

- 13 comprehensive 50-question practice tests simulate the USMLE Step 1
- 650 USMLE Step 1-type questions with complete explanations
- Covers all core topics on the Step 1 exam





Second Edition

McGraw-Hill

Medical Publishing Division

Lange Practice Tests™: USMLE Step 1, Second Edition

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234567890 QPD/QPD 09876

ISBN 0-07-144615-X

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This book was set in Palatino by Rainbow Graphics
The editors were Catherine A. Johnson and Marsha S. Loeb.
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This book is printed on acid-free paper.

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Preface

Lange Practice Tests: USMLE Step 1 was designed to be an up-to-date mirror of the Step 1 examination. The content and question types are designed around the current USMLE guidelines.

The questions are original and were produced by a faculty of clinicians who are both experts in their respective fields and physicians who are deeply involved with current teaching programs at their medical institutions. In this manner, you, the medical student, are assured of material that is both appropriate and accurate.

This guide will help you immensely in your studies for the USMLE Step 1 examination. Good luck on your exam!

Joel S. Goldberg Philadelphia, Pennsylvania

Acknowledgments

I would like to extend my sincere appreciation to my editor, Ms. Catherine Johnson, for her assistance in the development of this project, along with the many staff members of McGraw-Hill who participated in this work. I also wish to thank the physicians who participated in this project. They were able to find the time in their busy schedules to help in the creation of this work, which will benefit medical students across the United States.

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Practice Test 1

Questions

DIRECTIONS (Questions 1 through 50): Each of the numbered items or incomplete statements in this section is followed by answers or by completions of the statement. Select the ONE lettered answer or completion that is BEST in each case.

- 1. A 72-year-old hypertensive man presents with acute onset of expressive aphasia and right hemiparesis affecting the face and arm more than the leg. Which of the following cerebral blood vessels is likely to be occluded?
 - (A) left anterior cerebral artery
 - (B) left middle cerebral artery
 - (C) left posterior cerebral artery
 - (D) right vertebral artery
 - (E) basilar artery
- 2. A 71-year-old hypertensive woman presents with acute onset of Horner's syndrome, right face and left body sensory loss, dysphagia, dysarthria, and right limb dysmetria. Which of the following cerebral blood vessels is likely to be occluded?
 - (A) left anterior cerebral artery
 - (B) left middle cerebral artery
 - (C) left posterior cerebral artery
 - (D) right vertebral artery
 - (E) basilar artery
- 3. A 64-year-old woman is admitted to the hospital with change in mental status. On exam, she has loss of the lateral third of her eyebrows. Which of the following does she most likely have?

- (A) adrenal insufficiency
- (B) pheochromocytoma
- (C) hypothyroidism
- (D) hyperparathyroidism
- (E) thyroid cancer
- **4.** A 45-year-old woman presents with pretibial myxedema. Her laboratory studies will most likely reveal which of the following?
 - (A) high thyroid-stimulating hormone (TSH) and low free thyroxine (T_4)
 - (B) high TSH and high free T₄
 - (C) low TSH and low free T₄
 - (D) low TSH and high free T₄
 - (E) normal TSH and normal free T₄
- 5. A 60-year-old postmenopausal woman sustains a hip fracture. Results of a bone density study are consistent with severe osteoporosis. Which of the following therapeutic agents does not inhibit osteoclastic activity in bone?
 - (A) conjugated equine estrogen
 - (B) 1,25-dihydroxyvitamin D [1,25(OH)2D]
 - (C) calcitonin
 - (D) alendronate
 - (E) Miacalcin nasal spray
- 6. What is the most likely diagnosis in a 62-yearold man who has smoked cigarettes since the age of 15 and has a lesion on his lip?
 - (A) basal cell carcinoma
 - (B) squamous cell carcinoma
 - (C) sarcoidosis
 - (D) bite fibroma
 - (E) melanoma

