Quiz: *In Vivo* Non-Imaging Studies

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1. Which one of the following is NOT an example of an *in vivo* non-imaging procedure?
   a. a radioimmunoassay
   b. a splenic sequestration study
   c. a Schilling Test
   d. a Thyroid Uptake Test

2. The typical injected dose of Cr-51 RBCs is
   a. 0.0075 mCi
   b. 0.075 mCi
   c. 0.75 mCi
   d. 7.5 mCi

3. The normal value for half-time of survival of Cr-51 RBCs is
   a. approximately 30 days
   b. approximately 60 days
   c. approximately 90 days
   d. approximately 120 days

4. A splenic sequestration study was performed. A Spleen/Liver Ratio of 2.8:1 was obtained. The diagnosis would be
   a. Normal study
   b. Very small spleen
   c. Slightly enlarged spleen
   d. Significant splenic sequestration

5. A Plasma volume/Red Cell Mass Study is useful
   a. to measure hematocrit
   b. to diagnose Polycythemia Vera
   c. to evaluate renal function
   d. to diagnose pernicious anemia

6. A Plasma Volume Study is based on the principle of
   a. reverse transition
   b. isotope dilution
   c. reverse isotope dilution
   d. plasma dilution
7. The results of a RCM/PV study are shown at right. The diagnosis is:

   a. Normal study
   b. Dehydration
   c. Polycythemia Vera
   d. Pernicious anemia

<table>
<thead>
<tr>
<th></th>
<th>Expected Value</th>
<th>Measured Value</th>
<th>% Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plasma Volume</td>
<td>3300</td>
<td>3400</td>
<td>+3.0</td>
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<tr>
<td>Red Cell Volume</td>
<td>2200</td>
<td>2650</td>
<td>+20.5</td>
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<tr>
<td>Total Blood Volume</td>
<td>5500</td>
<td>6050</td>
<td>+10.0</td>
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8. The administered activity of radiocobalt in a Schilling Test is approximately

   a. 0.5 $\mu$Ci
   b. 5 $\mu$Ci
   c. 50 $\mu$Ci
   d. 500 $\mu$Ci

9. The Schilling Test is used to diagnose

   10. Pernicious anemia
   11. Hyperthyroidism
   12. Polycythemia
   13. Plummer’s Disease

14. In the Schilling Test, an IM injection of 1 mg of non-radioactive B$_{12}$ is given to

   a. Reduce radiation dose to the liver
   b. Increase urinary output
   c. Saturate binding sites in the liver
   d. Increase binding of radiocobalt B$_{12}$ to intrinsic factor

15. Patient X has a deficiency of intrinsic factor in his gut. The expected result of Stage 1 of a Schilling Test would be a % excretion of the radiocobalt in the range of

   a. 0-6%
   b. 6-10%
   c. 10-30%
   d. 80-90%

16. The result of a dual Schilling Test was 14.1% excretion of Co-57 and 13.9% excretion of Co-58. The diagnosis is

   a. pernicious anemia
   b. simple malabsorption syndrome unrelated to intrinsic factor deficiency
   c. normal study
   d. impossible to make without first administering an antibiotic and then repeating the study 2 weeks later
17. The typical administered dose of I-123 NaI for performing an RAIU is
   a. 0.2 μCi  
   b. 2 μCi  
   c. 20 μCi  
   d. 200 μCi

18. The typical administered dose of I-131 NaI for performing an uptake and scan in a patient with a substernal thyroid is
   a. 0.1 μCi  
   b. 1 μCi  
   c. 10 μCi  
   d. 100 μCi

19. Which of the following is NOT a required part of the preparation for an RAIU?
   20. Discontinue synthroid for 4 weeks prior to performing RAIU  
   21. Patient must be NPO from midnight until 1 hour post administration of I-123 NaI  
   22. Patient must discontinue propranolol for 4 weeks prior to performing RAIU  
   23. Patient must not have undergone CT Scan with Contrast Media

24. A patient underwent an RAIU and the result was 58.4%. The diagnosis is
   a. Normal  
   b. Hypothyroid  
   c. Hyperthyroid  
   d. Hashimoto’s thyroiditis