that are needed at this time. Given her intracerebral hemorrhage, she should have aggressive BP management
... option E is the right choice. Absolute Contraindication
Relative Contraindication
Acute intracranial hemorrhage
Rationale: This patient presents with a crescendo transient ischemic attack (TIA), defined as recurrent
... stroke or TIA attributed to stenosis of 70% to 99% diameter of a major intracranial artery. Poussa K, Lehto H,
5. Correct Answer: C
increase the risk of aneurysmal rupture include smoking, female sex, and posterior circulation, and patient
... population. Autonomic instability. Elevated serum creatine kinase levels can also be seen. Though the pathogenesis is not
... patient's possible endocarditis?
A. The patient should undergo urgent echocardiography to search for cardiac vegetations.
B. The patient should be administered broad-spectrum antibiotics to cover all potential sources of infection.
C. The patient should receive prophylactic anticoagulation with warfarin to prevent thromboembolic events.
D. The patient should be started on empiric antibiotics for possible infective endocarditis.
The patient in this scenario presents with a clinical picture of autoimmune encephalitis. The disease often appears following a febrile illness or vaccination. The Rationale:


We have a 70-year-old woman who presented with malaise and one episode of hematuria. She visited her primary care doctor and she is not taking any medications. Her physical examination is within normal limits. Her vital signs are normal. Her laboratory values are as follows:

- **Temperature:** 37.8°C
- **Blood pressure:** 97/64 mm Hg
- **Pulse rate:** 112 beats/min
- **Respiratory rate:** 20 breaths/min
- **Oxygen saturation:** 95% on room air

Her neurological, cardiovascular, and abdominal examinations were unremarkable. Her physical examination revealed the absence of any acute intracranial pathology. Urine toxicology screen was positive for cannabis. A lumbar puncture was performed, and results are pending. The patient was started on empirical broad-spectrum antibiotics. Physical examination revealed the absence of any acute intracranial pathology. Urine toxicology screen was positive for cannabis. A lumbar puncture was performed, and results are pending. The patient was started on empirical broad-spectrum antibiotics.

**Medical History:**
- Hypertension
- Diabetes mellitus
- Chronic kidney disease

**Family History:**
- History of myocardial infarction
- History of stroke

**Past Medical History:**
- History of hypertension
- History of diabetes mellitus

**Allergies:**
- Penicillin
- Aspirin

**Medications:**
- Metformin 1000 mg daily
- Lisinopril 10 mg daily
- Atorvastatin 20 mg daily

**Social History:**
- No smoking
- No alcohol
- No heavy drug use

**Physical Examination:**
- Normal cardiovascular system
- Normal respiratory system
- Normal abdominal system
-正常的 neurological system

**Laboratory Studies:**

<table>
<thead>
<tr>
<th>Test</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium</td>
<td>167 mEq/L</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.013</td>
</tr>
<tr>
<td>Random Urine Sodium</td>
<td>100 mEq/L</td>
</tr>
</tbody>
</table>

**Diagnosis:**
- Acute kidney injury
- Urinary tract infection

**Plan:**
- Start empirical antibiotics
- Repeat urine toxicology screen
- Order cultures of urine

---

**Section:**

**Osmotic Diuresis:**

- **Definition:**
  - Increased urine output due to absorption of concentrated solutes in the renal tubules
- **Mechanism:**
  - Osmotic diuresis is mediated by the renal mannitol transporter (SGLT2) in the collecting ducts
  - Mannitol, a non-ionic, freely filtered solute, is not reabsorbed in the renal tubules
  - Mannitol absorption leads to increased water excretion and decreased urine osmolality

**Syndrome of Inappropriate Antidiuretic Hormone (SIADH):**

- **Definition:**
  - Excessive production of antidiuretic hormone (ADH) in the absence of adequate plasma osmolality
- **Mechanism:**
  - ADH increases water reabsorption in the collecting ducts
  - Results in increased urine concentration and decreased urine output

**Rationale:**

- In a patient with salicylate toxicity, the presence of altered mental status is an indicator of toxicity.
- Salicylate toxicity can lead to increased urine output due to osmotic diuresis.
- SIADH is a common cause of increased urine output in patients with salicylate toxicity.

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**Clinical Practice Guidelines:**

- **Management of Ascites, Spontaneous Bacterial Peritonitis, and the Hepatorenal Syndrome in Cirrhosis:**
  - doi:10.1016/j.jhep.2010.05.004.