- 7. A 59-year-old woman presents to your office complaining of a 2-month history of early satiety and abdominal bloating. On pelvic exam you detect a 6-cm right adnexal mass and mild abdominal distention with a an air-fluid wave on abdominal exam. Subsequent pelvic ultrasound shows a complex right adnexal mass with a normal left adnexal and uterus as well as a moderate amount of ascites. Assuming that the patient's diagnosis is an ovarian malignancy, which of the following blood tests would you expect to be abnormal in this patient?
 - (A) alpha-fetoprotein (AFP)
 - (B) beta subunit of human chorionic gonadotropin (B-hCG)
 - (C) estradiol
 - (D) CA 125
 - (E) CEA
- 8. A 75-year-old man presents with a 6-month history of progressive difficulty ambulating. There is no history of trauma or leg pain. He has noticed that he has to lean against the wall as he walks, or he will lose his balance and fall. On exam he has hyperreflexic lower extremities, 4/5+ lower extremity muscle weakness, and stiffness in his cervical and lumbar spines. His chest expansion is normal. Which of the following best describes this patient's condition?
 - (A) enlarging glioma of the cerebellum
 - (B) large herniated lumbar disk
 - (C) Parkinson's disease
 - (D) cervical spondylosis with myelopathy
 - (E) Friedreich's ataxia
- **9.** Rupture of the posterior tibial tendon can lead to
 - (A) inversion of the foot with heightening of the arch
 - (B) flattening of the arch and a valgus position of the hindfoot
 - (C) fixed plantar flexion of the foot
 - (D) fixed varus of the hindfoot
 - (E) fixed dorsiflexion of the foot

- **10.** To differentiate osteoporosis from some other metabolic bone disease, which of the following laboratory tests could be obtained?
 - (A) glucose
 - (B) vitamin B₆
 - (C) luteinizing hormone (LH)
 - (D) follicle-stimulating hormone (FSH)
 - (E) serum protein electrophoresis
- **11.** The biceps muscle performs which of the following?
 - (A) forearm flexion
 - (B) forearm extension
 - (C) forearm flexion and supination
 - (D) forearm flexion and pronation
 - (E) forearm extension and supination
- 12. The clinical spectrum of narcolepsy may include all of the following symptoms. Which of the symptoms refers to profound muscle weakness without loss of consciousness?
 - (A) disturbed nocturnal sleep
 - (B) cataplexy
 - (C) daytime somnolence
 - (D) hypnagogic hallucinations
 - (E) sleep paralysis
- **13.** The sciatic nerve exits the sciatic notch of the pelvis beneath what muscle shown in Figure 1.1?
 - (A) quadratus femoris muscle
 - (B) gemellus muscles
 - (C) psoas muscle
 - (D) piriformis muscle
 - (E) posterior tibialis
- **14.** If a pulmonary embolism (PE) is clinically suspected and the patient is symptomatic, what is the initial treatment?
 - (A) anticoagulation with aspirin alone
 - (B) anticoagulation with heparin or enoxaparin
 - (C) anticoagulation with Coumadin alone

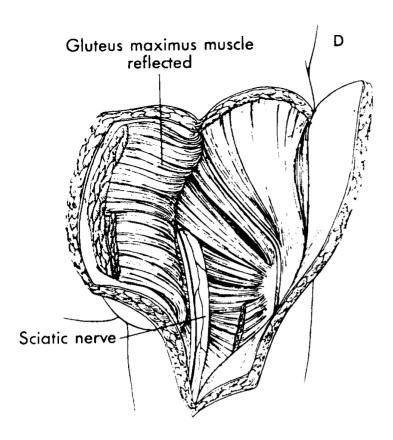


Figure 1.1

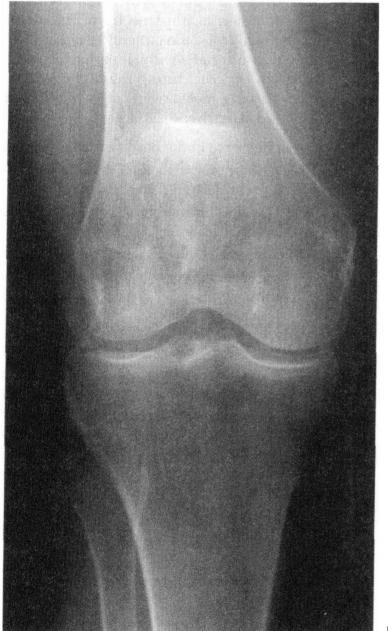
- (D) anticoagulation must be held until an absolute diagnosis of PE is made
- (E) embolectomy
- **15.** Which of the following hormones inhibits osteoclast breakdown of bone?
 - (A) thyroid hormone
 - (B) parathyroid hormone (PTH)
 - (C) calcitonin
 - (D) corticosteroids
 - (E) creatine
- **16.** Which of the following is the dominant hormonal influence on the endometrium in the proliferative phase of the menstrual cycle?
 - (A) estrogen
 - (B) progesterone
 - (C) testosterone
 - (D) cortisol
 - (E) testosterone
- 17. A 70-year-old man presents with weakness and a 30-pound weight loss over 1 year. He also has a history of vague upper abdominal

