ECASA

Computer Assisted Semen Analysis

Overview:

- ECASA is a combination of hardware and software components to
- Prepare CASA standard report
- Archive semen case studies (videos, images, and reports)
- Calculate semen analysis parameters (count, motility, and head morphology) automatically
- CD contains case study information and results

Hardware components

Microscope Tri-Head, # Boxed CCD camera, # PC, or Laptop with windows XP or later, # Video-In card, and # a video cable

Software components

ECASA software license

www.trustdiagnosticseg.com

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Advantages:

❖ *Archiving*
- Each case has basic data (name, age, etc) and contains several studies
- Each study has a date with parameters, images, videos, and report
- A searching tool to retrieve and review cases easily
- A statistical tool to follow-up parameters values of studies with charts
- Backup & Restore procedures

❖ *Reporting*
- Full customized header and footer design
- Printed Report based on WHO standards
- Report is supported by images, and charts

❖ *Calculation*
- Capture still images to calculate morphology
- Record videos to calculate count, and motility
- Case study can be saved to be calculated later
- Files can be added to study any time
- Automatic count, and motility calculation
- Automatic head morphology calculation
- Parameters can be manually updated
- Sperms can be manually updated

❖ *CD Burn*
- A case study can be burned to a CD
- CD will include images, and report
- CD has a player to browse the study

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Sample Preparation:

To get the most efficiency should consider the following when preparing a sample for semen analysis

- Ensure well cleaning of slide & cover
- Well semen sample homogenate, this will help the system in concentration calculation
- Use a heavy cover to have one field under the microscope, this will help in motility parameters
- Use a suitable dyed sample for morphology (the akrosome area will be lighter in color than the rest of the sperm head)

Motility Sample

Morphology Sample

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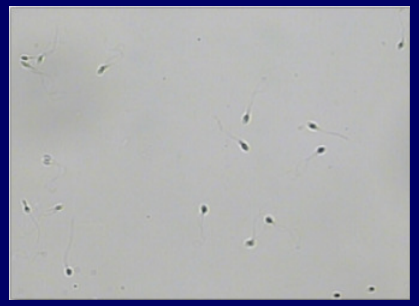
Calibration:

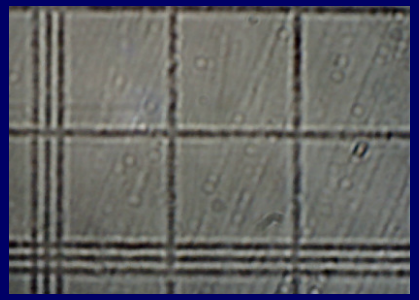
You will need a good semen sample and a calibrated slide to proceed in the calibration process, you need this process only the first time you run the system

Motility

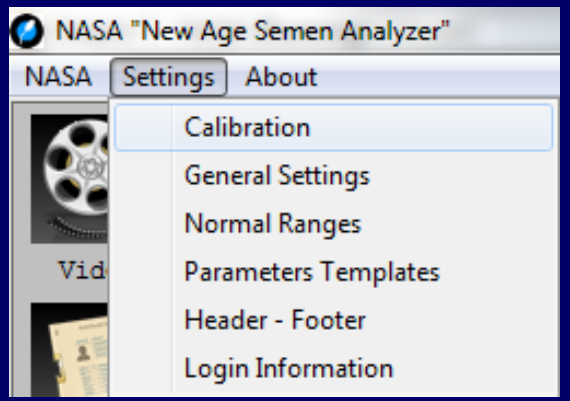


Morphology

Calibrated



From “Settings” menu select the item “Calibration” to start calibration



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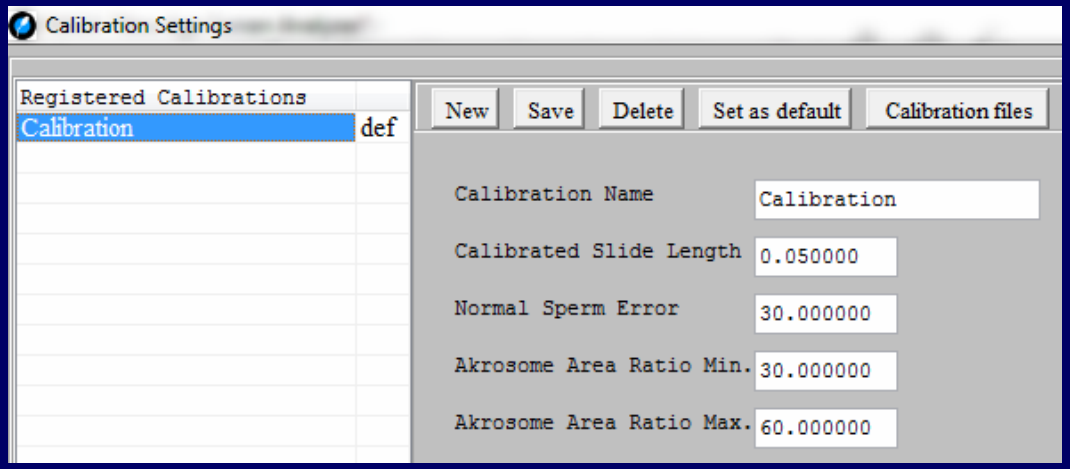
- The list on the left shows the calibration systems (you can make several calibration system).

-On the right of the list, you can use the tool bar to add, save, and delete calibration

- The button “Calibration files” starts calibration

- The button “Set as default” sets the default one

- The edit boxes sets the calibration system properties as follows:



- Calibration Name = a name of the calibration system to be assigned to studies
- Calibrated Slide Length = the real length of the calibrated slide rectangle edge in mm
- Normal Sperm Error = percentage of the error factor of normal sperm volume
- Akrosome Area Ratio Min. = the minimum area percentage of the normal akrosome
- Akrosome Area Ratio Max. = the maximum area percentage of the normal akrosome

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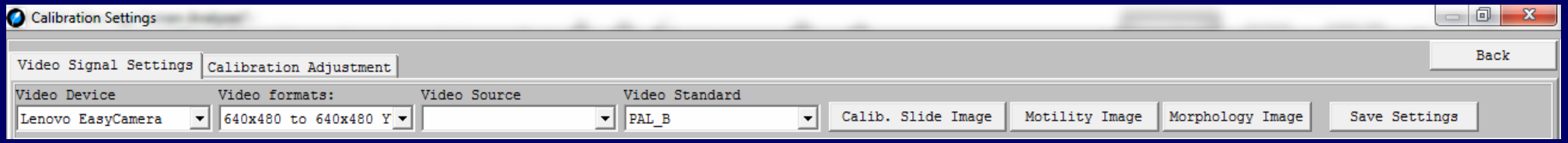

The first page of the “Calibration Files” window is the “Video Signal Settings”, the lists shown will set up the video device properties

The first lists the video devices plugged to the computer

The next lists the available video formats of the selected device

The next lists the video inputs assigned to the selected device

The last one lists the video standards

Put the calibrated slide and use the lens 20, then press the button “Calib. Slide Image”

Put the semen sample and use the lens 20, then press the button “Motility Image”

Put the morphology sample and use the lens 100, then press the button “Morphology Image”

Finally press the button “Save Settings”

Now move to the second page “Calibration Adjustment” to complete your work

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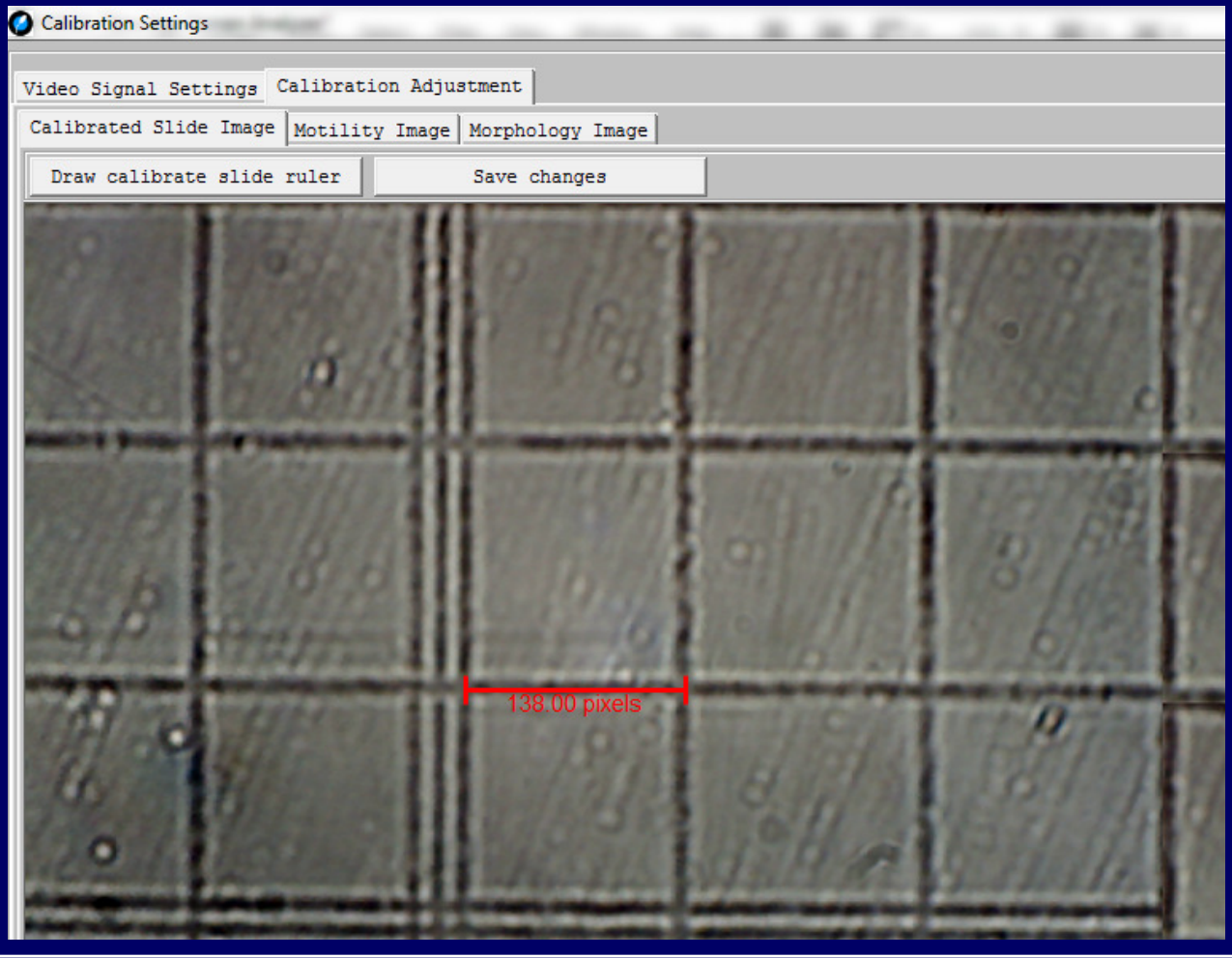
The first page of the “Calibration Adjustment Window” shows the pre-captured calibrated slide

