Step 2 Clinical Knowledge (CK)

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INTRODUCTION

This booklet will help you prepare for the Step 2 Clinical Knowledge (Step 2 CK) component of the United States Medical Licensing Examination® (USMLE®).

Practice materials, which include Sample Test Items (PDF) and simulated web-based Tutorial and Practice Test Items, tutorials, as well as other informational materials are available at the USMLE website www.usmle.org. Examinees must also read the *USMLE Bulletin of Information* at www.usmle.org/bulletin.

IMPORTANT:
- The term *item* is used to describe a test question in any format.
- You **must** run the web-based Tutorial and Practice Test Items to become familiar with the test software **prior to your test date**.
- The tutorial provided at the beginning of the Step 2 CK Examination has fewer screens and less detailed information than the Step 2 CK web-based Tutorial and Practice Test Items on the USMLE website.
- The web-based Tutorial and Practice Test Items on USMLE website include single multiple-choice questions, a sequential set of multiple-choice questions, a scientific abstract (a summary of an experiment or clinical investigation, accompanied by two or more questions), and items with audio or video findings.

Please visit the USMLE website www.usmle.org often to view announcements, regarding changes in test delivery software, and to access updated practice materials. You must obtain the most recent information before taking any USMLE examination.

EXAMINATION FORMAT

Step 2 CK consists of multiple-choice questions (MCQs) prepared by examination committees composed of prominent faculty members, teachers, investigators, and clinicians who make up the USMLE Test Material Development Committees. All committee members have recognized expertise in their respective fields. They are selected to provide broad representation from the academic, practice, and licensing communities across the United States and Canada.

Step 2 CK is a one-day examination. It is divided into eight 60-minute blocks and administered in one 9-hour testing session. The number of questions per block on a given examination will vary but will not exceed 40. The total number of items on the overall examination will not exceed 318.

The examination also includes a minimum allotment of 45 minutes of break time and a 15-minute optional tutorial. The amount of time available for breaks may be increased by finishing a block of test items or the optional tutorial before the allotted time expires.

PURPOSE AND DESIGN OF THE EXAMINATION

Step 2 CK assesses an examinee's ability to apply medical knowledge, skills, and understanding of clinical science essential for the provision of patient care under supervision and includes emphasis on health promotion and disease prevention. Step 2 CK ensures that due attention is devoted to principles of clinical sciences and basic patient-centered skills that provide the foundation for the safe and competent practice of medicine under supervision.

Test questions focus on the principles of clinical science that are deemed important for the practice of medicine under supervision in postgraduate training.

The content description that follows is not intended as a curriculum development or study guide, but rather models the range of challenges that will be met in the actual practice of medicine. It provides a flexible structure for test construction that can readily accommodate new topics, emerging content domains, and shifts in emphasis. The categorizations and content coverage are subject to change. The best preparation for the examination is broad-based learning that establishes a strong general understanding of concepts and principles in the basic and clinical sciences.

Content Outline

All USMLE examinations are constructed from an integrated content outline. The outline is available on the USMLE website (www.usmle.org/pdfs/usmlecontentoutline.pdf). Content is organized according to general principles and individual organ systems. Test questions are classified into one of 18 major categories, depending on whether they focus on concepts and principles that are applicable across organ systems or within individual organ systems. Most organ systems are subdivided into normal and abnormal processes. They include subcategories of specific disease processes. In most instances, knowledge of normal processes is evaluated in the context of a disease process or specific pathology. Sections focusing on individual organ systems are subdivided according to normal and abnormal processes, including principles of therapy.

Not all topics listed in the content outline are included in every USMLE examination. Overall content coverage is comparable in the various examinations that will be administered to different examinees for each Step. The Step 2 CK examination covers content of specific disease processes or pathology. The Step 2 CK systems specifications are listed in Table 1.