pain, back pain, and intermittent diarrhea. Physical exam reveals a cachectic-appearing man with scleral icterus. His hematocrit is 28%, with a total bilirubin of 3 mg/dL. Which of the following is the most likely diagnosis?

- (A) carcinoma of the transverse colon with hepatic metastasis
- (B) chronic cholecystitis with bile duct stones
- (C) duodenal ulcer with pancreatic penetration
- (D) carcinoma of the pancreas
- (E) renal carcinoma
- 18. A 65-year-old patient with emphysema flies in a commercial airplane from Philadelphia to Denver. While the patient's oxygen saturation was normal in Philadelphia at rest, he becomes hypoxic during the flight. Which of the following mechanisms most likely results in the patient's hypoxemia?
 - (A) a decrease in the barometric air pressure
 - (B) ventilation–perfusion (V/Q) mismatch from underlying emphysema
 - (C) diffusion limitation of oxygen from interstitial scarring
 - (D) a decrease in the Fio₂ in the airplane cabin
 - (E) enhancement of shunt physiology due to altitude
- 19. A 34-year-old man is seen in the emergency department (ED) after having been found unresponsive by a friend. The patient is obtunded and has evidence of emesis and odor of alcohol. Track marks are noted on the forearms and antecubital fossa. The arterial blood gas shows a pH of 7.15, Paco₂ of 90, and Pao₂ of 50. The patient's reduced oxygen tension is most likely due to
 - (A) aspiration pneumonitis following alcohol binge
 - (B) *Pneumocystis carinii* pneumonia (PCP) from human immunodeficiency virus (HIV)
 - (C) hypoventilation from narcotic overdose
 - (D) hypercapneic respiratory failure due to chronic obstructive pulmonary disease (COPD) exacerbation
 - (E) starvation ketoacidosis

- 20. A patient with acute respiratory distress syndrome (ARDS) on controlled mechanical ventilatory support develops progressive hypercapnea, despite a stable minute ventilation over the past several days. Which of the following interventions likely aggravated this?
 - (A) decreasing the respiratory rate to prevent auto-positive end-expiratory pressure (PEEP)
 - (B) initiation of enteral feeding for nutritional support

- (C) discontinuation of steroids used inititally to treat bronchospasm
- (D) decreasing the tidal volume during attempts at weaning
- (E) increasing sedation due to the patient's being agitated and developing ventilator dyssynchrony
- 21. An 85-year-old woman presents with acute onset of knee pain with swelling. Her white blood cell (WBC) count is 13,000, and her knee has a 3+ effusion and is warm to the



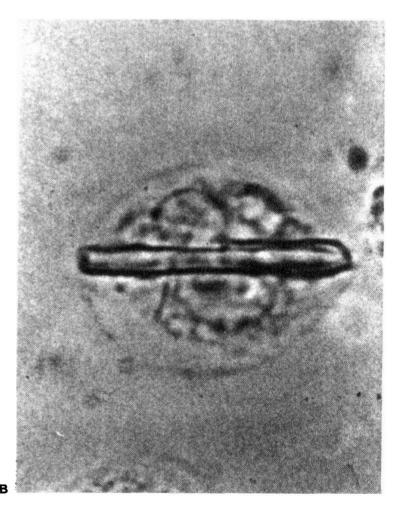


Figure 1.2 A and B (Reproduced, with permission, from Klippel JH (ed). *Primer on the Rheumatic Diseases*, 11th ed. Atlanta, GA: Arthritis Foundation, 1997: 227 [Figure 16.2].)

