UNDERSTANDING SEMEN ANALYSIS  
(WHO CRITERIA)

Macroscopic semen characteristics (Table 1)

<table>
<thead>
<tr>
<th>Source</th>
<th>Volume</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urethral and bulbourethral glands</td>
<td>0.1-0.2cc</td>
<td>Viscous, clear</td>
</tr>
<tr>
<td>Testes, epididymides, vasa deferentia</td>
<td>0.1-0.2cc</td>
<td>Sperm present</td>
</tr>
<tr>
<td>Prostate</td>
<td>0.5-1.0cc</td>
<td>Acidic, watery</td>
</tr>
<tr>
<td>Seminal vesicles</td>
<td>1.0-3.0cc</td>
<td>Gelatinous, fructose positive</td>
</tr>
<tr>
<td>Complete ejaculate</td>
<td>2.0-5.0cc</td>
<td>Liquefies in 20-25min</td>
</tr>
</tbody>
</table>

Commonly used normal semen parameters (WHO) (Table 2)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume</td>
<td>&gt;2.0 ml</td>
</tr>
<tr>
<td>pH</td>
<td>7.2-7.8</td>
</tr>
<tr>
<td>Concentration</td>
<td>&gt;20x10^6/ml</td>
</tr>
<tr>
<td>Motility</td>
<td>&gt;50%</td>
</tr>
<tr>
<td>Morphology</td>
<td>&gt;30% with normal morphology</td>
</tr>
<tr>
<td>WBC</td>
<td>&lt; 1x10^6/ml</td>
</tr>
</tbody>
</table>

Gradation of sperm motility (WHO) (Table 3)

<table>
<thead>
<tr>
<th>Type of motility</th>
<th>Score</th>
<th>Classes of spermatozoa motility</th>
<th>Normal value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No movement</td>
<td>0</td>
<td>Rapid progressive Class A</td>
<td>&gt;25%</td>
</tr>
<tr>
<td>Movement, none forward</td>
<td>1</td>
<td>Progressive Class B</td>
<td>&gt;25%</td>
</tr>
<tr>
<td>Occasional movement of a few sperm</td>
<td>1+</td>
<td>Class A+B</td>
<td>&gt;50%</td>
</tr>
<tr>
<td>Slow, undirected</td>
<td>2</td>
<td>Non progressive Class C</td>
<td>&lt;50%</td>
</tr>
<tr>
<td>Slow, directly forward movement</td>
<td>2+</td>
<td>Immotile or static Class D</td>
<td>&lt;50%</td>
</tr>
<tr>
<td>Fast, but undirected movement</td>
<td>3-</td>
<td>Class C+D</td>
<td>&lt;50%</td>
</tr>
<tr>
<td>Fast, directed forward movement</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very fast forward movement</td>
<td>3+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extremely fast forward movement</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Nomenclature for semen variables (WHO) (Table 4)

<table>
<thead>
<tr>
<th>Semen variables</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normozoospermia</td>
<td>Normal ejaculate as defined in tables 1, 2 and 3.</td>
</tr>
<tr>
<td>Oligozoospermia</td>
<td>Sperm concentration fewer than 20x10^6/ml</td>
</tr>
<tr>
<td>Asthenozoospermia</td>
<td>Fewer than 50% spermatozoa with forward progression (categories A and B) or fewer than 25% spermatozoa with category A movement</td>
</tr>
<tr>
<td>Teratozoospermia</td>
<td>Fewer than 30% spermatozoa with normal morphology</td>
</tr>
<tr>
<td>Oligoasthenoteratozoospermia</td>
<td>Signifies disturbance of all three variables (combination of only two prefixes can be used)</td>
</tr>
<tr>
<td>Azoospermia</td>
<td>No spermatozoa in the ejaculate</td>
</tr>
<tr>
<td>Aspermia</td>
<td>No ejaculate</td>
</tr>
</tbody>
</table>