---

**Question:**

Which is the MOST likely cause of this increased urine output?

**Options:**
A. Syndrome of inappropriate antidiuretic hormone
B. Osmotic diuresis
C. Urinary tract infection
D. Acute kidney injury
E. Renal tubular acidosis

**Answer:**

**C. Urinary tract infection**

- Urinary tract infections can lead to increased urine output due to osmotic diuresis.
- Increased urine output due to osmotic diuresis is a common complication of urinary tract infections.

---

**References:**

- Rivaroxaban Apixaban when INR 1.5 cm 8.
- An 85-year-old woman underwent a transapical transcatheter aortic valve replacement. She developed acute kidney injury with oliguria and hyperkalemia.

---

**Further Reading:**

- Physical examination revealed the absence of any acute intracranial pathology. Urine toxicology screen was positive for cannabis. A lumbar puncture was performed, and results are pending. The patient was started on empirical broad-spectrum antibiotics.

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**References:**

- Rivaroxaban Apixaban when INR 1.5 cm 8.
- An 85-year-old woman underwent a transapical transcatheter aortic valve replacement. She developed acute kidney injury with oliguria and hyperkalemia.
infection is suspected. What is the NEXT BEST step regarding this ART during this admission? A. Hold... medications E. Optimize ART by changing the ART regimen to include two new medications


Correct Answer: B Rationale: HSV is caused by decreased T-cell immunity and may result from increased age, primary infection during the time of intensity on T2 and fluid-attenuated inversion recovery (FLAIR) images. Suspected HSV is treated with empiric antiviral treatment. Patients who are seropositive for HSV prior to transplant are often on HSV prophylaxis with Valacyclovir.

AIDS-defining illness (cryptococcal meningitis), a CD4 count above 200 cells/µL makes him less susceptible to MAC. Treatment with TMP-SMX alone would leave gaps in gram-negative coverage, and the initial treatment should be a combination of antibiotics.

Compensation via Winter's formula as follows:

\[
\text{Expected PaCO}_2 = 21 + 0.8 \times (23 - \text{HCO}_3^-) = 21 + 0.8 \times (23 - 32) = 21 - 8.0 = 13 \, \text{mmHg}
\]

The higher HCO_3^- in the patient suggests chronic respiratory alkalosis. Therefore, the patient has acute on chronic respiratory acidosis. Reference Rose B, Post T. Clinical Physiology of Acid-Base Disorders. 3rd ed. New York: Lippincott Williams & Wilkins; 2005.

The patient is experiencing symptoms of "contraction alkalosis." As a compensatory mechanism, the elevated pH will depress the respiratory centers, thus impairing carbon dioxide removal. In this case, the patient has aspirin overdose which explains the tinnitus and metabolic alkalosis.

References


Parenteral nutrition with acetate may reduce the incidence of metabolic alkalosis. In situations where high urine pH and low plasma bicarbonate levels are associated with incomplete depletion of hepatic glycogen stores, the use of acetate may be beneficial. On the other hand, hyperchloremic alkalosis is caused by dehydration or hypokalemia, which are common causes of metabolic alkalosis in critically ill patients. Reference Liberman J, Varghese L, Kamel T, Batsis J. A review of metabolic alkalosis. Crit Care Med. 2014;42(2):506-517.

The patient shows a pH 7.28, pCO2 18 mm Hg, and plasma osmolality 278 mOsm/kg. Which of the following is the MOST likely cause of this patient's metabolic abnormality? A. Respiratory acidosis with increased alveolar ventilation B. Respiratory acidosis with decreased alveolar ventilation C. Metabolic acidosis with increased renal excretion of bicarbonate D. Metabolic alkalosis with decreased renal excretion of bicarbonate

How much bicarbonate deficit is present in renal tubular acidosis (RTA) type I? A. 10 mEq/L B. 20 mEq/L C. 30 mEq/L D. 40 mEq/L

To correct this, the anion gap must be calculated: $\text{anion gap} = \text{Na}^- + \text{UK}^- - \text{Cl}^-$. The calculation yields an anion gap of 12 mEq/L, indicating the presence of anion gap metabolic acidosis.
Which of the following statements regarding acute traumaticemothoracesand pneumothoraces is true? A. All traumaticemothoraces will resolve on their own and will not require medical intervention. B. Pneumothoraces can only be caused by a physical injury such as a stab or gunshot wound. C. Persistent air leakage and/or recurrent episodes of pneumothorax are indications for chest tube placement. D. A patient with a tension pneumothorax will have decreased breath sounds and hyperresonance on percussion on the affected side. 