Δ

touch. An x-ray of her knee and a photomicrograph of her knee aspirate are shown in Figure 1.2 A and B. Which of the following is the most likely diagnosis?

- (A) septic arthritis
- (B) gouty arthritis
- (C) pseudogout
- (D) rheumatoid arthritis
- (E) Lyme arthritis
- 22. A 16-year-old girl is seen in an ED for increasing shortness of breath. On exam, she is tachypneic and febrile to 38.3°C (101°F), with skin pallor. Her WBC is 100,000/μL with 95% lymphoblasts. A chest x-ray is obtained showing which of the following?
 - (A) bilateral pleural effusions
 - (B) cardiomegaly
 - (C) a mediastinal mass
 - (D) right lobar pneumonia
 - (E) diffuse pulmonary fibrosis
- **23.** Scurvy results from deficiency of which vitamin?
 - (A) vitamin A
 - (B) vitamin C
 - (C) vitamin D
 - (D) thiamine
 - (E) folate
- 24. A 70-year-old woman is admitted to the intensive care unit (ICU) for respiratory failure due to a severe community-acquired pneumonia. Which of the following is insignificant in affecting the shift of her oxygen-hemoglobin dissociation curve shown in Figure 1.3?
 - (A) acidemia
 - (B) hypophosphatemia
 - (C) fever
 - (D) lung consolidation
 - (E) pH
- 25. An intravenous drug user develops fever, heart murmur, and tender papules on the palms. Which of the following is the most likely diagnosis of the palmar lesions?

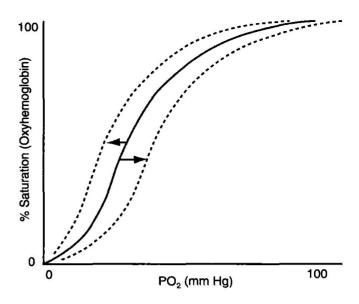


Figure 1.3

- (A) Lisch nodules
- (B) Osler's nodes
- (C) Gottron's papules
- (D) Auspitz sign
- (E) Henderson-Patterson bodies
- **26.** Figure 1.4 shows which of the following conditions?
 - (A) peptic ulcer disease
 - (B) Barrett's esophagus
 - (C) erosive esophagitis
 - (D) Helicobacter pylori infection
 - (E) normal anatomy

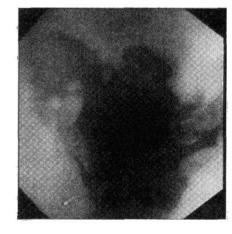


Figure 1.4
(Reproduced, with permission, from Friedman SL, McQuaid KR, Grendell JH. Current Diagnosis & Treatment in Gastroenterology. New York: McGraw-Hill, 2003: 278.)

- **27.** Which of the following patients should undergo colorectal cancer screening?
 - (A) a 25-year-old man with no family history of colon cancer but who notes occasional blood-streaked toilet paper
 - (B) a 55-year-old man without a family history of colon cancer
 - (C) an 80-year-old man with a negative colonoscopic examination 2 years ago who presents to your office requesting a repeat colonoscopy
 - (D) a 35-year-old woman noted to have irondeficiency anemia
 - (E) a 17-year-old male with stomach pain
- 28. A 43-year-old obese diabetic woman was readmitted to the hospital for a severe wound infection following an open cholecystectomy. Despite appropriate management of the wound infection, her pain remained difficult to control, and a maintenance continuous infusion of meperidine with patient-controlled analgesia (PCA) was started. The patient and her wounds began to recover nicely when on hospital day 4 she developed seizures that were difficult to arrest. After control of her convulsions and stabilization, what is the next most appropriate step?
 - (A) Obtain a magnetic resonance imaging (MRI) scan of the head with attention to the temporal lobes.
 - (B) Start broad-spectrum antibiotics.
 - (C) Discontinue meperidine.
 - (D) Initiate phenytoin for life.
 - (E) Initiate Tegretol for life.
- **29.** Which of the following statements is true regarding the synthesis of estrogens and androgens in males?
 - (A) Very little circulating testosterone is secreted from the Leydig cells of the testes.
 - (B) A negligible amount of circulating dihydrotestosterone (DHT) is formed by peripheral conversion of its precursors.
 - (C) The majority of circulating estradiol is not formed from peripheral conversion of its precursors.