Use the button “Draw calibrated slide ruler” to drag a line to determine the box edge of the smallest rectangle

Press the button “Save changes” to save your work



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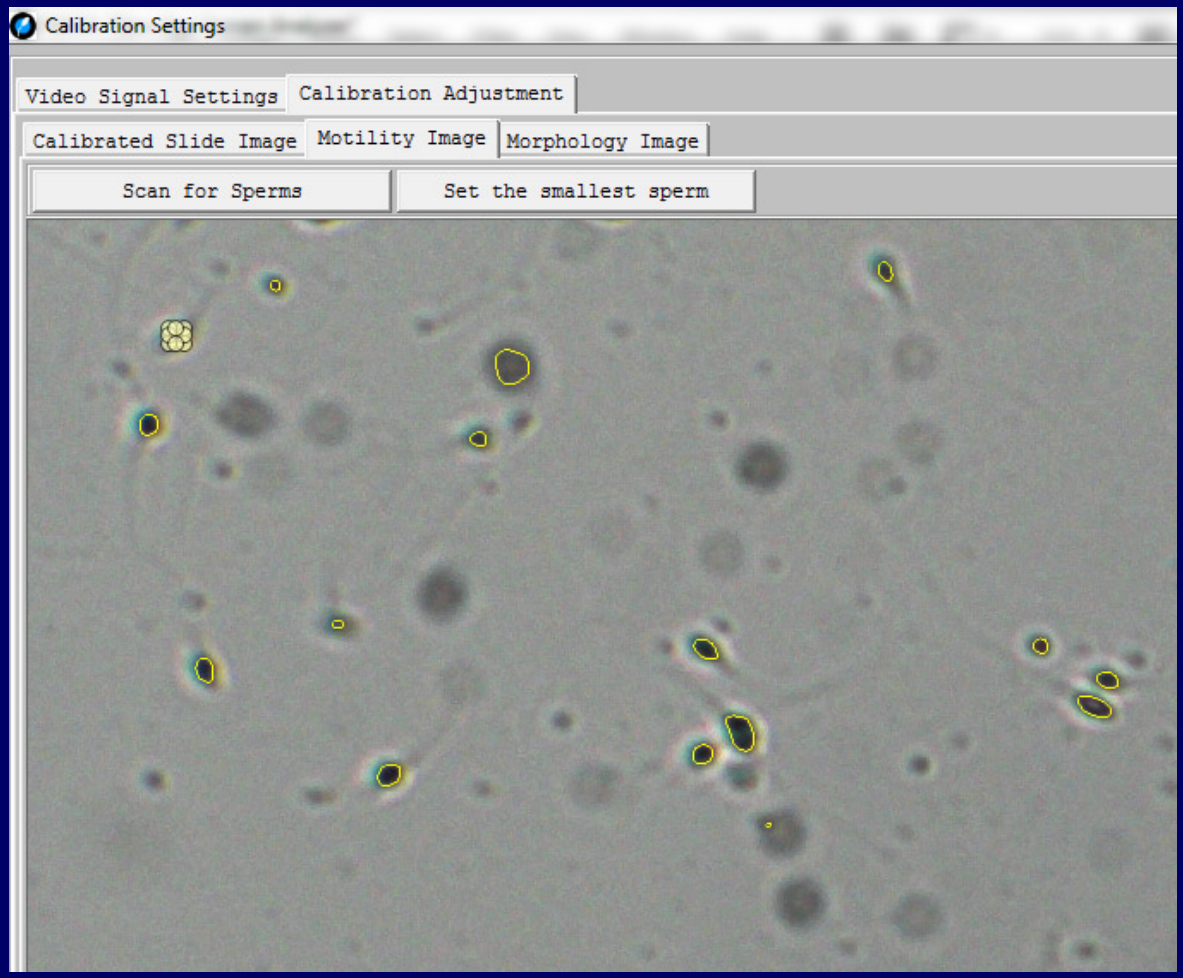
The second page of the “Calibration Adjustment Window” shows the pre-captured motility slide

Use the button “Scan for sperms” to select all sperms on the sample, then select the smallest sperm by clicking on it

Finally press the button “Set the smallest sperm” to save your work



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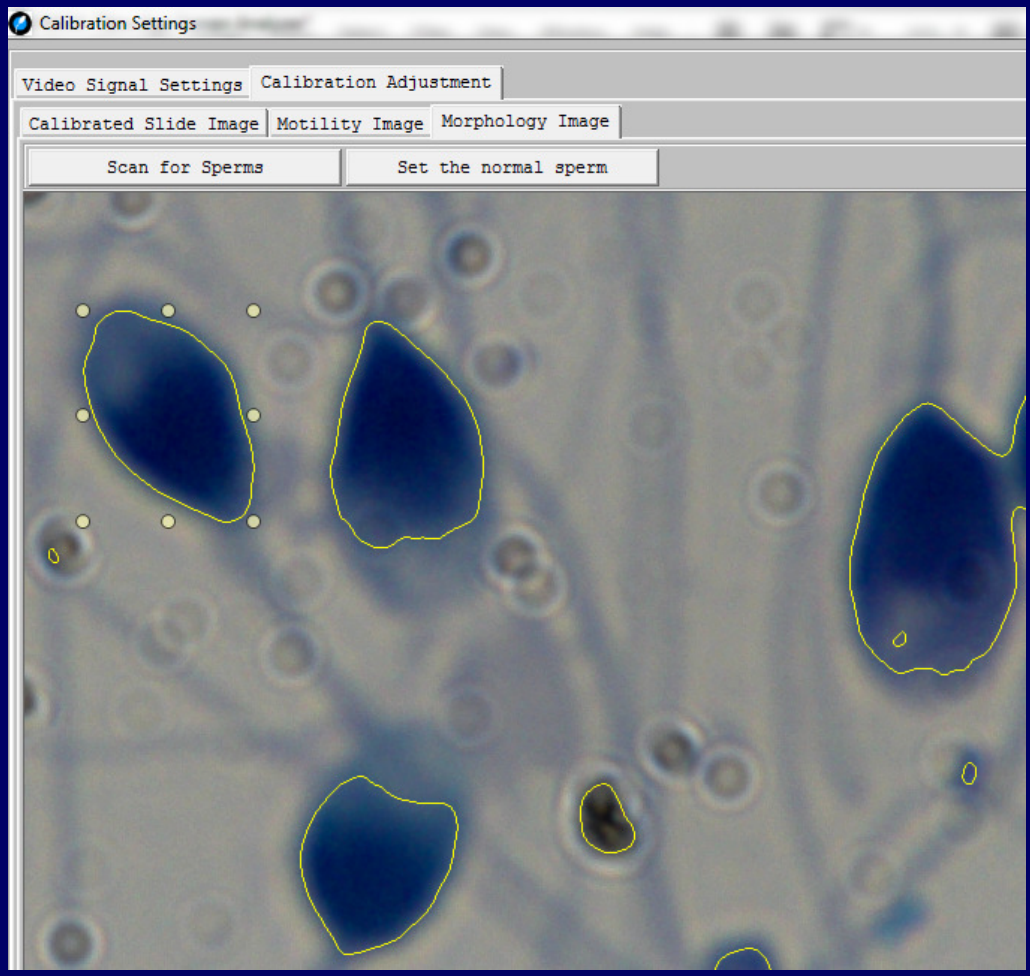
The third page of the “Calibration Adjustment Window” shows the pre-captured morphology slide

Use the button “Scan for sperms” to select all sperms on the sample, then select the normal sperm by clicking on it

Finally press the button “Set the normal sperm” to save your work



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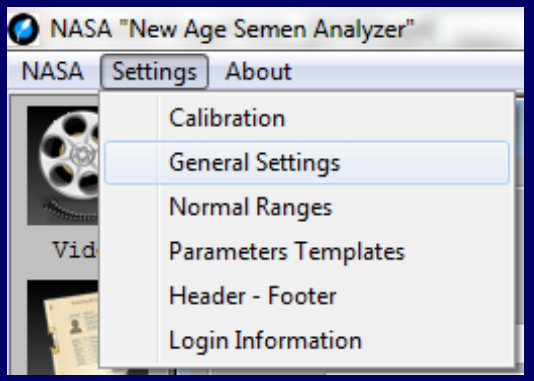
From “Settings” menu select the item “General Settings” to open the general settings window in which you can set the general settings of the system



