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SYSTEM COMPONENTS AND PRINCIPLES

• Basic request of system

- PCI high speed color image collecting card
- APC with Intel PentiumIII800MHz, 40GB HD and l28MB RAM.
- Tri-ocular eyepiece biological microscope
- 470 line CCD color camera
- Color inkjet printer
- 53cm color monitor
- Videotape recorder(VTR)
- Video allocator with 1 input and 4 outputs
- WLJY-9000 2.5 software
- Windows 95/98 Operation system

• NOTE:

- The configuration of PC and type of printer can be changed according to your requirement.
- Constant temperature operation desk can be provided with the microscope.
- The computer system we offered is according to the contract of sales.
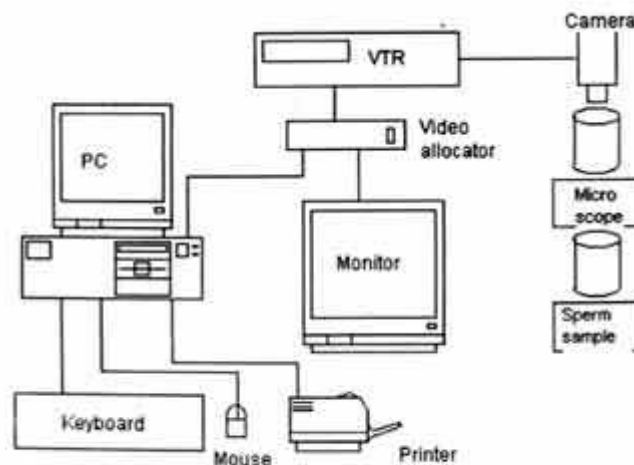
• SYSTEM CONFIGURATION

Fig 2.1 System Configuration

• ANALYSIS PRINCIPLE

After being enlarged by the microscope, a dynamic sperm images are recorded by a CCD camera.

Through VIDEO OUT of the CCD camera and VIDEO IN of a videotape recorder, the image signal is recorded on videotapes for further use. Then the image signal reaches a video allocator via VIDEO OUT of the videotape recorder. Through the video allocator, the video signal feeds the color image collection card via its VIDEO IN, at the same time; it also can reach other video set, such as television. So, the image signal can be analyzed instantly in the computer. The results can be printed out and saved on the hard disk. The system's database of patient case is in ACCESS database format and can be edited or statistically analyzed with Microsoft Access of Excel.

• TECHNICAL DATA

- Image collection speed:4-20 frames per second
- Analysis time per frame:less than 15 seconds
- Sperm velocity that can be analyzed:0-180μm/s
- Number of vision field that can be selected:1-20
- Max.number of sperm that can be analyzed:1000
- Magnifying power of microscope(object lens):10X/20X/25X/40X

• OPERATION REQUIREMENTS

- Rated Power Voltage:AC220V±10%
- Power Frequency:50Hz±2%
- Power no less than 500VA
- Temperature:10-30℃
- Relative Humidity:no more than 70%

• TERMS AND DEFINITION

TERMS	DEFINITION
Total Number of Sperm (TNS)	the total number of sperm in vision fields analyzed
Number of Movable Sperm (NMS)	The total number of movable sperm in vision fields analyzed
Motile Sperm Percentage(MSP)	NMS divided by TNS then multiplied by 100
Live Sperm Percentage	Number of live sperm identified by chromoscopy divided by total sperm then multiplied by 100
Sperm Density	the number of sperm in a unit volume (number/ml)
Total Sperm	the total number of sperm in an injection,it is equal to sperm density x sperm volume.
Progressive Velocity(VSL)	the straight distance a sperm moved

	divided by the time spent, see Fig. 2 (unit: μm/s)
Track Velocity (VCL)	the length of an actual track a sperm moved divided by the time spent, see Fig. 2 (unit: μ m/s)`
Path Velocity (VAP)	the length of an average path divided by the time spent,see Fig.2(unit: μm/s)
Linearity(LIN)	VSL/VCL
Straightness(STR)	VSL/VAP
Wobble(WOB)	VAP/VCL
Lateral Amplitude(ALH)	The maximum distance between the actual track and the average path of a sperm(unit: μm)
Mean Angle Degree(MAD)	Sum of the absolute value of an angle between two line segments on an actual sperm track divided by time spend
Beat Frequency (BCF)	Total times of cross between the actual and average path of a sperm divided by time spent unit: times/s)
Total number of sperms in line mode	When VSL/VCL>C,we say that the sperm moves in a straight line mode
Total number of sperms in curve mode	When VSL/VCL<C we say that the sperm moves in a curve line mode

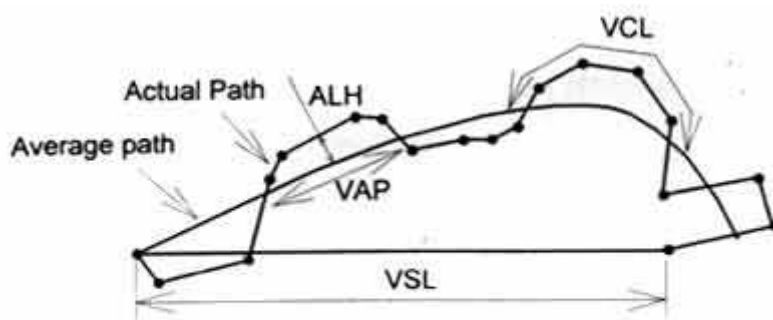**NOTE :** C is an empirical value derived from a large amount of clinical experiments

Fig. 5.1 Sperm tracks and velocities