Vital signs are as follows: Temp 99°F, HR 100 bpm, BP 130/70 mm Hg, RR 19, Sat 95% on room air. On chest x-ray, there is a rib fracture and a small pneumothorax. The patient is started on oxygen and is observed. Which of the following statements is true? A. Oxygen supplementation is the only treatment needed for a small pneumothorax. B. If the pneumothorax increases in size or causes respiratory distress, a chest tube may be necessary. C. Rib fractures and pneumothoraces are always caused by traumatic injuries. D. A chest tube is typically placed in the right 4th intercostal space for drainage of a traumaticemothorax.

In the management of sepsis, which of the following is the most appropriate course of action? A. Aggressive fluid resuscitation with escalated volume lactate goal-directed therapy B. After acquiring appropriate culture data, initiation of broad-spectrum antimicrobial therapy C. Obtain screening studies for rheumatologic disorders D. Review results of CBCs/differential counts from prior hospitalizations.
37.4°C, and ECG shows sinus bradycardia. Her chemistries reveal a creatinine that has worsened from baseline, ...ive use, no treatment required B. Urgent hemodialysis C. Calcium chloride D. Potassium chloride

Chapter 106

and she was taking no other medications at home. Which of the following is the most appropriate next step?

7. A 24-year-old man with no past medical history was scheduled for elective inguinal hernia repair under general anesthesia. After arrival in the operating room, he was found to have a large amount of ascites. Which of the following is the most appropriate next step?

Laboratory tests reveal: Hemoglobin 8.0 g/dL, platelet count 57/mm³, and creatinine of 2.8 mg/dL. Of note, the patient has a history of abdominal sepsis and has been treated with broad-spectrum antibiotics. What is the most appropriate next step?

CMV disease can lead to allograft loss and mortality. Kidney transplant patients commonly receive CMV prophylaxis. Oral ganciclovir is not available in the United States. Patients with life-threatening CMV disease, high risk of CMV disease, or a history of CMV disease are treated with intravenous ganciclovir.


The donor organ was retrieved from a 20-year-old brain-dead man. Prior to orthotopic cardiac transplantation, the donor organ was retrieved from a 20-year-old brain-dead man. Prior to orthotopic cardiac transplantation,

September 18, 2018.


Ensuring voluntariness of consent

You are the director of an ICU in an academic center. Your role is to ensure that patients are adequately informed about their treatment options and that their consent is voluntary. To achieve this, you have set up a committee that includes ethicists, nurses, and doctors to review all consent forms. The committee has found that patients are often not adequately informed about the risks and benefits of their treatment, leading to a low level of understanding and consent.

Decisionmaking

In the scenario provided, you are faced with the decision of whether to administer a new drug that has not yet been approved by the regulatory body. The drug has shown promising results in preliminary studies, but there is still uncertainty about its long-term effects. You must weigh the potential benefits against the risks and decide whether to proceed with the treatment.

From the table below, you can see that the drug has a success rate of 70% in preliminary trials, but the risk of severe side effects is also high. The committee has recommended against administering the drug, citing the lack of sufficient data and the potential for serious harm to the patients.

In conclusion, you must make a decision that balances the potential benefits against the risks. Consider consulting with ethicists and other experts to ensure that you make an informed decision that respects the patient's autonomy and well-being.

References:

The available evidence suggests that the impact of ICU-based palliative care includes all the following except:

A. The potential to enhance patients' quality of life by addressing end-of-life concerns.
B. Reducing patients' suffering by providing pain and symptom management.
C. Facilitating smoother transitions for patients transitioning to other settings or home care.
D. Increasing hospital costs due to prolonged hospital stays.

2. Several residents approach you, an intensivist, to mentor them through a teaching task that is not perceived by the person to be beneficial. Depersonalization is feeling disconnected from one's work and patients. Which of the following tasks is most likely to contribute to depersonalization?

A. Managing patients with chronic lung disease.
B. Treating patients with acute kidney injury.
C. Performing invasive procedures on patients.
D. Providing comfort care to patients nearing the end of life.