On the left you can set the study folder in which the system will save the images, videos, and reports of studies

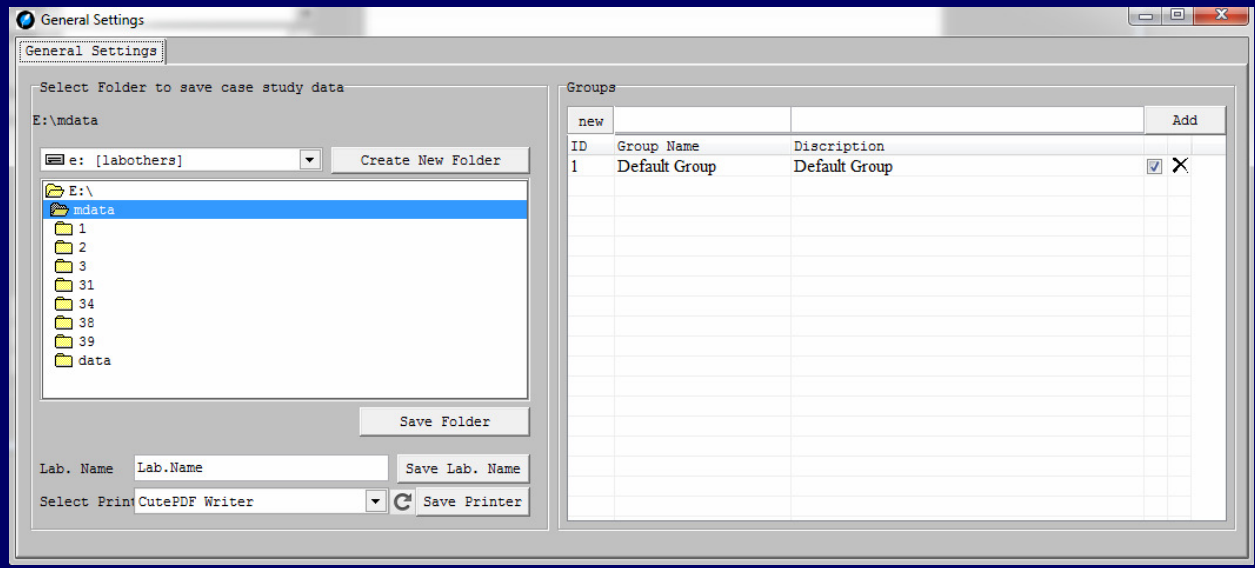
Also set the lab name, and the default printer to print the report

On the right you can determine the groups

it is a way to organize case studies,

set the group name and description

the check box to set the default group



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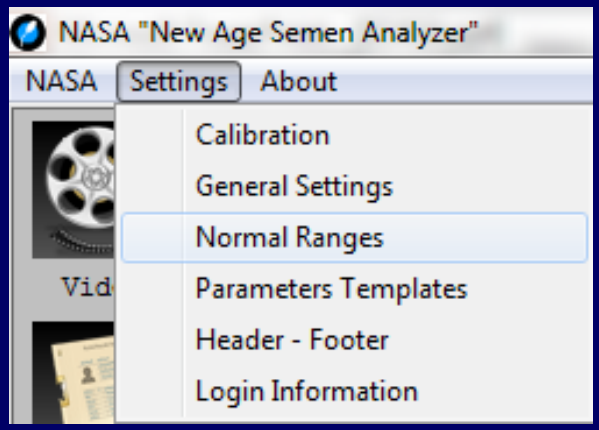
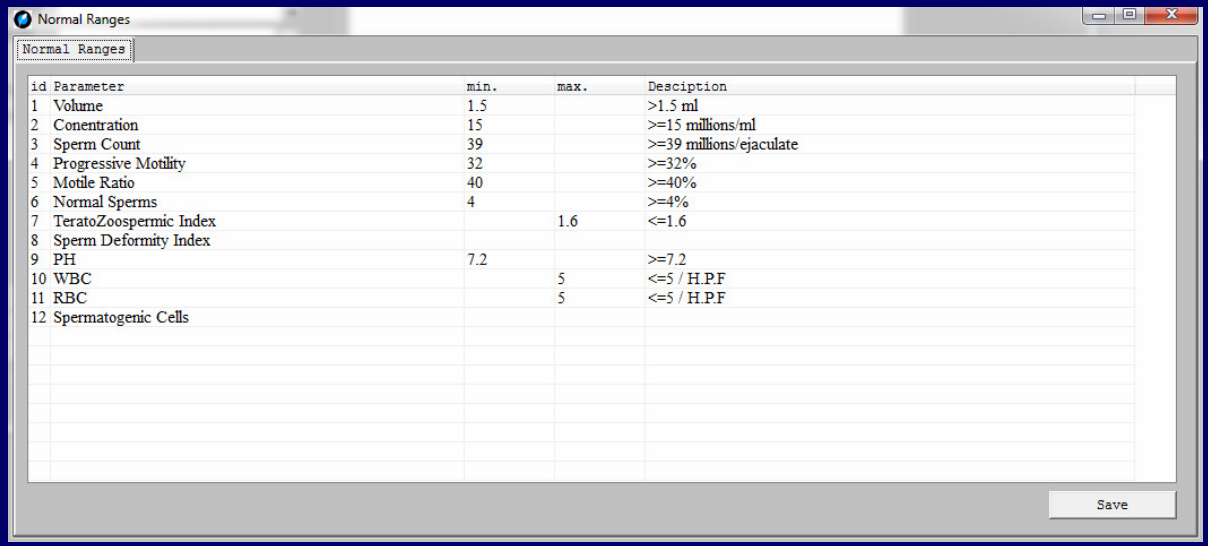
From “Settings” menu select the item “Normal Ranges” to open the normal ranges window in which you can set the normal ranges of the semen analysis parameters to be checked automatically by the system after calculation



Set the min. and the max. values of the normal ranges, and leave blank for nothing

The last column “Description” shows the values that will be printed as a suffix of the parameter



id	Parameter	min.	max.	Desciption
1	Volume	1.5		>1.5 ml
2	Conentration	15		>=15 millions/ml
3	Sperm Count	39		>=39 millions/ejaculate
4	Progressive Motility	32		>=32%
5	Motile Ratio	40		>=40%
6	Normal Sperms	4		>=4%
7	TeratoZoospermic Index		1.6	<=1.6
8	Sperm Deformity Index			
9	PH	7.2		>=7.2
10	WBC		5	<=5 / H.P.F
11	RBC		5	<=5 / H.P.F
12	Spermatogenic Cells			

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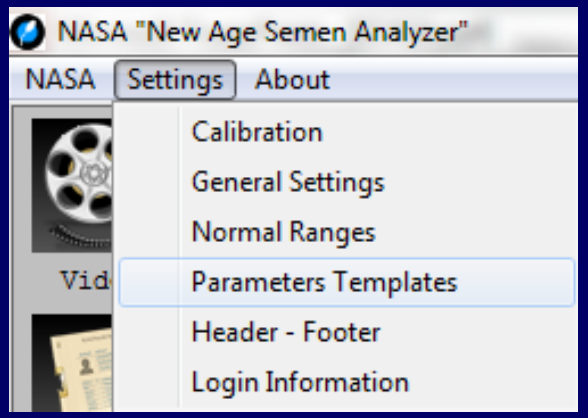
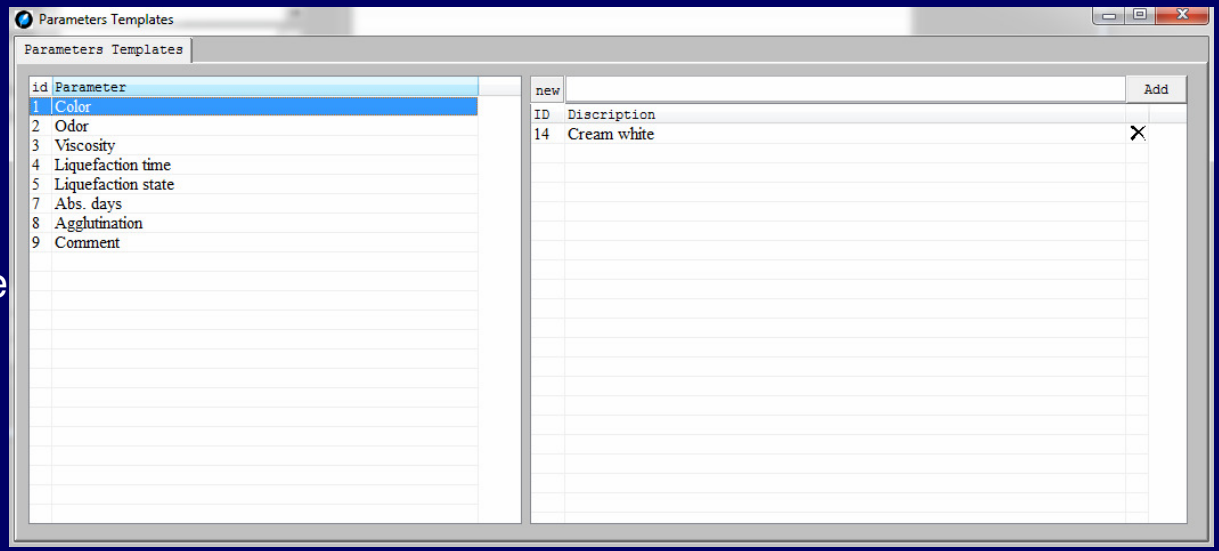
From “Settings” menu select the item “Parameters Templates” to open the parameters templates window in which you can set the templates of the parameters to be used as an auto-complete list in the study

