



Dr Radhakrishnan Nair Founder Vice Chairman

Director-Androgynaecare-Cochin

Gynaecologist with a special interest in Andrology
& sexual medicine

KAUN BANEGA CROREPATHI?

MM.

Andrology

Dr Radhakrishnan Nair.

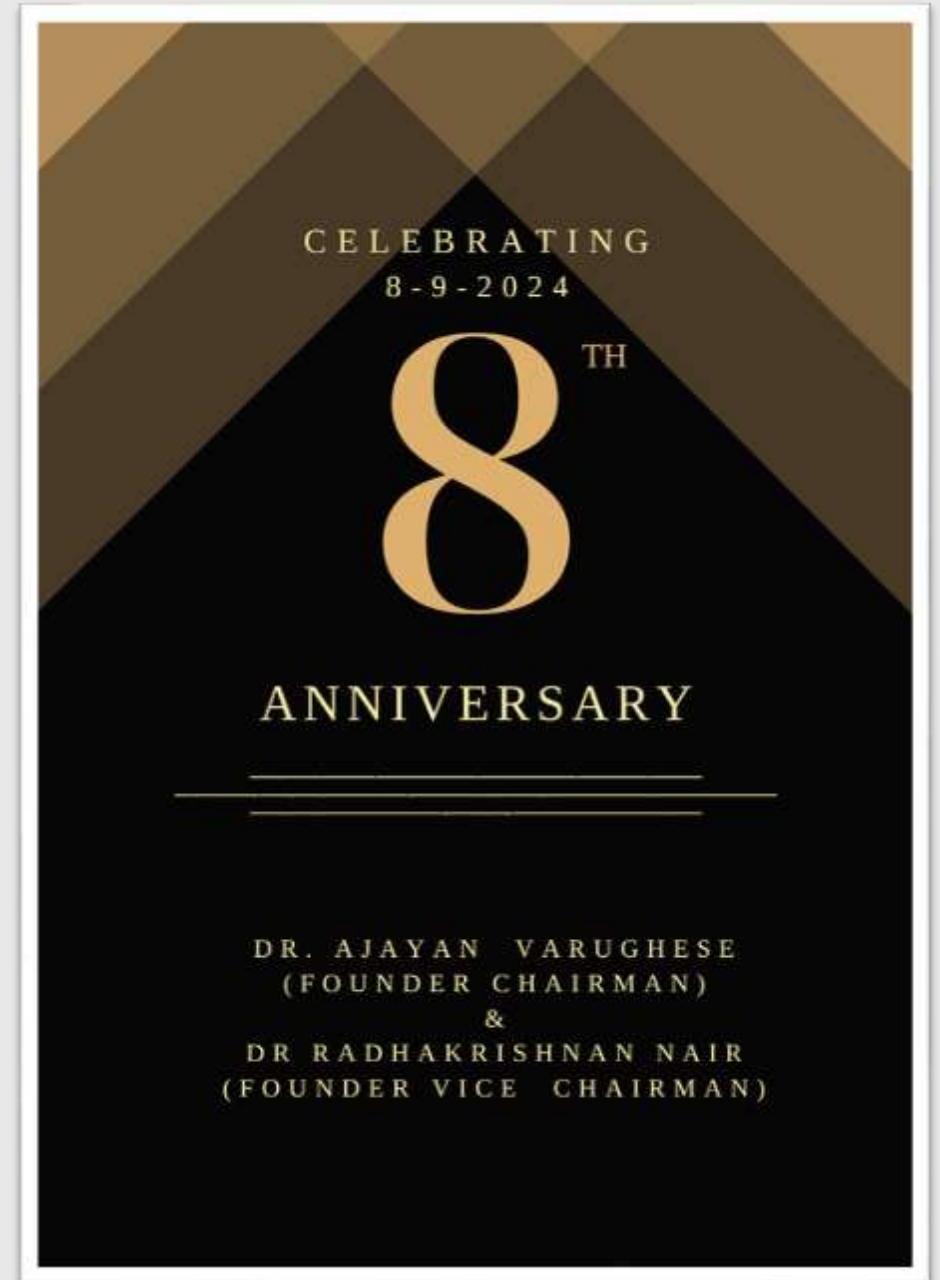
Founder Vice-chairman. IASMP

GYNAECOLOGIST.