Increasing patient safety and reducing preventable patient injuries in the ICU: the role of the attending physician (Task 14-31).


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5. A Rationale:

Critical care resources are often vital, limited, and expensive. When this is compounded by a critically ill patient's need for prolonged mechanical ventilation, such as we often see in patients with chronic lung disease, it becomes crucial to understand the potential benefits and harms of different treatment strategies. The patient's safety and well-being must be prioritized in decision-making.

6. The Richmond Agitation–Sedation Scale is often used to assess and manage agitation in ICU patients. If a patient has a score greater than −3, which of the following actions is appropriate?

A. Providing extra sedation to calm the patient.
B. Increasing the level of respiratory support to prevent agitation.
C. Discontinuing any unnecessary interventions that could trigger agitation.
D. Administering an anti-anxiety medication.

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admitted to the ICU after a motor vehicle crash and associated polytrauma. Major injuries include multiple head injuries, cervical spine fracture, and limb fractures. The patient was intubated and mechanically ventilated upon arrival. Immediate resuscitation efforts included fluid resuscitation, blood products, and antibiotics for possible sepsis. The patient was transferred to the ICU for further management and monitoring.

On admission to the ICU, the patient's vital signs were: blood pressure 90/60 mm Hg, heart rate 120 bpm, respiratory rate 24 breaths/min, and oxygen saturation 90% on high-flow nasal cannula. ABG values showed pH 7.36, bicarbonate 22 mEq/L, and PaCO2 38 mm Hg. The patient was drowsy and responsive to pain but required sedation for comfort.

Over the next 24 hours, the patient's condition worsened with new onset of hypotension, tachycardia, and altered mental status. A repeat CT scan revealed new areas of hemorrhage in the head and chest. The patient developed oliguria and required renal replacement therapy. An echocardiogram showed normal left ventricular function but significant tricuspid regurgitation.

The patient was started on a regimen of broad-spectrum antibiotics and prophylactic anticoagulation. A tracheostomy was performed to facilitate ventilation. The patient was managed with high-dependency care, including invasive hemodynamic monitoring and on-going neurological assessments.

On day 3, the patient developed increased tan-colored respiratory secretions, and his status deteriorated. A bronchoscopy with bronchoalveolar lavage was performed. Pathology revealed evidence of aspiration pneumonia. The patient's condition further declined, and an emergent noncontrast head CT scan showed extensive intracranial hemorrhage.

The patient was pronounced deceased on day 5.

**Question:** What was the primary cause of death in this patient?

**Options:**
A. Traumatic brain injury
B. Septic shock
C. Aspiration pneumonia
D. Acute hemorrhagic stroke
E. Respiratory failure

---

*Note: The answer is not provided in the document.*

---

**Answer:**
E. Respiratory failure

---

*Explanation:* The primary cause of death in this patient appears to be respiratory failure, likely due to progressive pneumonia and multi-organ failure. The patient's condition had been declining over several days, with deterioration in multiple organ systems and respiratory failure being the final outcome.
Pericardial effusion. However, the image is in diastole (since aortic valve is closed), but WITHOUT right atrial pressure (CVP) in this particular patient. This study is ruling out the CVP complex. In severe cases, this may lead to a superior vena cava on echocardiography, possible evidence of hemodynamic instability with decreased cardiac output.

Acute coronary syndrome is associated with nosocomial infections and hospital-associated outbreaks and should prompt evaluation for a potential infection. Ceftazidime, imipenem, cefepime, piperacillin-tazobactam, amoxicillin-clavulanate, narrow-spectrum cephalosporins, cephamycins, cefuroxime, macrolides, tetracyclines, and fluoroquinolones may be considered for empiric antibiotic therapy. However, the potential for inducible resistance is high during treatment with fluoroquinolones.

Acute respiratory distress syndrome (ARDS) is associated with nosocomial infections and hospital-associated outbreaks and should prompt evaluation for a potential infection. Ceftazidime, imipenem, cefepime, piperacillin-tazobactam, amoxicillin-clavulanate, narrow-spectrum cephalosporins, cephamycins, cefuroxime, macrolides, tetracyclines, and fluoroquinolones may be considered for empiric antibiotic therapy. However, the potential for inducible resistance is high during treatment with fluoroquinolones.

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