On the left you can see the parameters list, selecting a parameter from that list will show the assigned templates



Type the template in the top text box and press “Enter” to add

Use the “Delete” icon of each row to remove the template



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From “Settings” menu select the item “Header - Footer” to open the design window in which you can set the header & footer dimensions and design

The top list lists the designs, selecting a design will show it’s properties

Design name = a name of the design to be used in the study

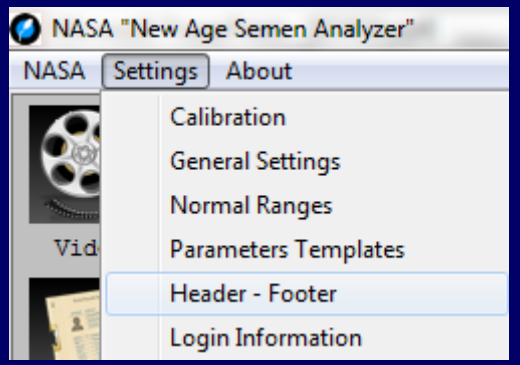
Page style = [printed , empty] (select printed if you have a prepared page, or select empty if you want the system to design the header and footer on an empty paper

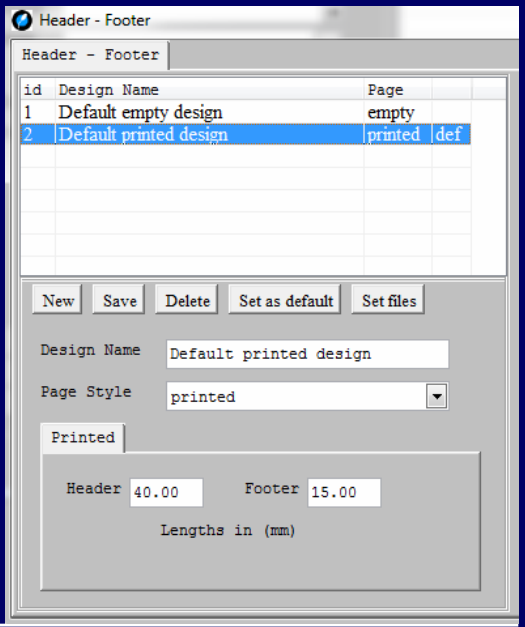
In case of printed paper you should determine the printed header and footer heights in (mm)

In case of empty paper you should determine the mode of header [single image, or logo & text], and the mode of footer [single image, or text]

Use the buttons (“new”, “save”, “delete”, “set as default”, and “set files”) to manage the designs information

Pressing the button “Set files” to open the design window for empty paper





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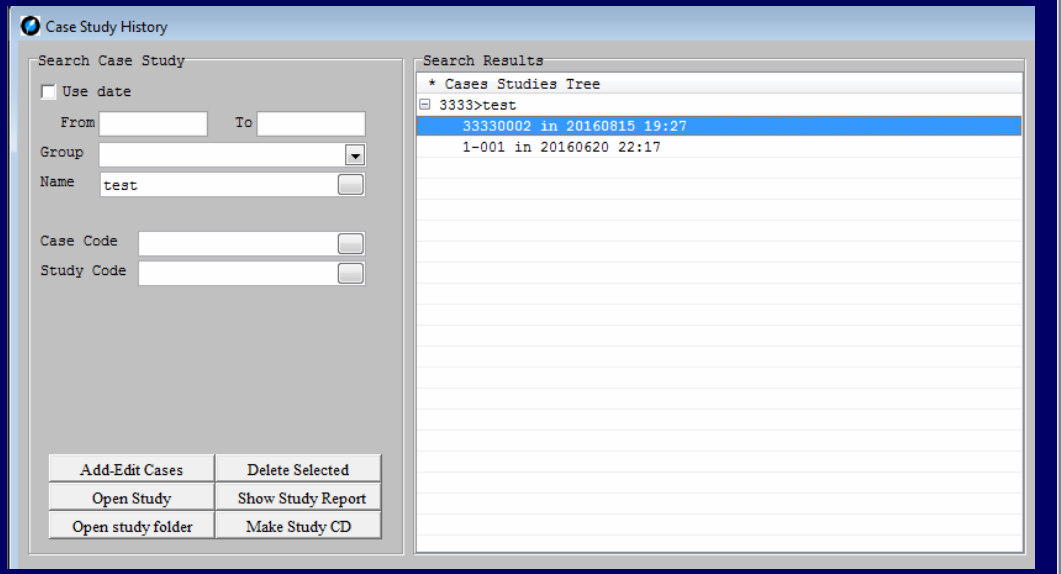
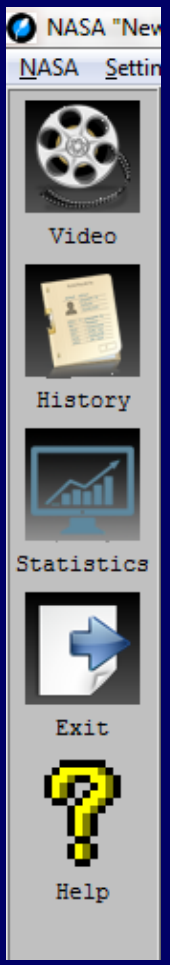
The main window tool buttons are
“Video” > opens the video window to add studies, “History” > opens the history window to search case studies, “Statistics” > opens the statistics window, “Exit” > exits the system, “Help” = opens this file
History window
You can search case studies by (case code, study code, case name, and narrow the search by date interval
The search results will be shown in the tree view, the major item is the case and the children are the studies of the that case ordered by date





The tool buttons on are
“Add-Edit Cases” = opens the cases information window
“Delete Selected” = deletes the selected case or study
“Open Study” = opens the selected study for browsing and calculation
“Show Report” = opens a quick view of the selected study report if exists
“Make CD” = opens the burning room to make a CD contains study files
“Open study folder” = opens the study folder contains the study files

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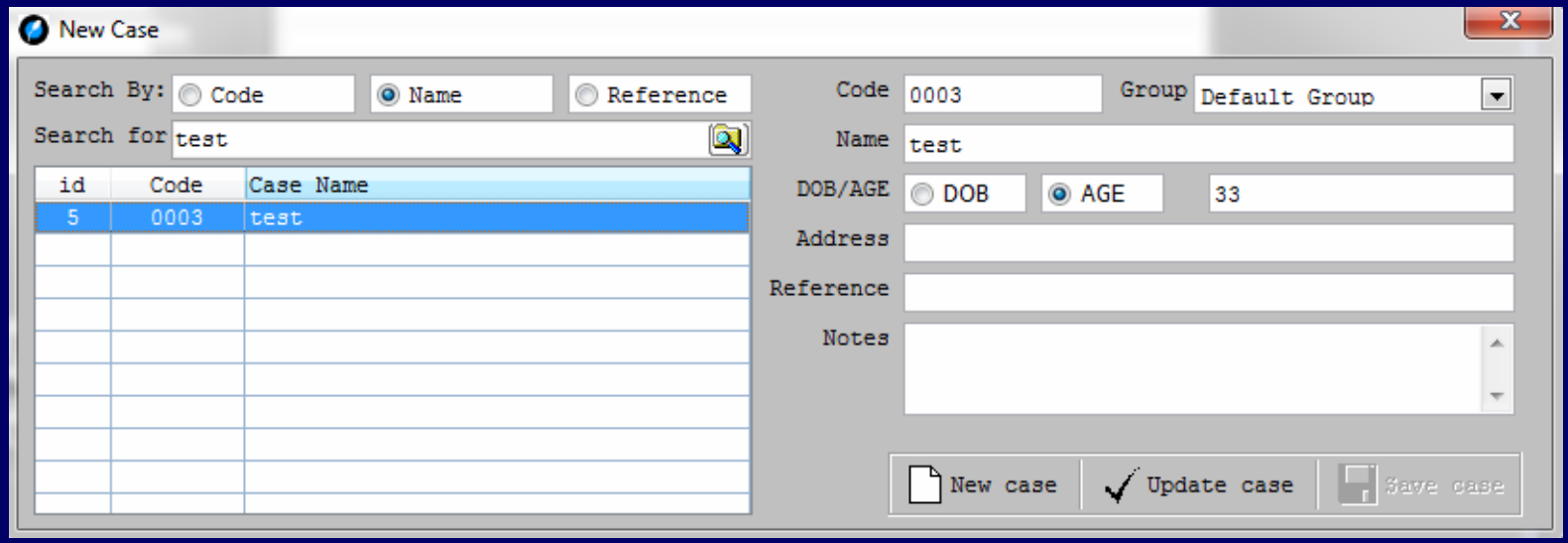
The cases window contains the case information

You can search case by code, name, or ref. then you can edit case information (code, name, age, address, ref., and notes

“New case” button to add a new case (patient)

“Save case” to save the new case (patient) information

“Update case” button to update an existing case (patient)



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The video signal window where you can connect to the video signal to make studies,