Table 1: Step 2 CK System Specifications*

System	Range, %
General Principles of Foundational Science	1–3
Immune System	4–6
Blood & Lymphoreticular System	4–7
Behavioral Health	6–10
Nervous System & Special Senses	6–10
Musculoskeletal Sys/Skin & Subcutaneous Tissue	6–10
Cardiovascular System	8–12
Respiratory System	7–11
Gastrointestinal System	7–11
Renal & Urinary System & Male Reproductive	4–8
Pregnancy, Childbirth & the Puerperium	4–8
Female Reproductive System & Breast	4–8
Endocrine System	4–8
Multisystem Processes & Disorders	5–9
Biostatistics & Epidemiology/Population Health/Interpretation of Medical Literature	1–5

*Percentages are subject to change at any time. See the USMLE website (www.usmle.org) for the most up-to-date information.

Physician Tasks/Competencies

An additional organizing construct for Step 2 CK design is physician tasks and competencies. Each test item is constructed to focus on assessing one of the competencies listed in Table 2. Detailed information about the physician tasks and competencies outline is available at the USMLE website (www.usmle.org/pdfs/tcom.pdf).

Table 2: Step 2 CK Physician Task/Competencies Specifications*

Competency	Range, %
Medical Knowledge: Applying Foundational Science Concepts	12–16
Patient Care: Diagnosis • History/Physical Examination • Laboratory/Diagnostic Studies • Diagnosis • Prognosis/Outcome	40–50
Patient Care: Health Maintenance/Disease Prevention & Surveillance	7–11
Patient Care: Management • Pharmacotherapy • Clinical Interventions • Mixed Management	22–27
Communication/Professionalism Systems-based Practice & Patient Safety Practice-based Learning & Improvement	3–7

*Percentages are subject to change at any time. See the USMLE website (www.usmle.org) for the most up-to-date information.

Each Step 2 CK examination covers content related to the traditionally defined disciplines listed in Table 3.

Table 3: Step 2 CK Discipline Specifications*

Discipline	Range, %
Medicine	50–60
Surgery	25–30
Pediatrics	20–25
Obstetrics & Gynecology	10–20
Psychiatry	10–15

*Percentages are subject to change at any time. See the USMLE website (www.usmle.org) for the most up-to-date information.

Examples of Multiple Choice Questions (MCQs) focused on each of the competencies and samples of topics from different areas of the content outline are shown below.

Competency: Medical Knowledge/Scientific Concepts: Applying Foundational Science Concepts

Content Area: Cardiovascular System

A 55-year-old man has had crushing substernal chest pain on exertion over the past 6 weeks. He had a myocardial infarction 2 months ago. He takes nitroglycerin as needed and one aspirin daily. He has smoked two packs of cigarettes daily for 30 years. Examination shows normal heart sounds and no carotid or femoral bruits. Treatment with a β-adrenergic blocking agent is most likely to improve his symptoms due to which of the following mechanisms?

(A)   Decreasing myocardial contractility
(B)   Dilating the coronary arteries
(C)   Peripheral vasodilation
(D)   Preventing fibrin and platelet plugs

Answer: A

Competency: Patient Care: Diagnosis - Laboratory/Diagnostic Studies

Content Area: Behavioral Health

A 17-year-old girl comes to the physician for an examination prior to entering college. She reports that she feels well but is nervous about leaving home for the first time. She states that she has tried to diet to improve her appearance but that food restriction often "backfires" because she becomes hungry and then engages in episodes of binge eating. She reports a loss of control during these episodes, saying "It's like I stop thinking at all and before I know it, I have eaten two pizzas." She induces vomiting several times during each binge and has developed a pattern of binging and purging every evening. She has no history of serious illness and takes no medications. She is 165 cm (5 ft 5 in) tall and weighs 57 kg (125 lb); BMI is 21 kg/m^2. Vital signs are within normal limits. Physical examination shows dry mucous membranes, erosion of enamel on the lingual surface of the front teeth, and hypertrophy of the parotid gland. Serum studies are most likely to show which of the following sets of findings in this patient?