Androgynaecare. Cochin.

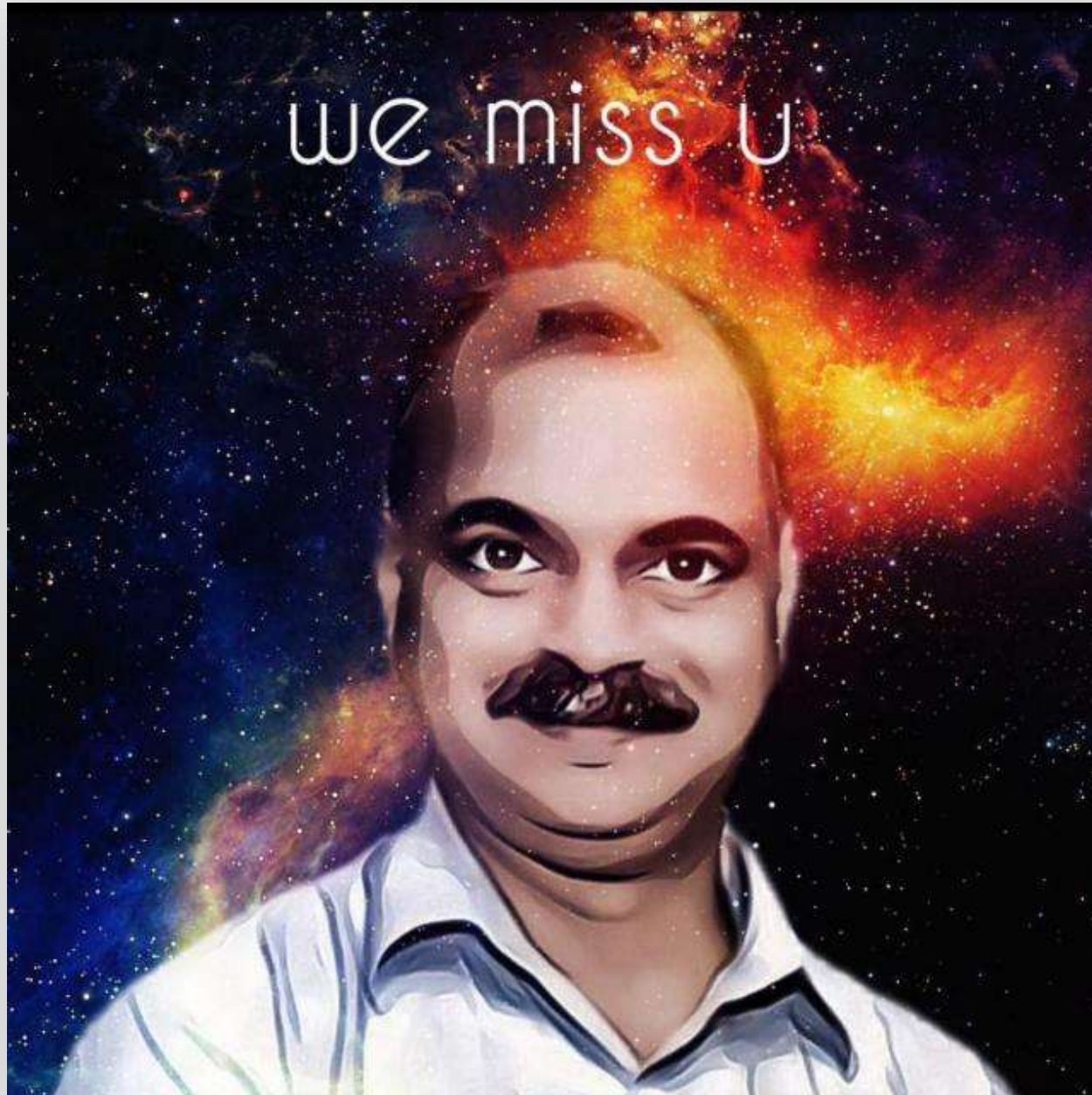
Special Interest in

& Sexual medicine
androgynaecare



**IASMP WAS BORN ON THURSDAY 8TH SEP 2016.
WHATSAPP GROUP, STARTED BY DR AJAYAN & DR RADHAKRISHNAN**





The flame
has gone, but
the light still
lingers on.