The second button “Settings” enables you to change video signal settings

The first button “Patient” enables you to add case study information

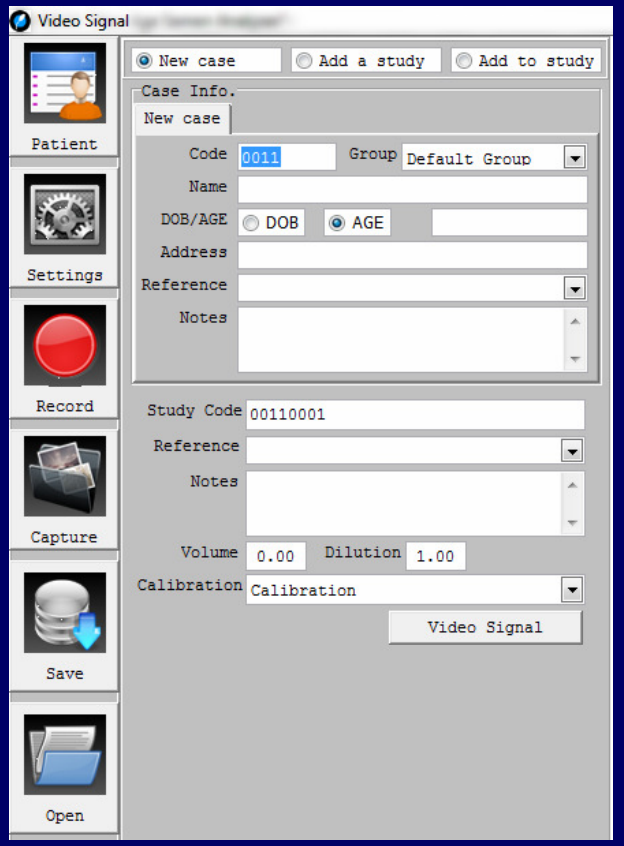
You have 3 possibilities as shown in the top radio buttons

New case (patient), new study for an existing case, and add files to an existing study.

Select (new case) procedure if it is the first time you meet this case (patient)

The case code and the study code will be generated automatically, then fill case study data (name, age, address, Ref., volume, and dilution if exists). You can select the calibration from the last drop down list (the default calibration will be selected automatically)

Finally press the button “Video Signal” to start connecting video



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The video signal window where you can connect to the video signal to make studies

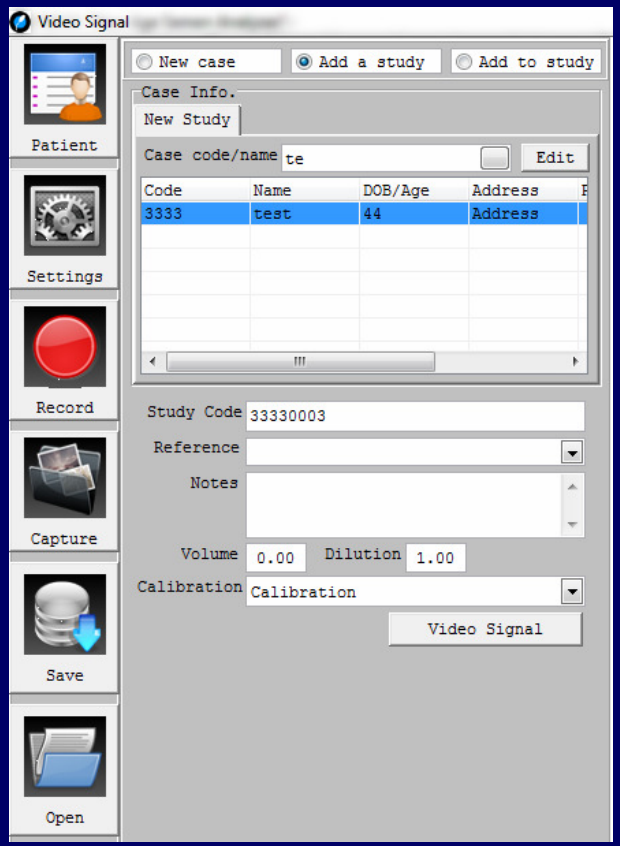
You have 3 possibilities as shown in the top radio buttons

New case (patient), new study for an existing case, and add files to an existing study.

Select (add a study) procedure if you want to make a study for an existing case (patient)

Search for the case (patient) by type the code or name and press “Enter”, the cases will be listed, select the case by clicking on it, the study code will be generated automatically, then fill study data (Ref., volume, and dilution if exists). You can select the calibration from the last drop down list (the default calibration will be selected automatically)

Finally press the button “Video Signal” to start connecting video



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The video signal window where you can connect to the video signal to make studies

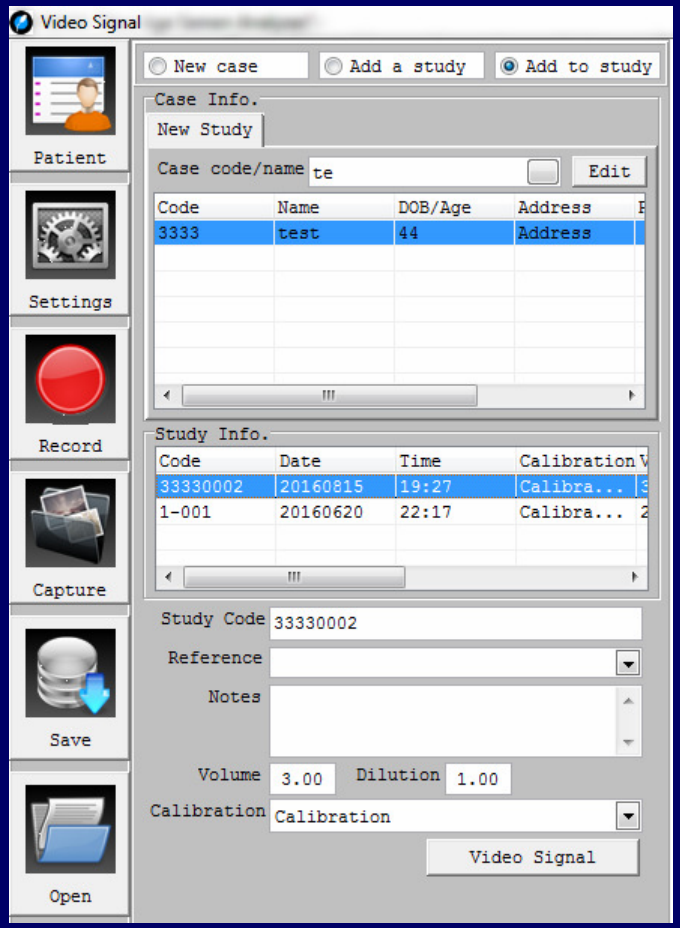
You have 3 possibilities as shown in the top radio buttons

New case (patient), new study for an existing case, and add files to an existing study.

Select (add to study) procedure if you want to add files to an existing study

Search for the case (patient) by type the code or name and press “Enter”, the cases will be listed, select the case by clicking on it, the studies will be listed, select the study by clicking on it,

Finally press the button “Video Signal” to start connecting video



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When connecting the video signal the sample will appear

Put the motility sample, and use the lens 20

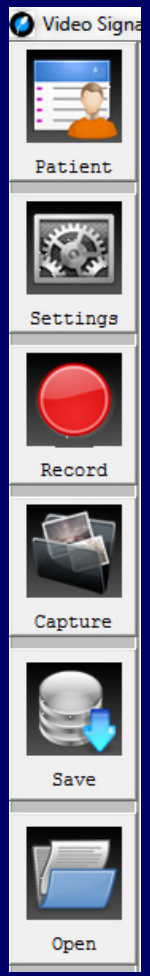
Use the button “Record” to record videos for calculating count, and motility parameters

Put the morphology sample, and use the lens 100

Use the button “Capture” to capture still images for morphology parameters

Use the button “Save” to save study files

Use the button “Open” to save the study files and move to study window to calculate



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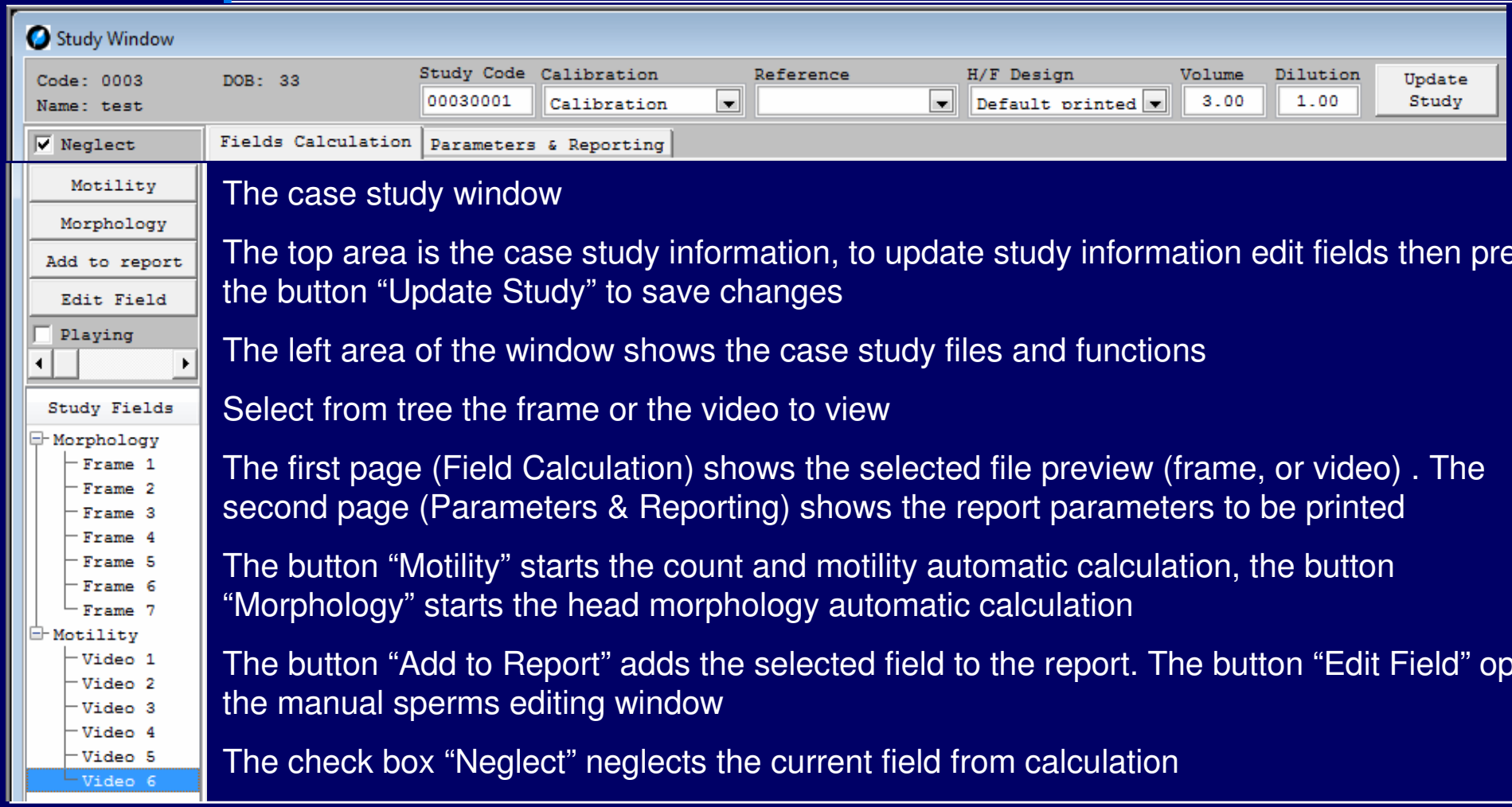

