitis. If the boy has the hyper-IgE syndrome, it is likely that

- (A) his IgE level (normally less than 300 ng/ml) will be between 2000 and 5000 ng/ml
- (B) his father will have suffered from similar problems as a child
- (C) a chemotactic defect of polymorphonuclear cells will be discovered
- (D) he will respond well to levamisole
- (E) a B-cell, but not a T-cell, defect will be demonstrable

16. A 24-year-old woman who is investigated by an endocrinology unit is discovered to have primary ovarian failure and diabetes. This syndrome would be expected to be associated with all the following factors EXCEPT

- (A) premature graying of hair
- (B) vitiligo
- (C) a mother with proven pernicious anemia
- (D) antibodies reactive with salivary glands
- (E) antibodies reactive with thyroglobulin

17. A 34-year-old hemophiliac who has received factor VIII infusions regularly for six years now complains of the gradual onset of fatigue, night sweats, arthralgias, and a ten-pound weight loss over a three-month period. In working up his case it is most likely that the physician will find that

- (A) this patient has *Pneumocystis carinii* pneumonia
- (B) examination of the patient's skin will reveal signs of Kaposi's sarcoma
- (C) an increased number of T8 positive lymphocytes will be found circulating in his peripheral blood
- (D) he has had at least one homosexual encounter
- (E) his quantitative immunoglobulin levels will be suppressed

**DIRECTIONS:** Each question below contains four suggested answers of which **one or more** is correct. Choose the answer:

A	if	<b>1, 2, and 3</b>	are correct
B	if	<b>1 and 3</b>	are correct
C	if	<b>2 and 4</b>	are correct
D	if	<b>4</b>	is correct
E	if	<b>1, 2, 3, and 4</b>	are correct

18. Antibodies that act as circulating anticoagulants demonstrate which of the following characteristics?

- (1) They usually are IgM in character
- (2) They increase rapidly in the serum after exposure to blood or blood products
- (3) They may be present for years in apparently normal postpartum women
- (4) In patients who have systemic lupus erythematosus, they are often directed against activated factor X

19. Correct statements about asthma (reversible airways obstruction) include which of the following?

- (1) It is associated with deficient alpha-adrenergic receptor function
- (2) It is frequently associated with respiratory syncytial virus infections early in life
- (3) Affected patients suffering attacks in which  $P_{CO_2}$  levels remain normal are unlikely to require hospitalization
- (4) It is associated with an increased bronchial sensitivity to slow-reacting substance of anaphylaxis and to bradykinin

20. Primary biliary cirrhosis commences with a granulomatous destruction of the epithelium of the proximal hepatic biliary tree. However, there is considerable evidence to suggest that this disease is a multisystem autoimmune disease. The evidence for this statement includes

- (1) the presence of antibody to mitochondrial antigens in the serum
- (2) the finding that 70 to 100 percent of patients have lacrimal and salivary gland inflammation
- (3) the demonstration of increased catabolism of the complement components C1q and C3
- (4) scleroderma-like skin thickening as a common and prominent feature

21. Hereditary angioneurotic edema is associated with which of the following statements?

- (1) It results from the presence of abnormally high levels of IgE
- (2) It is frequently associated with severe abdominal cramps
- (3) It is sometimes associated with the release of massive amounts of histamine
- (4) During an attack it is frequently associated with the consumption of the natural substrates for C1, C4, and C2



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**SUMMARY OF DIRECTIONS**

A	B	C	D	E
1,2,3 only	1,3 only	2,4 only	4 only	All are correct

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22. Bone marrow-derived B lymphocytes exhibit which of the following characteristics?

- (1) They are the proliferating cells in chronic lymphocytic leukemia
- (2) They carry a surface membrane receptor for the Fc portion of IgG
- (3) They carry a surface membrane receptor for the breakdown products of the third component of complement
- (4) They have a receptor for the Epstein-Barr virus

23. Correct statements about multiple sclerosis (MS) include which of the following?

- (1) Suppression of CSF immunoglobulin production leaves the central nervous system vulnerable to viral infection
- (2) Suppressor T cells are drastically reduced in the blood of patients experiencing an acute flare-up of MS
- (3) Oligoclonal binding in CSF is virtually diagnostic for MS, as it otherwise occurs only in the easily distinguished cryptococcal meningitis
- (4) More than 50 percent of MS patients can be shown to be synthesizing antibody to the measles virus in their brain

24. Once activated, individual components of the classical pathway for complement are capable of-

- (1) enhancing polymorphonuclear cell phagocytosis
- (2) lysing cell membranes
- (3) interacting with kinin and fibrolytic systems
- (4) neutralizing viruses

25. A 24-year-old woman has a severe anaphylactic reaction following a honeybee sting. She recovers, but is surprised and disappointed at her reaction since she had completed a course of desensitization with whole-body extract. In discussing the future management of this problem, the physician would be correct in telling the patient that

- (1) she should have a skin test with whole-body extract and, if the result is positive, she should try a second course of desensitizing injections with this antigenic preparation
- (2) she should not be alarmed about the situation because, despite the fact that there are hundreds of thousands of bee stings a year in the United States, only 50 to 60 deaths are reported annually
- (3) even if she is stung after another course of desensitization and no immediate reaction occurs, she should watch for a delayed reaction for at least two hours after the sting
- (4) most reactions appear to occur because of sensitivity to bee and hornet venom