Purpose of Our Association:

Formed to support modern medicine doctors practicing sexual medicine.

Equip modern medicine doctors with the latest updates and training in sexual medicine.

Train everyone to be a

PRIMARY CARE
SEXOLOGIST



INTERNATIONAL
ASSOCIATION OF
SEXUAL
MEDICINE
PRACTITIONERS OF
MODERN
MEDICINE

OUR
RESPONSIBILITIES AS
A PRIMARY CARE
SEXOLOGIST

**WE ARE MEMBERS OF DIFFERENT
SPECIALTIES.**

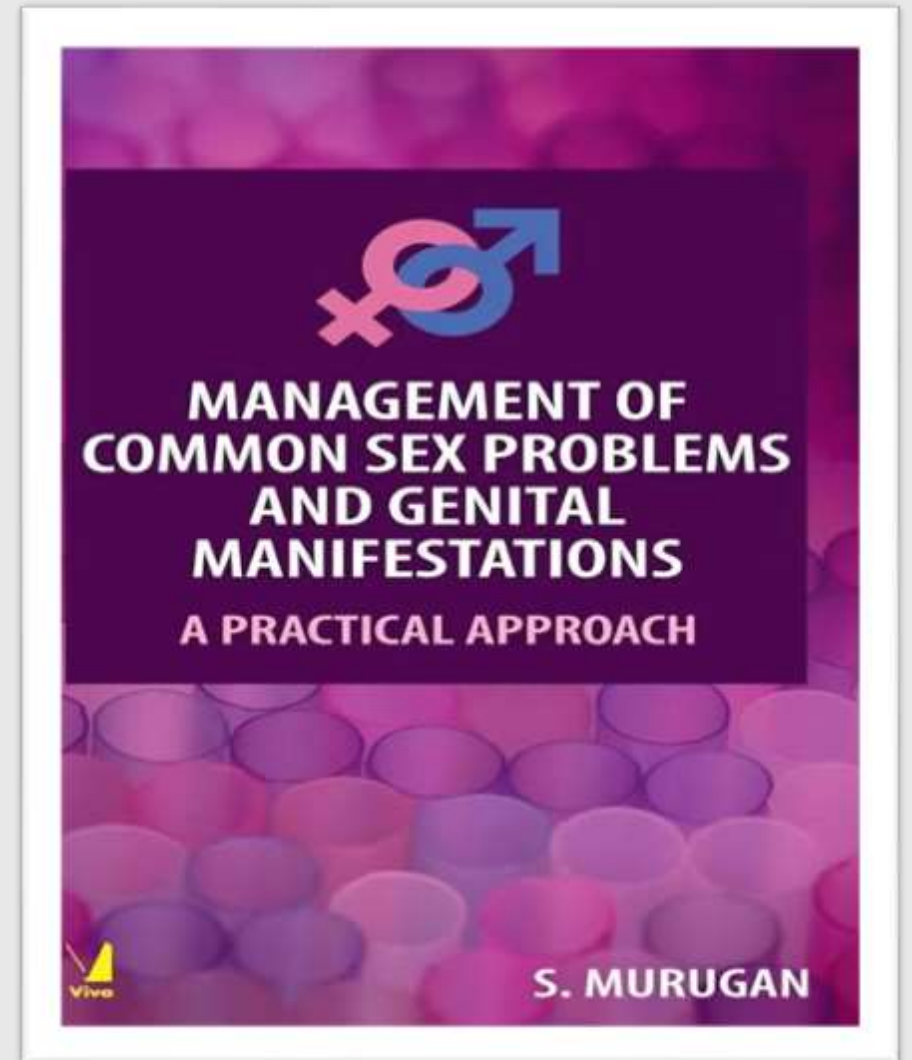
1. Identify Issues:

2. Treat with our Expertise: Provide appropriate treatment within our specialties and EXPERTISE IN SEXUAL MEDICINE

3. Refer When Needed: Refer patients to relevant specialists for advanced care

But I am a Gynaecologist / Physician / Psychiatrist....