The case study window

The top area is the case study information, to update study information edit fields then press the button “Update Study” to save changes

The left area of the window shows the case study files and functions

Select from tree the frame or the video to view

The first page (Field Calculation) shows the selected file preview (frame, or video) . The second page (Parameters & Reporting) shows the report parameters to be printed

The button “Motility” starts the count and motility automatic calculation, the button “Morphology” starts the head morphology automatic calculation

The button “Add to Report” adds the selected field to the report. The button “Edit Field” opens the manual sperms editing window

The check box “Neglect” neglects the current field from calculation

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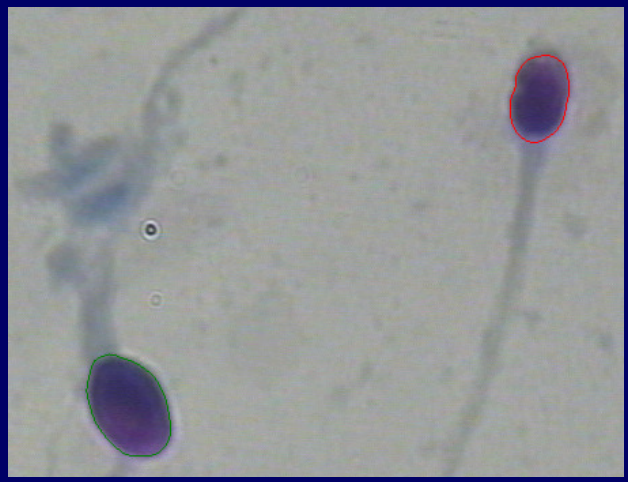
After automatic calculation

The sperms in morphology field will be marked as shown where the normal sperm will be marked with green color, otherwise the abnormal sperm will be marked with red color



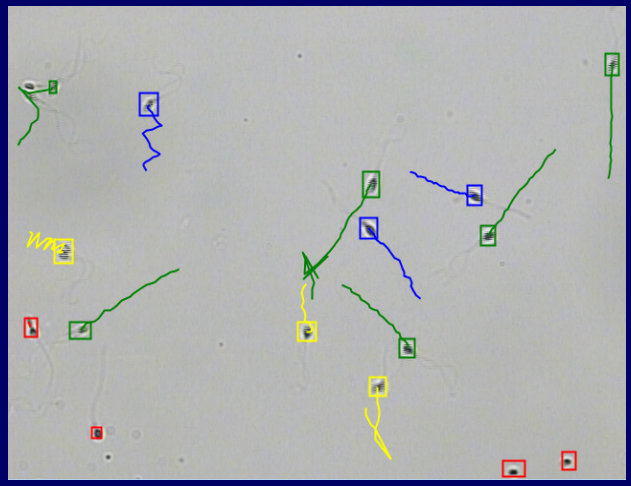
The sperms in motility field will be marked as shown where:

The motion path of class A sperms will be marked with green color

The motion path of class B sperms will be marked with blue color

The motion path of class C sperms will be marked with yellow color

The class D sperms will be marked with red color



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Edit morphology field window

In this window you can edit field after automatic calculation

Select a sperm will list the abnormality types on the left list, check / uncheck abnormality types.

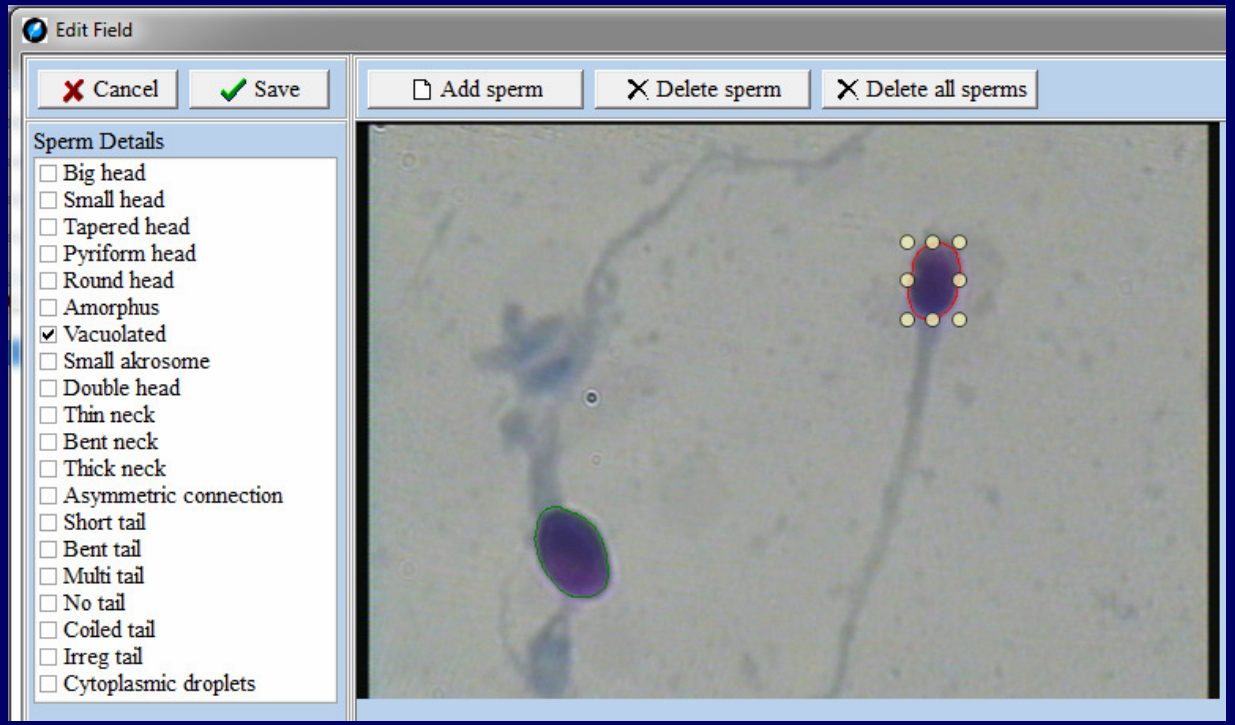
Also you can use the buttons on the top:

“Add sperm” to add sperms if not marked

“Delete sperm” to delete any marked body that is not a sperm

“Delete all sperms” to delete all

Any changes will reflect the results, when you press “Save”, otherwise “Cancel” will discard changes



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Edit motility field window

In this window you can edit field after automatic calculation you can use the buttons on the left:

“Delete sperm” to delete any marked body that is not a sperm

“Delete all sperms” to delete all

“Add immotile sperm will add an

Immotile sperm

“Add motile sperm” will add a sperm and

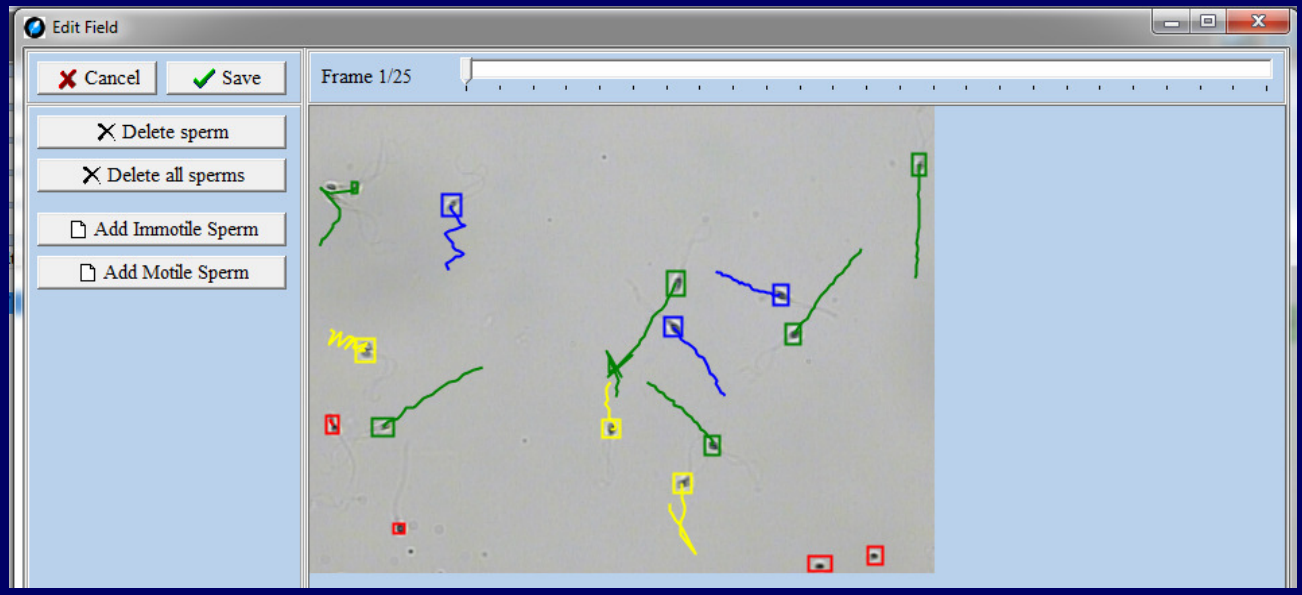
it’s motion path

Use the top track bar to view frames

Any changes will reflect the results,

when you press “Save”, otherwise

“Cancel” will discard changes



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Prepare parameters to print report

