Computer Assisted Semen Analysis

Spermolyzer Sperm Analyzer Number 1 in Egypt
Computer Assisted Semen Analysis System utilizes modern computer and advanced image processing techniques for clinical test of sperm motility, quality and morphology. Based on the sperm test standards of the WHO 5th criteria, the system can analyze the characteristic of sperm motions comprehensively through image processing of sperms in their dynamic or morphological status. The system then analyzes these values and generates accurate parameters to reflect sperms' quality. The whole procedure is fast and provides several important information that are vital to present scientific basis for the male reproductive ability.
Standard Methods:

- Spermolyzer includes two standard methods (Dynamic and Morphology).
- The analysis of the parameters is performed according to the recommendations given by the World Health Organization (WHO) for the latest 5th edition for motility patterns & Morphometric assessment of human semen.

1- Dynamic standard method:
- The method is designed to estimate the spermatozoa concentration and their motility in a native specimen.
- Determining spermatozoa concentration in (million/ml)
- Measuring spermatozoa movement parameters and classify this movement to classes in accordance of WHO recommendations.
- Measuring spermatozoa dynamic parameters (VCL/VSL/VAP/MAD/ALH/BCF/LIN/WOB/STR).

2- Morphology standard method:
- The method is designed to determine the morphological parameters of Spermatozoa.
- The software calculates the (TZI/SDI/MAI) according to the latest criteria of the World Health Organization.

Creative Constant-Temperature Operation Desk
The operation desk makes provides a constant temperature of 37 during sperm testing during the whole test procedure. This in turn eliminates the influence of excessive low outside temperature on the tested sperm such as sperm velocity, sperm vitality etc.

Unique Virtual Grid Function
This function has realized the direct comparison of test results between human being and machine in the system. If you wish to use manual counting, there is no need to buy an expensive calibrated counting chamber, it is all in your screen with the aid of virtual grid function.

Database:
- The in-built database enable the user to store, backup and restore any kind of obtained information.
- The in-built database enable the user to generate historical report for any Patient.
- The in-built database is capable of helping researcher by generating many Statistics reports.

Other Features of Spermolyzer software:
- Spermolyzer software is able to automatically add appropriate comments according to the patient results.
- Spermolyzer software has the ability to generate custom reports like Urine, Stool, CBC and Bone marrow with any captured image using the system digital camera and microscope.
- Spermolyzer software allows the user to record and print the manual test result of semen.
Computer Assisted Semen Analysis (Mira-9000 CASA)


**Physical properties:**

- **Volume:** 2.6 ml ≥ 1.5 ml
- **pH:** 7.3 ≥ 7.2
- **Color:** Grey Opalescent
- **Viscosity:** Normal
- **Liquefaction time:** 45 min.
- **Liquefaction state:** Complete

**Test result:**

- **Concentration (million/ml):** 115.70 PASSED ≥ 55 (million/ml)
- **Total sperm no. (million):** 300.82 PASSED ≥ 90 (million/ ejaculate)
- **Progressive motility (PR):** 61.60 PASSED ≥ 32 %
- **Total Motility (PR+NP):** 74.60 PASSED ≥ 40%
- **Morphology Index:** 20.00 PASSED ≥ 4 % normal is accepted
- **Viability:** 85 % PASSED ≥ 58 %

**Agglutination & Aggregation:**

- Agglutination: Nil
- Non-specific Aggregation: Nil

**Cells other than sperms:**

- White Blood Cells: 0 - 1 < 5 x 10^6/ml
- Red Blood Cells: 0 - 1 < 5 x 10^6/ml
- Spermatozoic cells: 2 - 5 x 10^6/ml
- Epithelial cells: 0 - 1 x 10^6/ml

**Comment:**

The semen passed the W.H.O. strict criteria for count, motility and morphology.

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**Dynamic Analysis Report (CASAS - WHO 2010):**

**Classification**

<table>
<thead>
<tr>
<th>Classification</th>
<th>Conc. (million/ml)</th>
<th>Total number (million)</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tested sperm</td>
<td>115.70</td>
<td>300.8</td>
<td>100</td>
</tr>
<tr>
<td>Total motility (PR+NP)</td>
<td>74.60</td>
<td>235.2</td>
<td>79.89</td>
</tr>
<tr>
<td>Progressive motility (PR)</td>
<td>61.60</td>
<td>183.6</td>
<td>61.00</td>
</tr>
<tr>
<td>Non progressive (NP)</td>
<td>15.00</td>
<td>41.6</td>
<td>13.80</td>
</tr>
<tr>
<td>Immobile (IM)</td>
<td>20.20</td>
<td>75.9</td>
<td>25.20</td>
</tr>
</tbody>
</table>

* Progressive motility (PR): spermatozoa moving activity, either linearly or in a large circle, regardless of speed.
* Non progressive motility (NP): all other patterns of motility with an absence of progression, i.e. swimming in small circles, the flagellar force hardly displacing the head, or when only a flagellar beat is observed.
* Immobile (IM): no movement.

**Dynamic Parameters Report (II):**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>VCL [μm/s]</td>
<td>46.15</td>
</tr>
<tr>
<td>MAD [°]</td>
<td>45.83</td>
</tr>
<tr>
<td>LIN</td>
<td>62.50 %</td>
</tr>
<tr>
<td>VSL [μm/s]</td>
<td>29.07</td>
</tr>
<tr>
<td>ALH [μm]</td>
<td>4.54</td>
</tr>
<tr>
<td>WOB</td>
<td>71.97 %</td>
</tr>
<tr>
<td>VAP [μm/s]</td>
<td>33.19</td>
</tr>
<tr>
<td>BCF [Hz]</td>
<td>4.70</td>
</tr>
<tr>
<td>STR</td>
<td>65.42 %</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>VCL: Curvilinear velocity</td>
<td>MAD: Mean Angular Degree</td>
</tr>
<tr>
<td>VSL: Straight line velocity</td>
<td>LIN: Linearity (VSL/VCL)</td>
</tr>
<tr>
<td>ALH: Amplitude of lateral head Displ.</td>
<td>BCF: Beat-cruise Frequency</td>
</tr>
<tr>
<td>VAP: Average path Velocity</td>
<td>STR: Straightness (VSL/VAP)</td>
</tr>
</tbody>
</table>
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