I am a Gynaecologist / Physician / Psychiatrist....



Am IASMP member & a primary care sexologist...

AM IASMP MEMBER & A PRIMARY
CARE SEXOLOGIST



PRECEPTS OR WORKING PRINCIPLES FOR IASMP MEMBERS

Recognize Your Limits

Acknowledge when a case requires expertise beyond sexual medicine.

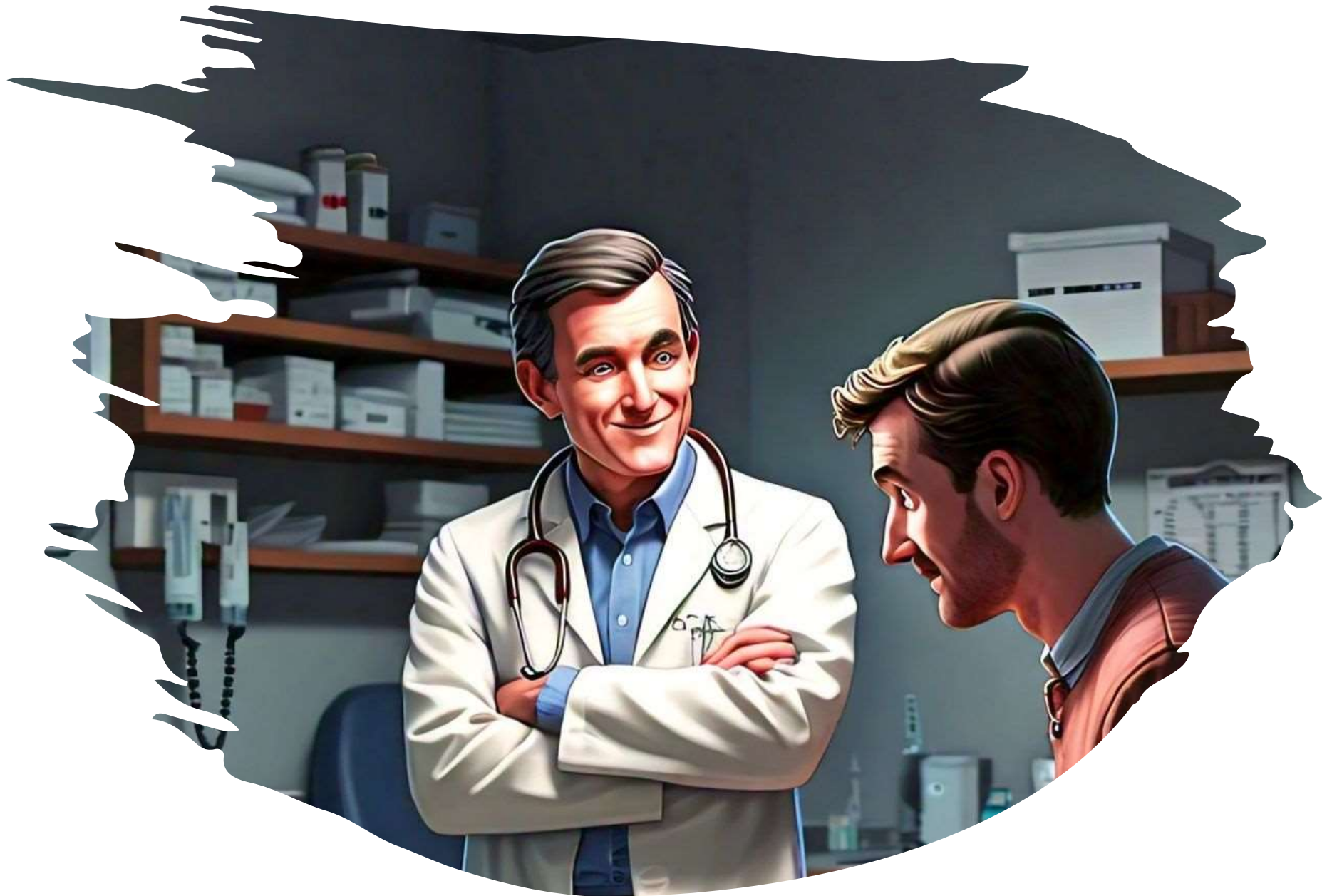
Refer to Specialists

Avoid potential legal issues.

Ensure timely referrals to the appropriate specialists to provide the best care.

"By not referring patients to experts when our treatments are ineffective, aren't we compromising our professionalism and risking similar outcomes to those of unqualified practitioners?"





Two things define u
1-Your patience when u
have nothing
2-Your attitude when u
have everything.....





Age : 38 Years / MALE IP/ DOB No. : Reported : 21/06/2024
Referred By Dr. : S RAJEEV Nationality : INDIAN Report Status: FINAL
Client Name : NA
Sample Collected At: CH [REDACTED] Sample Processed At : MEDIVISION-COCHIN

Department Of Clinical Pathology

Total Motility(PM+NP)	:	L	10	%	more than 40
Progressive Motile(PM)	:	L	05	%	more than 29
Non progressive Motile(NP)	:	H	05	%	0 - 1
Immotile Sperms	:	H	90	%	less than 20
Normal forms	:		93	%	more than 4
Pus cells	:		10-12/HPF		Nil
RBC	:		1-2/HPF		Nil

ABNORMAL FORMS : Giant head : 03%
Pin head : 02%
Swallow neck : 02%

Age : 38 Years / MALE IP/ DOB No. : Reported : 21/06/2024 1
Referred By Dr. : Nationality : INDIAN Report Status: FINAL
Client Name : NA
Sample Collected At: Sample Processed At :

Department Of Clinical Pathology