- (D) The majority of circulating dehydroepiandrosterone sulfate (DHEAS) is secreted by the adrenals.
- (E) There is no estradiol in males.
- **30.** A positive test for antineutrophil cytoplasmic antibody (ANCA) is most commonly found in which of the following conditions?
 - (A) systemic lupus erythematosus (SLE)
 - (B) Sjögren's syndrome
 - (C) dermatomyositis
 - (D) Wegener's granulomatosis
 - (E) neurofibromatosis
- **31.** Which of the following terms best describes a nerve injury in which structures within the perineurium and endoneurial tubes are disrupted and regeneration is disorderly?
 - (A) neurotmesis
 - (B) neurapraxia
 - (C) axonotmesis
 - (D) axesis
 - (E) dermatofibrosis
- **32.** Which of the following glands is derived from the embryonal neuroectoderm?
 - (A) adrenal cortex
 - (B) anterior pituitary
 - (C) posterior pituitary
 - (D) parathyroid glands
 - (E) pancreas
- **33.** Which disease is most likely to be associated with elevated titers of voltage-gated calcium channel antibody?
 - (A) myasthenia gravis
 - (B) Lambert-Eaton myasthenic syndrome
 - (C) paraneoplastic polyneuropathy
 - (D) myotonia congenita
 - (E) Guillain-Barré syndrome
- 34. Which of the following immunomodulating agents used in the treatment of multiple sclerosis may exert its effect by blocking alphaintegrin?

- (A) cyclosporine
- (B) azathioprine
- (C) mitoxantrone
- (D) natalazumab
- (E) glatiramer acetate
- 35. A 52-year-old patient has type 2 diabetes mellitus controlled with diet alone. Due to poor sugar control, a decision is made to add an oral hypoglycemic agent. Two weeks later, the patient complains of a deep aching pain over the anterior thigh and lower back. Skin is sensitive to touch over the medial thigh. Exam reveals atrophy and 3/5 weakness of the quadriceps and iliopsoas muscles, sparing the adductor magnus and all distal muscles in the leg. The knee jerk is absent on the affected side. Which nerve has been compromised?
 - (A) sciatic
 - (B) obturator
 - (C) femoral
 - (D) tibial
 - (E) superior gluteal
- **36.** Which of the following is the most common anatomic lesion for the pathology associated with complex partial epilepsy?
 - (A) amygdala
 - (B) hippocampus
 - (C) supplementary motor cortex
 - (D) Purkinje cell
 - (E) hypothalamus
- 37. Which of the following would best distinguish an otherwise healthy person with severe water deprivation from a person with the syndrome of inappropriate antidiuretic hormone secretion (SIADH)?
 - (A) urine osmolarity
 - (B) plasma osmolarity
 - (C) circulating levels of antidiuretic hormone (ADH)
 - (D) corticopapillary osmotic gradient
 - (E) chest x-ray

- 38. A 40-year-old carpenter presents with a 2-cm laceration to the palm from the hooked end of a carpet knife. He is able to make a fist, and he has normal digital nerve sensation and normal capillary refill in all nail beds. When active flexion of the index and ring fingers is blocked, he is unable to flex the proximal interphalangeal joint of the long finger. Which of the following tendons has been lacerated?
 - (A) flexor pollicis longus
 - (B) flexor pollicis brevis
 - (C) flexor digitorum sublimis
 - (D) flexor digitorum profundus
 - (E) not a tendon injury
- **39.** Which of the following statements about variant angina is correct?
 - (A) Patients with variant angina have multiple risk factors for coronary artery disease (CAD).
 - (B) Variant angina shows no circadian variation.
 - (C) Coronary arteries typically are abnormal on cardiac catheterization in patients with variant angina.
 - (D) Variant angina does not occur during exercise.
 - (E) Substance abuse such as cocaine may be an important risk factor in variant angina.
- **40.** Which of the following drugs may produce a parkinsonian syndrome?
 - (A) haloperidol
 - (B) metoclopramide
 - (C) prochlorperazine
 - (D) amoxicillin
 - (E) erythromycin

