*For Research Use only within United States.*

# HT CASA Clinical Sperm Motility Software
## For IVOS Clinical and CEROS Clinical Systems

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**Data Input**

| | |
|---|---|
| Analysis Info: | Patient ID |
| | Patient Name |
| | Ejaculate Volume (manually or by scale) |
| | Sample:Diluent |
| Notes: | User-defined |
| Data Fields: | 25 User-Defined Labels/Fields |

**Analysis Results**

| | |
|---|---|
| Counts: | Total, Motile, Static, Progressive, Slow |
| Percentages: | Total, Motile, Static, Progressive, Slow (%) |
| Concentrations: | Total, Motile, Static, Progressive, Slow (M/ml or B/ml) |
| Sample: | Total, Motile, Static, Progressive, Slow (M or B) |
| Kinematic Values: | VAP, VCL, VSL, ALH, BCF, LIN, STR, DAP, DCL, DSL, *WOB, Elongation (head shape) and Area (head size). Includes mean, standard deviations and median. |
| Pie Charts*: | WHO 4/5/*6 Percent of Total (motile vs. static) |
| | WHO 4/5/*6 Velocity Percent of Motile |
| WHO Standards: | WHO 4 |
| | Reference Limits: Concentration, Motility, Progressive |
| | Velocity Distribution by WHO 4 A, B, C, D categories |
| | WHO 5 ($5^{th}$ centile, 95% CI, Cooper et al. 2010) |
| | Reference Limits: Concentration, Motility, Progressive |
| | Velocity Distribution by WHO 5 Progressive, Non-progressive, and Immotile categories |
| | WHO 6* (5th centile, 95% CI, Cooper et al. 2021) |
| | Reference Limits: Concentration, Motility, Progressive |
| | Velocity Distribution by WHO 6 A, B, C, D categories |
| Replicate Analysis*: | Automatic two sample analysis comparison |
| | Based on WHO 4/ 5/*6 results |
| | Override and lock of selected WHO variable |
| | Display of Mean, Delta Gate, Reference Limits Result |

**Live Setup Configuration**

| | |
|---|---|
| Illumination: | Interactive illumination setting |
| | Histogram showing real-time feedback* |
| Motility Setup: | Interactive sperm identification setup |
| | Automatic minimum tail brightness based on Photometer Offset* |
| | Minimum head and *tail brightness |
| | Minimum and maximum head size and head elongation |
| | Real-time feedback through color overlays* |

**Quality Control**

| | |
|---|---|
| Auto Illumination*†: | One Shot and Auto on Field Change |
| Illumination Check: | Quick view to confirm illumination and focus |
| Illumination Status: | Acceptable / Unacceptable |
| Video Playback: | Color-coded labeling of motile, progressive and static cells |
| Static Tail Filter*: | Automatic elimination of debris |

**Video Playback**

| | |
|---|---|
| Full Field: | Frame-by-frame playback |
| | Analysis results for selected field |
| | Turn on/off motility and morphology overlays |
| | Save TIFF image of individual frames |
| | Export fields as .mp4 files for presentation purposes only* |
| Zoom Cell: | Frame-by-frame playback |
| | Analysis results for selected sperm |
| | Data point coordinates |
| | Cell classifications |
| | Turn on/off motility overlay* |
| | Save TIFF image of individual frames |
| | Save individual cell data to ASCII (requires Edit Tracks) |
| | Save data points to ASCII file (requires Edit Tracks) |

**Security**

| | |
|---|---|
| HT User Groups*: | Administrative or Basic user |
| Password Security: | Windows-based Users |
| | Unlimited User IDs and passwords |
| Setup Access: | Analysis Setups restricted to Administrator users only |

* Not available on Legacy HT CASA.
† Not available on CEROS.

**Included Data Management Options**

| | |
|---|---|
| ASCII Export: | Transfer of summary data and/or individual track to ASCII compatible spreadsheet or database programs. |
| ASCII Import: | Import of select sample information. |
| Video Storage: | Ability to save video file of each field analyzed, along with sample information and analysis setup values. Recall and analyze video with saved settings or new settings. Re-analyze single videos or entire analysis sets. |
| Report Viewer: | View analysis data in report format. |
| Report Designer*: | Report designer and manager to create unlimited professional reports from sperm analysis results. Ability to include all data (calculated and user input), images, and logo. Drag and drop design, snap-to alignment. Ability to combine motility and Dimensions II Morphology results in single report. |

**Optional Special Applications**

| | |
|---|---|
| IQC Module*: | Internal Quality Control software to method of verifying objective calibration and monitoring quality control counts. Includes Levey-Jennings Chart and application of Westgard Rules. User-selectable time frame. |
| Sort: | Segments sperm into sub-populations based on kinematic and/or morphometric parameters. |
| Edit Tracks: | Save individual track data to ASCII output plus ability to manually delete tracks from cell population. |
| IDENT†: | Automated motility analysis of high-detritus samples using DNA-specific, fluorescent stain and integrated fluorescent illumination. |
| VIADENT†: | Sperm viability assessment software option. Stain sperm with non-membrane permeable DNA stain and calculate viable sperm numbers under fluorescence (requires IDENT option). |