SEMEN DETAILED ANALYSIS

INVESTIGATION	OBSERVED VALUE	UNITS	REFERENCE RANGE
Time of collection	:	8.55 am	
Time of liquifaction	:	Within 1 hour	Within 30 minutes
Volume	:	2.4 mL	>=1.3
Colour	:	Opaque Grey	
pH	:	8.0	>=7.2
Viscosity	:	Normal	
Dropping test	:	Freely Dropping	
Sperm Count	:	L 13.00	Millions/mL >15
Total Sperm Number	:	L 31.20	millions/Ejacu > 35
Fructose	:	322	mg/dL >150
Spectrophotometry			
SPERM VITALITY			
Live	:	L 15	% more than / = 50
Dead	:	85	%

MOTILITY.





- These numbers are defined by the **WORLD HEALTH ORGANISATION (WHO)** and having a low parameter doesn't mean it's impossible to get a partner pregnant. Rather, it means that there may be a higher likelihood of fertility issues.

<u>2010</u> <u>5th edition</u>			<u>2021</u> <u>6th edition</u>	
Reference ranges are provided using 5th centiles based on:			Reference ranges and 5th centiles are insufficient to diagnose infertility; 5th centiles are based on:	
Multicenter studies with retrospective data analysis			Integration of the 2010 data and reanalysis with data published in the last decade	
1953 men with TTP $\leq$ 12 months		Cooper et al.	3589 men with TTP $\leq$ 12 months	
8 countries, 4 continents (Oceania, Americas, Europe)		Cooper et al.	13 countries, 6 continents (Asia, Americas, Europe, Africa, Oceania)	Campbell et al.

WHO 2010 (5th Edition) and WHO 2021 (6th Edition).

Lower fifth percentile of semen parameters from men, in couples starting a pregnancy within one year of unprotected sexual intercourse leading to a natural conception.

