1. Read chapter

2. Review objectives (p.138)

3. Review key terms and definitions (p.138)

4. What are the indications for xanthines? (p.139-140)

5. Are xanthines the first-line treatment of choice for asthma? Explain.

6. Apnea of prematurity is cessation of breathing in premature infants. These infants typically have underdeveloped lungs and other adverse medical conditions. The period of apnea can vary from occasional (observation and stimulation) to very severe (intubation and mechanical ventilation).

In addition to xanthines, what is the other treatment option for apnea of prematurity?

7. Main characteristics of caffeine citrate and theophylline:

<table>
<thead>
<tr>
<th></th>
<th>Caffeine</th>
<th>Theophylline</th>
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<tbody>
<tr>
<td><strong>Half-life</strong></td>
<td>37 to 231 hours</td>
<td>12 to 64 hours</td>
</tr>
<tr>
<td><strong>Therapeutic level (serum)</strong></td>
<td>8 to 20 µg/ml</td>
<td>6 to 12 µg/ml</td>
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<td></td>
<td></td>
<td>5 to 15 µg/ml (asthma)</td>
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<td></td>
<td></td>
<td>5 to 10 µg/ml (COPD)</td>
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<tr>
<td><strong>Toxic level (serum)</strong></td>
<td>&gt;30 µg/ml</td>
<td>&gt;20 µg/ml</td>
</tr>
</tbody>
</table>

The therapeutic level of caffeine and theophylline is titrated based on *positive* patient response (significant reduction or elimination of apnea) and *negative* signs and symptoms of theophylline toxicity (nervousness, tachycardia, tremor). See also Box 8-1, p.140.

Since theophylline is a weak bronchodilator, it may be used to treat infants with apnea of prematurity *and* bronchospasm.

8. Are the theophylline therapeutic and toxic levels of 6 to 12 µg/ml and >20 µg/ml, respectively, appropriate and suitable for all infants? Explain.
9. Theophylline may be administered via _______ routes. (Table 8-1)

10. Aminophylline may be administered via _______ routes.

11. Why are xanthines not used as the first-line drug to relieve bronchospasm in patients with asthma and COPD?

12. What are the proposed theories of activity for xanthines? (p.140)

13. Review p.143-144 and Box 8-2 for the factors that can increase or decrease theophylline levels in blood.

14. Describe the clinical uses of theophylline for asthma and COPD. (p.144-145)

15. List the nonbronchodilating effects of theophylline.

16. Why is caffeine a preferred drug for apnea of prematurity? (p.145)

17. Review and complete “Clinical Scenario.” (p.146-147)

Based on the clinical scenario, discuss the clinical significance of: (A) smoking history, (B) thick, greenish sputum, (C) use of beta agonist inhaler at least four times daily, (D) very SOB, (E) use of accessory muscles to breath, (F) expiratory wheezes and poor air movement, (G) blood pressure 170/112 mm Hg, (H) WBC 15,000 /cc, (I) chest radiograph show hyperinflation and flattened diaphragms.