- 41. Which of the following is an effect of PTH?
 - (A) decrease in calcium reabsorption in the renal distal tubule
 - (B) does not affect inhibition of phosphate reabsorption in the renal proximal tubule
 - (C) stimulation of 1α -hydroxylase in the kidney
 - (D) increase in serum iron
 - (E) excessive axillary hair growth
- **42.** A 40-year-old patient is being treated for acute bronchopneumonia and is doing well on antibiotics. The patient is seen by a medical student, who documents that the patient works in a ceramic factory. What further information should be ascertained?
 - (A) Perform a skin test for beryllium.
 - (B) Ask the patient if he ever worked in a coal mine.
 - (C) Ask if the factory is old and has the potential for asbestos.
 - (D) Reorder a chest x-ray to look for cavitation.
 - (E) See if the patient is on steroids.
- 43. Lyme disease is a tick-borne illness producing an inflammatory arthritis late in the illness. It is caused by which of the following organisms?
 - (A) Borrelia burgdorferi
 - (B) Vibrio parahaemolyticus
 - (C) Chlamydia trachomatis
 - (D) Pseudomonas aeruginosa
 - (E) Enterobiasis vermiculosis
- **44.** Which of the following causes increased aldosterone secretion?
 - (A) decreased blood volume
 - (B) administration of an angiotensinconverting enzyme (ACE) inhibitor
 - (C) hyperosmolarity
 - (D) hypokalemia
 - (E) stress

- 45. A 60-year-old woman presents with a 2-cm laceration to the mid-dorsum of the hand. She is able to fully extend all of her fingers; however, extension of the long finger is slightly weak. Exploration of the wound reveals the distal end of the cut extensor tendon to the long finger. How is she able to extend the long finger?
 - (A) extension through the interosseus muscles
 - (B) extension through the lumbrical muscles
 - (C) extension through an anomalous slip from the extensor carpi radialis tendon
 - (D) extension through a juncturae tendinum
 - (E) "mind over matter"
- 46. A patient presents to his family medical doctor with a prior diagnosis of multiple endocrine neoplasia type 1 (MEN 1) for a routine medical check. Which of the following laboratory studies would be expected to be abnormal?

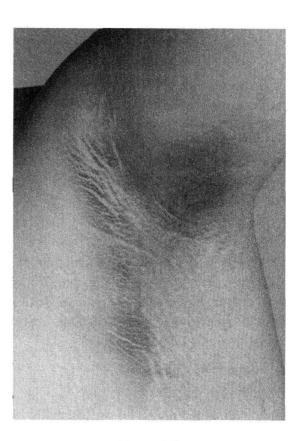


Figure 1.5
(Reproduced, with permission, from Wolff K, Johnson R, Suurmond D. Fitzpatrick's Color Atlas & Synopsis of Clinical Dermatology. New York: McGraw-Hill, 2005:87.)

- (A) serum TSH level
- (B) serum PTH level
- (C) serum calcitonin level
- (D) serum creatinine level
- (E) serum PSA
- **47.** In which of the following tissues are tumors likely to occur in MEN 1?
 - (A) ovary
 - (B) brain
 - (C) pancreas
 - (D) lung
 - (E) genital
- **48.** A 12-year-old girl has diffuse, velvety thickening with hyperpigmentation in the axillae and sides of the neck. What underlying condition should be considered?
 - (A) neurofibromatosis
 - (B) diabetes mellitus
 - (C) Peutz-Jeghers syndrome
 - (D) SLE
 - (E) hypothyroidism

- **49.** A 25-year-old obese woman presents with a rash involving her bilateral axillae (Figure 1.5). Which of the following laboratory tests would be most useful in establishing the cause?
 - (A) insulin
 - (B) hepatitis B serologies
 - (C) antinuclear antibody
 - (D) progesterone
 - (E) ferritin
- **50.** A 34-year-old woman presents with a generalized rash characterized by reddish-brown, slightly raised papules extending onto the palms. What is the most likely diagnosis?
 - (A) psoriasis
 - (B) herpes simplex
 - (C) syphilis
 - (D) pityriasis rosea
 - (E) folliculitis