Multisystem Processes & Disorders

United States Medical Licensing Examination (USMLE) Step 1

4 to 8% of Step 2 CK · 9 sections · content outline and specifications

Multisystem Processes and Disorders covers problems that affect many organs at once. On Step 2 CK this means sepsis, fever of unknown origin, HIV, travel infections, poisoning, heat and cold injury, trauma resuscitation, autoimmune and paraneoplastic disease, nutrition, obesity, and fluids. Questions ask for the next step, the best test, the first drug or antidote, and the prognosis. Many items reward speed: the patient is unstable, and the answer is the action that saves the most time. Read the vital signs first and decide whether the patient is stable.

You should be able to: After this guide you should be able to recognize an unstable multisystem patient, choose the first action, the confirming test, and the specific antidote or drug, and name the main prevention steps.

Every section: the key point and the trap

1 Sepsis and septic shock

Sepsis is organ dysfunction caused by a poorly controlled response to infection; septic shock adds vasopressor need for a mean arterial pressure of 65 mm Hg and a lactate above 2 mmol/L after fluids.

Trap: Do not delay antibiotics for imaging, a lumbar puncture, or culture results. Cultures first only when they can be drawn at once.

2 Fever of unknown origin

Definition: temperature above 38.3°C on several occasions for at least 3 weeks with no cause after a basic evaluation.

Trap: Do not give empiric antibiotics or glucocorticoids to a stable patient without a diagnosis. They hide the cause. The one exception is suspected giant cell arteritis, where vision is at risk.

3 HIV and opportunistic infections

USPSTF: screen everyone aged 15 to 65 years for HIV at least once, and all pregnant patients; screen more often when risk continues.

Trap: Postexposure prophylaxis is for one recent exposure within 72 hours. A person with ongoing risk needs preexposure prophylaxis instead.

4 Travel and tropical infections

Ask every patient with fever where they traveled, when, what they did, and whether they took prevention medicine.

Trap: A negative first smear does not rule out malaria. Repeat the smears before you move on.

5 Poisoning and overdose

First steps for any poisoning: airway, breathing, circulation, glucose check, ECG, and acetaminophen and salicylate levels in every intentional ingestion.

Trap: Do not give flumazenil to an unknown overdose or physostigmine in a tricyclic overdose. Both can cause seizures or cardiac arrest.

6 Environmental injury: heat, cold, and more

Heat stroke: core temperature above 40°C with brain dysfunction; cool at once with cold-water immersion; antipyretics do not work.

Trap: Sweating does not rule out exertional heat stroke. Mental status, not skin dryness, separates heat stroke from heat exhaustion.

7 Trauma resuscitation

Primary survey in order: airway with cervical spine protection, breathing, circulation with bleeding control, disability, exposure.

Trap: Do not send an unstable patient to the CT scanner. Imaging is for patients stable enough to leave the resuscitation room.

8 Multisystem autoimmune disease and paraneoplastic syndromes

Systemic lupus erythematosus: rash, arthritis, serositis, cytopenias, and nephritis; ANA is sensitive, anti-dsDNA and anti-Smith are specific; low C3 and C4 suggest active disease.

Trap: Do not start furosemide before volume is restored. A loop diuretic in a dry patient worsens kidney function and calcium.

9 Nutrition, obesity, and fluids

Obesity is a body mass index of 30 or more; USPSTF advises intensive behavioral programs for adults with obesity and for children 6 years and older.

Trap: Normal electrolytes before feeding do not mean low risk. Total body stores can be empty while blood levels look normal.

Key terms

Septic shock: Sepsis with low blood pressure that needs vasopressors and a lactate above 2 mmol/L despite fluids.

Vasopressor: A drug that tightens blood vessels to raise blood pressure.

Antidote: A drug that reverses or blocks the effect of a specific poison.

Opportunistic infection: An infection that takes hold mainly when the immune system is weak, as in advanced HIV.

FAST: Focused assessment with sonography for trauma, a bedside ultrasound for free blood.

Paraneoplastic syndrome: Signs caused by substances a tumor makes or by the immune response to a tumor, not by the tumor mass itself.

Refeeding syndrome: Dangerous electrolyte shifts, mainly low phosphate, when a starved person is fed again too fast.

Carboxyhemoglobin: Hemoglobin bound to carbon monoxide; it cannot carry oxygen.

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