	Potassium	**Bicarbonate**
(A)	Decreased	decreased
(B)	Decreased	increased
(C)	Increased	decreased
(D)	Increased	increased
(E)	Normal	decreased
(F)	Normal	increased

Answer: B

Competency: Patient Care: Diagnosis

Content Area: Musculoskeletal Sys/Skin & Subcutaneous Tissue

A hospitalized 57-year-old man has had severe progressive pain in his left knee since awakening 2 hours ago. He was admitted to the hospital 2 days ago for an acute myocardial infarction. Cardiac catheterization showed occlusion of the left anterior descending artery, and he underwent placement of a stent. Current medications include aspirin, metoprolol, lisinopril, simvastatin, clopidogrel, and heparin. Vital signs are within normal limits. Examination of the knee shows a large effusion. The knee is hot to touch and erythematous. He holds the knee in 30 degrees of flexion; the pain is exacerbated with further flexion or extension. Laboratory studies show:

Hematocrit	40%
Leukocyte count	13,000/mm^3
Serum	
Ca^{2+}	9.2 mg/dL
Urea nitrogen	15 mg/dL
Creatinine	1.0 mg/dL
Albumin	3.6 g/dL

An x-ray of the left knee shows calcification of the synovium. Which of the following is the most likely diagnosis?

(A)   Deep venous thrombosis
(B)   Gonorrhea
(C)   Gout
(D)   Hemarthrosis
(E)   Pseudogout
(F)   Septic arthritis

Answer: E

Competency: Patient Care: Management - Clinical Interventions

Content Area: Female Reproductive & Breast

A previously healthy 27-year-old nulligravid woman comes to the emergency department because of a 2-day history of moderate-to-severe pain and swelling of the left labia. She is sexually active and uses condoms inconsistently. Her temperature is 37.2°C (99°F), pulse is 92/min, respirations are 18/min, and blood pressure is 115/75 mm Hg. Pelvic examination shows a 4 x 3-cm, tender, fluctuant mass medial to the left labium majus compromising the introital opening. Which of the following is the most appropriate next step in management?

(A) Administration of intravenous metronidazole
(B) Administration of intravenous penicillin G
(C) Ultrasound-guided needle aspiration of the mass
(D) Incision and drainage
(E) Vulvectomy

Answer: D

Competency: Practice-based Learning

Content Area: Biostatistics

A cohort study is conducted to compare the incidence of adverse effects of a recently approved antihypertensive pharmacotherapy with that of conventional therapy. A total of 20,000 patients are enrolled. Twelve thousand are prescribed the recently approved therapy, and 8,000 are prescribed conventional therapy. Patients in the study and control groups are matched for baseline blood pressure, age, and gender. Data are collected from the records of the patients' ongoing clinical care. Results show that those receiving the newly approved treatment have twice the incidence of fatigue compared with those receiving the conventional treatment. The results are statistically significant (p=0.01). Which of the following potential flaws is most likely to invalidate this study?

(A) Publication bias
(B) Selection bias
(C) Type I error
(D) Type II error

Answer: B

Competency: Professionalism

Content Area: Social Sciences

Three days after hospitalization for diabetic ketoacidosis, an 87-year-old woman refuses insulin injections. She says that her medical condition has declined so much that she no longer wishes to go on living; she is nearly blind and will likely require bilateral leg amputations. She reports that she has always been an active person and does not see how her life will be of value anymore. She has no family and most of her friends are sick or deceased. On mental status examination, she is alert and cooperative. She accurately describes her medical history and understands the consequences of refusing insulin. There is no evidence of depression. She dismisses any attempts by the physician to change her mind, saying that the physician is too young to understand her situation. She says, "I know I will die, and this is what I want." Which of the following is the most appropriate next step in management?

(A) Discharge the patient after she has signed an "against medical advice" form
(B) Seek a court order to appoint a legal guardian
(C) Offer insulin but allow the patient to refuse it
(D) Admit to the psychiatric unit
(E) Administer insulin against the patient's wishes

Answer: C