Parameter 6th ed WHO Lower reference limit	6th ed 5th centile data (95% CI)	5th ed 5th centile data (95% CI)
Semen volume	> 1.4 ml	>1.5 ml
Semen conc x 10 ⁶ /ml	≥ 16 million	≥15 million
Total sperm no. x 10 ⁶ /ejac	≥ 39 million	≥ 39 million
TM (PR+NP) %	≥ 42 %	≥ 40%
PR%	≥ 30 %	≥ 32%
NP%	1 %	1 %
IM%	20 %	22 %
Vitality %	≥ 54 %	≥ 58%
Normal forms %	≥ 4.0%	≥ 4%
Leucocytes	1 - 2 x 10 ⁶ /ml	1 x 10 ⁶ /ml

5TH PERCENTILE VALUE

The 5th percentile reference values in semen analysis by WHO guidelines provide a benchmark for evaluating male fertility. These values are derived from a large population of fertile men, and the 5th percentile is the value below which only 5% of the fertile men fall. Therefore, these values represent the lower limit of normal semen characteristics in fertile men.

Why Use the 5th Percentile?

The rationale behind using the 5th percentile is to establish a cut-off point that reflects the **minimum sperm concentration, motility, or morphology** associated with a high probability of natural fertility. Men with values below this threshold might have lower fertility potential.

Additional points to consider:

The 2021 WHO guidelines acknowledge limitations of using the 5th percentile as the sole criterion for normal semen analysis. Factors like ethnicity and geographic location can introduce some variability.

A semen analysis result below the 5th percentile value doesn't necessarily indicate infertility

Table 8.3 Distribution of semen examination results from men in couples starting a pregnancy within one year of unprotected sexual intercourse leading to a natural conception. From Campbell et al. (5); fifth percentile given with variability (95% confidence interval)

		Centiles									
	N	2.5th	5th	(95% CI)	10th	25th	50th	75th	90th	95th	97.5th
Semen volume (ml)	3586	1.0	1.4	(1.3–1.5)	1.8	2.3	3.0	4.2	5.5	6.2	6.9
Sperm concentration (10 ⁶ per ml)	3587	11	16	(15–18)	22	36	66	110	166	208	254
Total sperm number (10 ⁶ per ejaculate)	3584	29	39	(35–40)	58	108	210	363	561	701	865
Total motility (PR + NP, %)	3488	35	42	(40–43)	47	55	64	73	83	90	92
Progressive motility (PR, %)	3389	24	30	(29–31)	36	45	55	63	71	77	81
Non-progressive motility (NP, %)	3387	1	1	(1–1)	2	4	8	15	26	32	38
Immotile spermatozoa (IM, %)	2800	15	20	(19–20)	23	30	37	45	53	58	65
Vitality (%)	1337	45	54	(50–56)	60	69	78	88	95	97	98
Normal forms (%)	3335	3	4	(3.9–4.0)	5	8	14	23	32	39	45

Cut-off reference values for semen characteristics as published in consecutive WHO manuals

Semen parameter	WHO 1980	WHO 1987	WHO 1992	WHO 1999	WHO 2010	WHO 2021
Volume (ml)	ND	≥ 2	≥ 2	≥ 2	1.5	1.4
Sperm concentration ($\times 10^6/\text{ml}$)	20-200	≥ 20	≥ 20	≥ 20	15	16
Total sperm number ($\times 10^6$)	ND	≥ 40	≥ 40	≥ 40	39	39
Total motility (%)	≥ 60	≥ 50	≥ 50	≥ 50	40	42
Progressive motility (%)	$\geq 2^3$	≥ 25	≥ 25 (grade a)	≥ 25 (grade a)	32 (a+b)	30
Vitality (%)	ND	≥ 50	≥ 75	≥ 75	58	54
Normal morphology (%)	80.5	≥ 50	≥ 30	{14}	4	4



[Life \(Basel\)](#). 2021 Dec; 11(12): 1368.