In the first page you can find and edit parameters results field after automatic calculation

In the next page you can find the images you added,

you can remove from them

In the third page you can find the charts of the report,

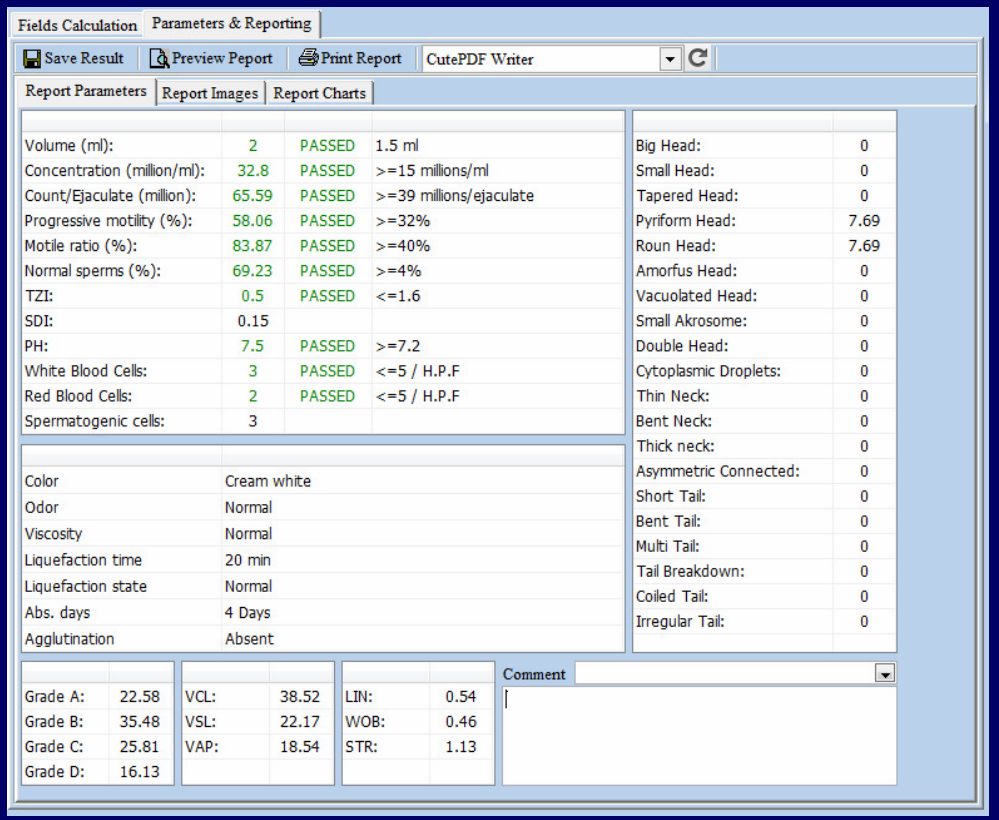
you can edit values before print

”Save Results” will save your values

“Preview Report” will open a report preview window

“Print Report” will send the report directly to the selected

printer shown in the drop down list



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Report Page 1

Contains a brief of parameters results

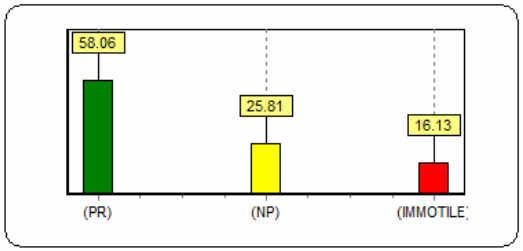
Computer Assisted Semen Analysis (E-CASA)

Case Info.: <3333> test DOB \ Age: 44
Study Date: 2016-06-20 Reference:

The system follows WHO strict criteria for motility patterns & morphometric assessment of human semen.

Physical properties

Volume (ml) :	2	1.5 ml
PH:	7.5	>=7.2
Color:	Cream white	
Odor:	Normal	
Viscosity:	Normal	
Liquefaction time:	20 min	
Liquefaction state:	Normal	
Abst. days :	4 Days	
Agglutination :	Absent	



Test Results

Parameter	Result	Status	Reference
Concentration (million/ml) :	32.8	PASSED	>=15 millions/ml
Count (million/ejaculate) :	65.59	PASSED	>=39 millions/ejaculate
Progressive motility (%) :	58.06	PASSED	>=32%
Motile ratio (%) :	83.87	PASSED	>=40%
Normal sperms (%) :	69.23	PASSED	>=4%
TeratoZoospermic Index TZI :	0.5	PASSED	<=1.6
Sperm Deformity Index SDI :	0.15		

Cells other than sperms

White blood cells :	3	PASSED	<=5 / H.P.F
Red blood cells :	2	PASSED	<=5 / H.P.F
Spermatogenic cells :	3		

Comment

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Report Page 2

Contains a details count, and motility values

Also contains details velocity distribution

WHO call this the “dynamic details”

Computer Assisted Semen Analysis (E-CASA)

Case Info.: <3333> test DOB \ Age: 44
Study Date: 2016-06-20 Reference:

Dynamic Analysis Report (CASA - WHO)

Dynamic Parameters Report (I)

Classification	Percentage (%)	Conc. (million/ml)	Total (million)
Progressive Motility	58.06	19.04	38.09
Non-progressive	25.81	8.47	16.93
Motile Ratio	83.87	27.51	55.02
Immotile	16.13	5.29	10.58

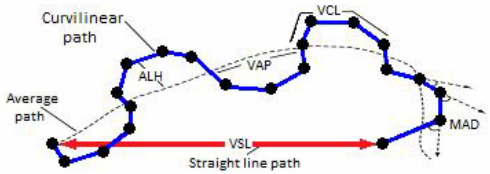
* Progressive motility (PR): spermatozoa moving actively, either linearly or in a large circle, regardless of speed.
* Non-progressive motility (NP): all other patterns of motility with an absence of progression, i.e. swimming in small circles, the flagellar force hardly displacing the head, or when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

Dynamic Parameters Report (II)

VCL	38.52	LIN	0.54
VSL	22.17	WOB	0.46
VAP	18.54	STR	1.13

VCL: Curvilinear velocity
VSL: Straight line velocity
VAP: Average path velocity

LIN: Linearity (VSL/VCL)
WOB: Wobble (VAP/VCL)
STR: Straightness (VSL/VAP)