**Analysis Sets:** Unlimited, User-defined by administrator

**Analysis Setup Parameters (Administrative Users Only)**

| | | |
|---|---|---|
| Setup: | Setup Name | |
| Analysis Limits: | Min Motility (%) | Min Progressive (%) |
| | Min Total Count | |
| Calibration: | Objective Name | |
| | X-axis Magnification | Y-axis Magnification* |
| Camera: | Exposure (ms) | Gain |
| | Integrate Enabled | Integrate Time (ms) |
| Cell Detection: | Elongation Max (%) | Enable Advanced Tail Detection* |
| | Elongation Min (%) | Tail Min Brightness Mode* |
| | Head Brightness Min | Head Size Max ($\mu m^2$) |
| | Head Size Min ($\mu m^2$) | Static Tail Filter* |
| | Tail Brightness Min* | Tail Min Brightness Auto Offset* |
| Chamber: | Capillary Correction | |
| | Chamber Depth (µm) | |
| | Chamber Type (Capillary, Drop) | |
| Illumination: | Illumination Primary *† | |
| | Max Photometer | |
| | Min Photometer | |
| Kinematics: | Cell Travel Max (µm) | Slow VAP (µm/s) |
| | Enable Motile Static Collisions Avoidance* | Slow VSL (µm/s) |
| | Motile Cell Require Tail* | Static Algorithm* |
| | Motile Require Tails Max VSL (µm/s) * | Static VAP (µm/s) |
| | Progressive STR (%) | Static VSL (µm/s) |
| | Progressive VAP (µm/s) | Static Width Multiplier* |
| Morph: | Min Tail Length (µm) * | |
| | Tail Confidence (%) * | |
| Stage: | Stage Temp (°C) *† | |
| VIADENT†: | VIADENT Fluorescing System | |
| Video Capture: | Frame Capture Speed (Hz) | |
| | Frame Count | |
| | Image Type | |

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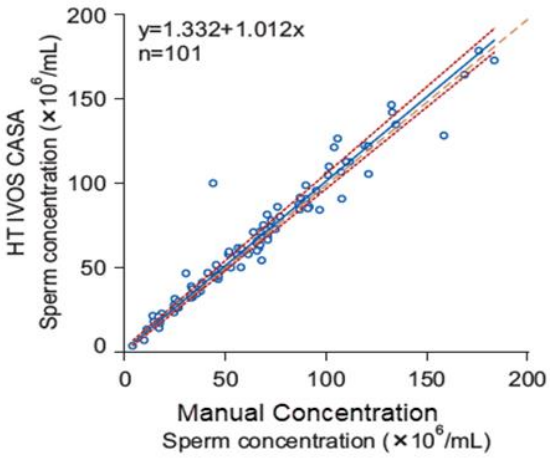
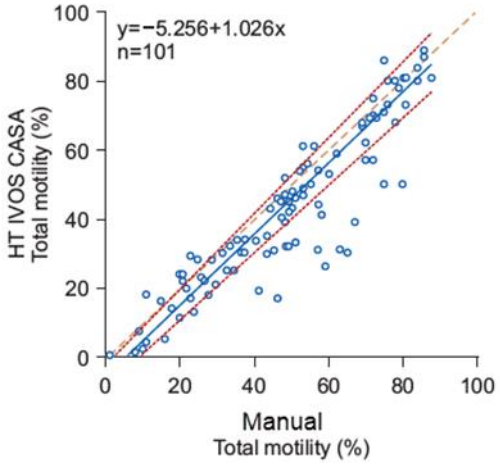
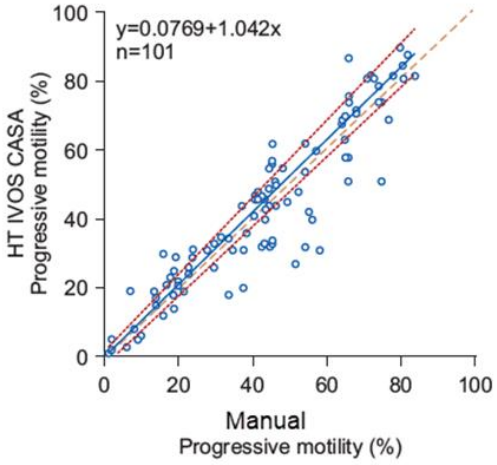
**Concentration**
**(Correlation Analysis, Pearson's correlation coefficient)**




**Motility (TM, Total Motility)**
**(Correlation Analysis, Pearson's correlation coefficient)**




**Progressive Motility (PR, Progressive Motility)**
**(Correlation Analysis, Pearson's correlation coefficient)**




**Precision and Accuracy of HT CASA II in evaluating Sperm Concentration, Total Motility and Progressive Motility compared to Manual Semen Analysis**

| | Precision | Accuracy |
|---|---|---|
| Concentration | 0.97 | 0.99 |
| Total Motility | 0.92 | 0.97 |
| Progressive Motility | 0.93 | 0.99 |

**Operational Range**

| | Minimum | Maximum |
|---|---|---|
| Sperm Concentration | 2 M/ml | 100 M/ml |
| Progressive Concentration | 2 M/ml | 100 M/ml |
| Progressive Motility | 2% | 100% |
| Motility | 2% | 100% |

Agarwal A, Panner Selvam MK, Ambar RF. Validation of LensHooke® X1 PRO and Computer-Assisted Semen Analyzer Compared with Laboratory-Based Manual Semen Analysis. World J Mens Health. 2021 Jul;39(3):496-505. doi: 10.5534/wjmh.200185. Epub 2021 Feb 5. PMID: 33663026; PMCID: PMC8255407.