

A 63-year-old male presents to the urgent care center with a four hour history of abdominal pain which he describes as severe, diffuse and constant. He has had one episode of non-bloody vomiting since the pain started. His past medical history is significant for hyperlipidemia, type 2 diabetes, hypertension, chronic atrial fibrillation and chronic kidney disease. His current medications are lisinopril, digoxin, warfarin, metoprolol, simvastatin and insulin glargine. On physical examination, his blood pressure is 130/70 mmHg and his heart rate is 100/min and irregular. Physical examination reveals an overweight male in moderate distress. His abdomen is diffusely tender to palpation with positive rebound tenderness. His laboratory findings are as follows:

Hemoglobin	9.5 mg/dL
WBC count	7,500/mm ³
Platelets	90,000/mm ³
Sodium	137 mEq/L
Potassium	4.5 mEq/L
Chloride	101 mEq/L
Bicarbonate	22 mEq/L
Glucose	210 mg/dL
Creatinine	1.8 mg/dL
INR	2.1
Blood digoxin level	therapeutic

An upright abdominal x-ray shows free air under the diaphragm. Which of the following is the best initial treatment for this patient?

- ☐ A. Packed red blood cell transfusion
- ☐ B. Platelet transfusion
- ☐ C. Vitamin K
- ☐ D. Desmopressin
- ☐ E. Fresh frozen plasma

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An upright abdominal x-ray shows free air under the diaphragm. Which of the following is the best initial treatment for this patient?

- ☐ A. Packed red blood cell transfusion [15%]
- ☐ B. Platelet transfusion [10%]
- ☐ C. Vitamin K [13%]
- ☐ D. Desmopressin [7%]
- ☒ E. Fresh frozen plasma [55%]

Proceed to Next Item

[Proceed to Next Item](#)**Explanation:**

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This patient is presenting with an acute abdomen, as indicated by his rebound tenderness and subdiaphragmatic free (intraperitoneal) air on abdominal x-ray, suggesting perforation of a hollow abdominal viscus. As mortality from peritonitis increases rapidly the longer treatment is delayed, this patient requires emergent laparotomy. In addition to pre-operative nasogastric tube decompression, IV fluids and antibiotics, his warfarin-induced anticoagulation must be reversed. (While his INR of 2.1 is appropriate for chronic management of atrial fibrillation, if not corrected pre-operatively, it will predispose the patient to intraoperative and post-operative bleeding complications.) The most rapid means of normalizing the prothrombin time is restoration of the vitamin K-dependent clotting factors through an infusion of fresh frozen plasma (FFP).

(Choice A) The patient does have anemia, and the decision to transfuse patients pre-operatively is based on underlying risk factors for ischemic heart disease and anticipated blood loss during surgery. In general, tissue oxygen delivery does not become deficient until the hemoglobin drops below 7g/dL. Transfusion is often not required in patients with chronic anemia.

(Choice B) Platelet counts greater than 50,000/mm³ provide adequate hemostasis for most invasive procedures.

(Choice C) Vitamin K administration will correct the coagulation time in warfarin-treated patients if the drug is also stopped, but this mode of anticoagulation reversal is not appropriate for emergency situations as vitamin K's reversal effects depend on synthesis of new vitamin K-dependent clotting factors (II, VII, IX, and X) by the liver, which takes time.

(Choice D) Desmopressin (DDAVP) is given pre-operatively to patients with mild hemophilia A in order to prevent excessive bleeding. It indirectly increases factor VIII levels by causing vWF release from endothelial cells.

Educational objective:

Acute gastrointestinal perforation requires emergent laparotomy. If an affected patient is on warfarin, then reversal of anticoagulation must be rapidly achieved pre-operatively by infusion of fresh frozen plasma.