ECASA

Computer Assisted Semen Analysis

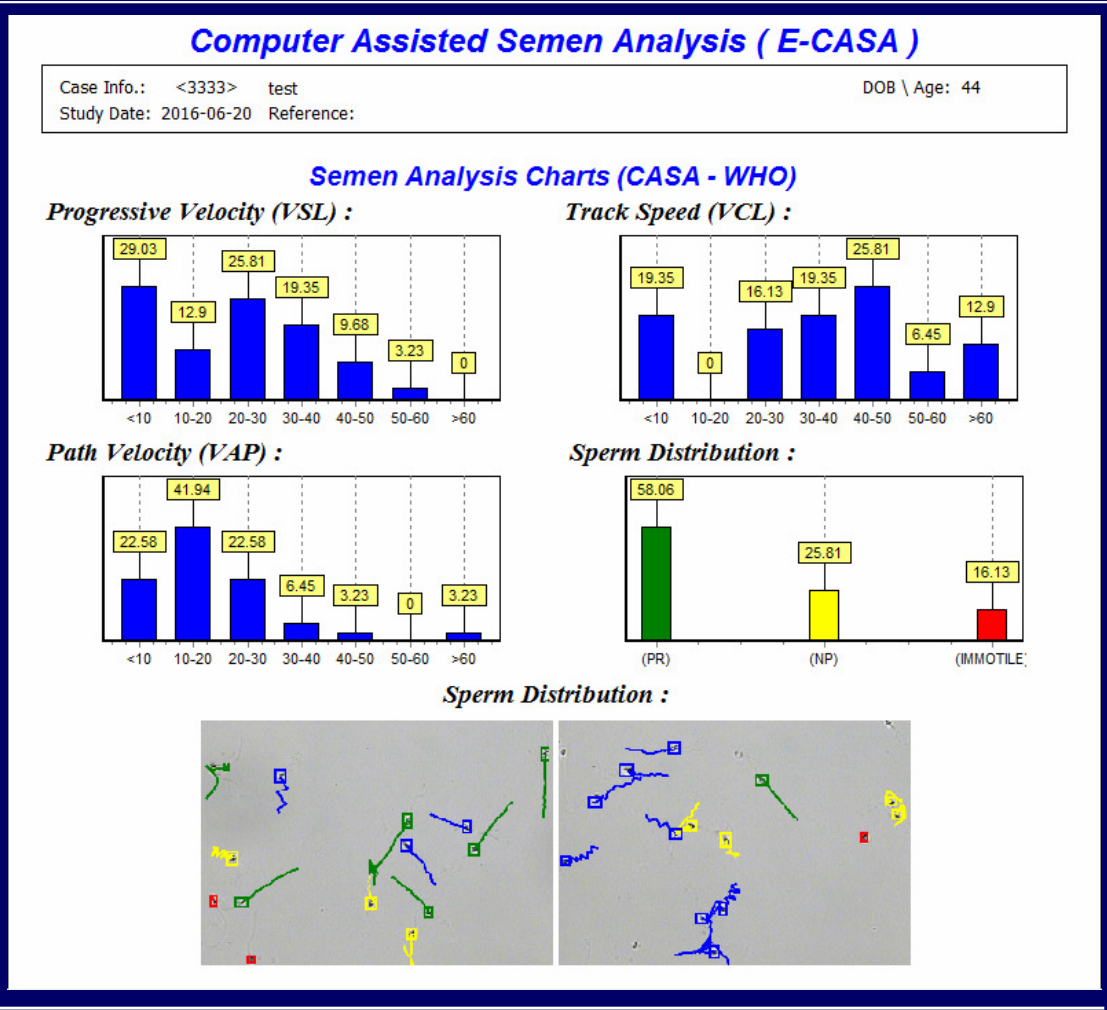
Report Page 3

Contains charts and images for dynamic parameters

Velocities chart

Sperm classification chart

Images illustrates the motion path of sperms



ECASA

Computer Assisted Semen Analysis

Report Page 4

Contains morphology details

Abnormal types percentage, TZI, and SDI

Computer Assisted Semen Analysis (E-CASA)

Case Info.: <3333> test DOB \ Age: 44
Study Date: 2016-06-20 Reference:

Morphology Analysis Report (CASA - WHO)

Normal Sperms (Morphology Index) : 69.23
Terato Sperms : 30.77

A. Head Abnormality :

Big Head	0
Small head	0
Tapered head	0
Pyriform head	7.69
Round head	7.69
Amorphus head	0
Vacuolated head	0
Small akrosome	0
Double head	0

B. Neck & Midpiece Abnormality :

Thin neck	0
Bent neck	0
Thick / irregular	0
Asymmetric connected	0

C. Tail Abnormality :

Bent tail	0
Multi tail	0
Tail breakdown	0
Coiled tail	0
Irregular tail	0
Short tail	0

D. Excess Residual Cytoplasm (E.R.C.) :

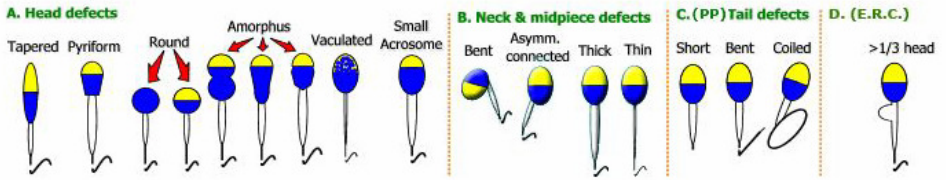
E.R.C.	0

TZI 0.5

TeratoZoospermic Index (TZI) :
Total number of defects divided by the number of abnormal sperms.

SDI 0.15

Sperm Deformity Index (SDI) :
Total number of defects divided by the number of sperms counted.

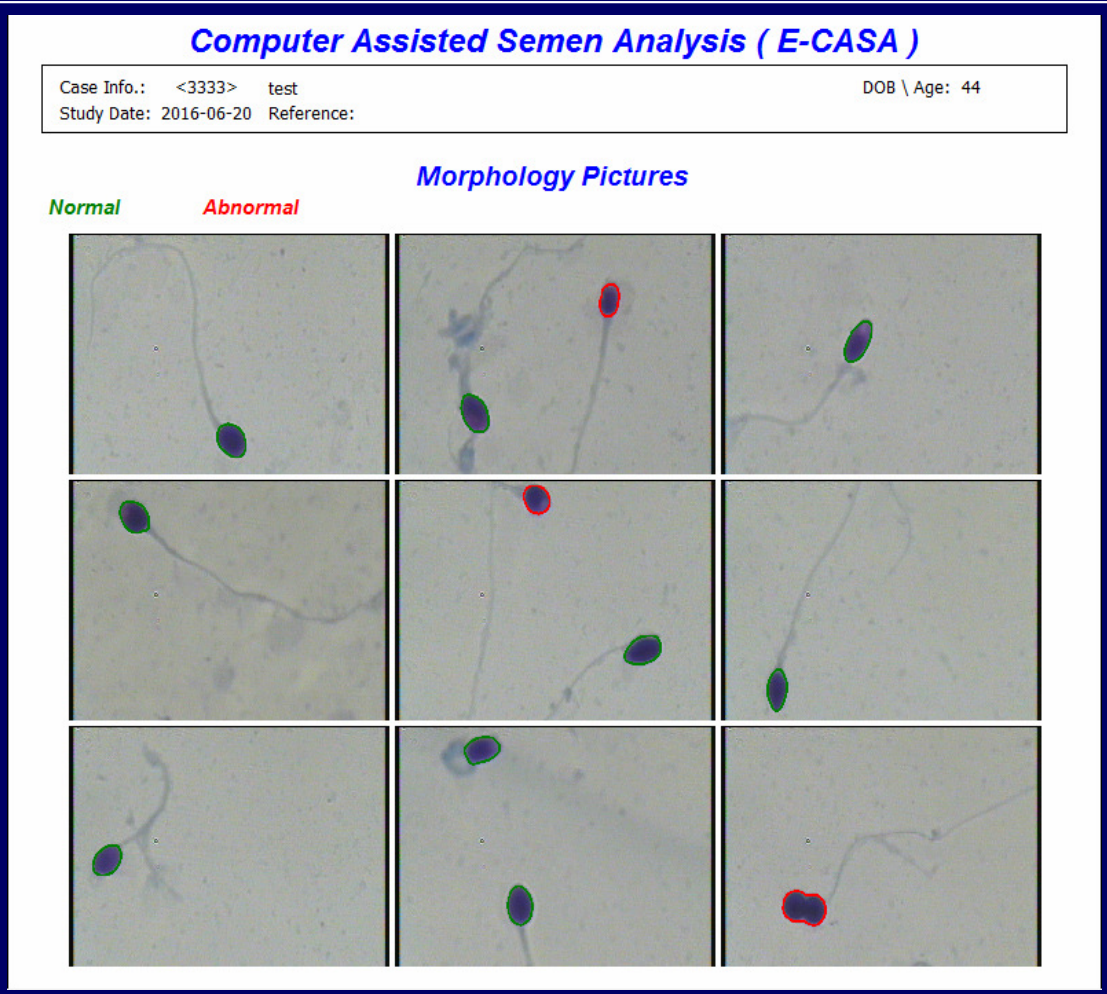


ECASA

Computer Assisted Semen Analysis

Report Page 5

Contains morphology images



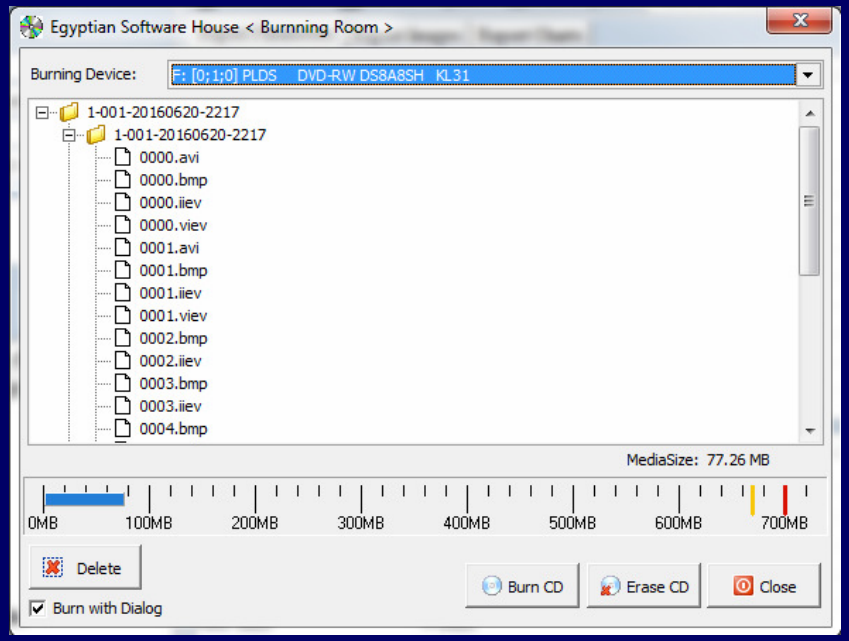
ECASA

Computer Assisted Semen Analysis

From the bottom button in the main window, press “Make Study CD” to open then burn room window

Statistics & History	Add-Edit Cases
Delete Selected	Video Signal
Open Study	Show Study Report
Make Study CD	Open study folder

The burn room window prepare study files to be burned to CD., the CD will contains a player to play the study results, and files



MOVERA
Trust our vision

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Computer Assisted Semen Analysis

THANKS