PMCID: PMC8706130

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PMID: [34947899](https://pubmed.ncbi.nlm.nih.gov/34947899/)

The Sixth Edition of the WHO Manual for Human Semen Analysis: A Critical Review and SWOT Analysis

[Florence Boitrelle](#),^{1,2} [Rupin Shah](#),³ [Ramadan Saleh](#),^{4,5} [Ralf Henkel](#),^{6,7,8,9} [Hussein Kandil](#),¹⁰ [Eric Chung](#),^{11,12} [Paraskevi Vogiatzi](#),¹³ [Armand Zini](#),¹⁴ [Mohamed Arafa](#),^{8,15,16} and [Ashok Agarwal](#)^{8,*}

Renata Walczak-Jedrzejska, Academic Editor, Małgorzata Piasecka, Academic Editor, and Jolanta Słowikowska-Hilczer, Academic Editor

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See letter "[Comment on Boitrelle et al. The Sixth Edition of the WHO Manual for Human Semen Analysis: A Critical Review and SWOT Analysis. Life 2021, 11, 1368](#)" in volume 12, 1044.

SEMEN VOLUME

Definition The total volume of ejaculate produced.

5th Percentile Value: 1.4 ml (1.3 to 1.5)

Importance: A lower semen volume other than collection errors or lack of proper abstinence might indicate issues with the seminal vesicles or other reproductive system parts.

In some cases, Retrograde ejaculation.

If the semen volume is low, a second analysis should be performed, ensuring any potential collection issues.

It can also affect the delivery of sperm into the female genital tract.

The semen volume naturally decreases with age.

Sperm Concentration

Concentration refers to the number of sperm per mL of semen and is sometimes called sperm count.

5th Percentile Value: 16 million sperm/ml

Importance: Sperm concentration is critical for fertility as it indicates sperm density in the semen. Lower values could suggest reduced sperm production.

TOTAL SPERM NUMBER

Definition: The total number of sperm in the entire ejaculate.

5th Percentile Value: 39 Million sperm per ejaculate

Importance: This measures the total sperm count and provides a comprehensive view of the sperm production capacity.

MOTILITY

Definition: The percentage of sperm that are moving.

The 6th Edition re-adopted the distinction of progressive motility in two categories (grades a and b).

Thus, the categorization of sperm motility has reverted to fast progressive, slow progressive, non-progressively motile, and immotile sperm(a,b,c,d respectively) as mentioned in the 4th edition 1999, which was not included in the 5th edition.

1. Progressive Motility (PR)

Definition: This includes sperm that are moving actively, in a straight line or in large circles, indicating that they are capable of forward movement.

Significance: Progressive motility is crucial for the sperm to travel through the female reproductive tract and reach the egg for natural conception.

2. Non-Progressive Motility (NP).

Definition: This includes sperm that are moving but not in a forward direction. They might be moving in small circles or just twitching in place.

Significance: While these sperm are moving, their lack of forward progression means they are less likely to reach and fertilize an egg.

3. Immotility (IM).

Definition: This includes sperm that are completely immobile and show no movement at all.

Significance: Immotile sperm are unable to reach and fertilize an egg.



Dr Radhakrishnan Nair

REFERENCE VALUES

The 2021 WHO guidelines provide specific reference values for these categories:

Progressive Motility (PR): 32% (5th percentile)

Total Motility (progressive + non-progressive) (PR + NP): 40% (5th percentile)

Total Motility: Includes all moving sperm, including those moving non-linearly.

Importance: Motility is crucial for the sperm's ability to navigate through the female reproductive tract to reach and fertilize the egg.

Poor motility can reduce fertility chances.

SPERM VIABILITY OR VITALITY

Definition: The percentage of live sperm in the sample.

5th Percentile Value: 54%

Importance: Vitality reflects the proportion of living sperm and is important for ensuring that enough viable sperm are present to potentially fertilize an egg.

In the 6th Edition, vitality testing is recommended when the total sperm motility is below 40%.

Principle.

A cell with intact cell membranes(viable cells) will not take up eosin Y and will not be stained. In contrast, a nonviable cell will have a damaged cell membrane that will take up the dye and be pink-red.



MORPHOLOGY

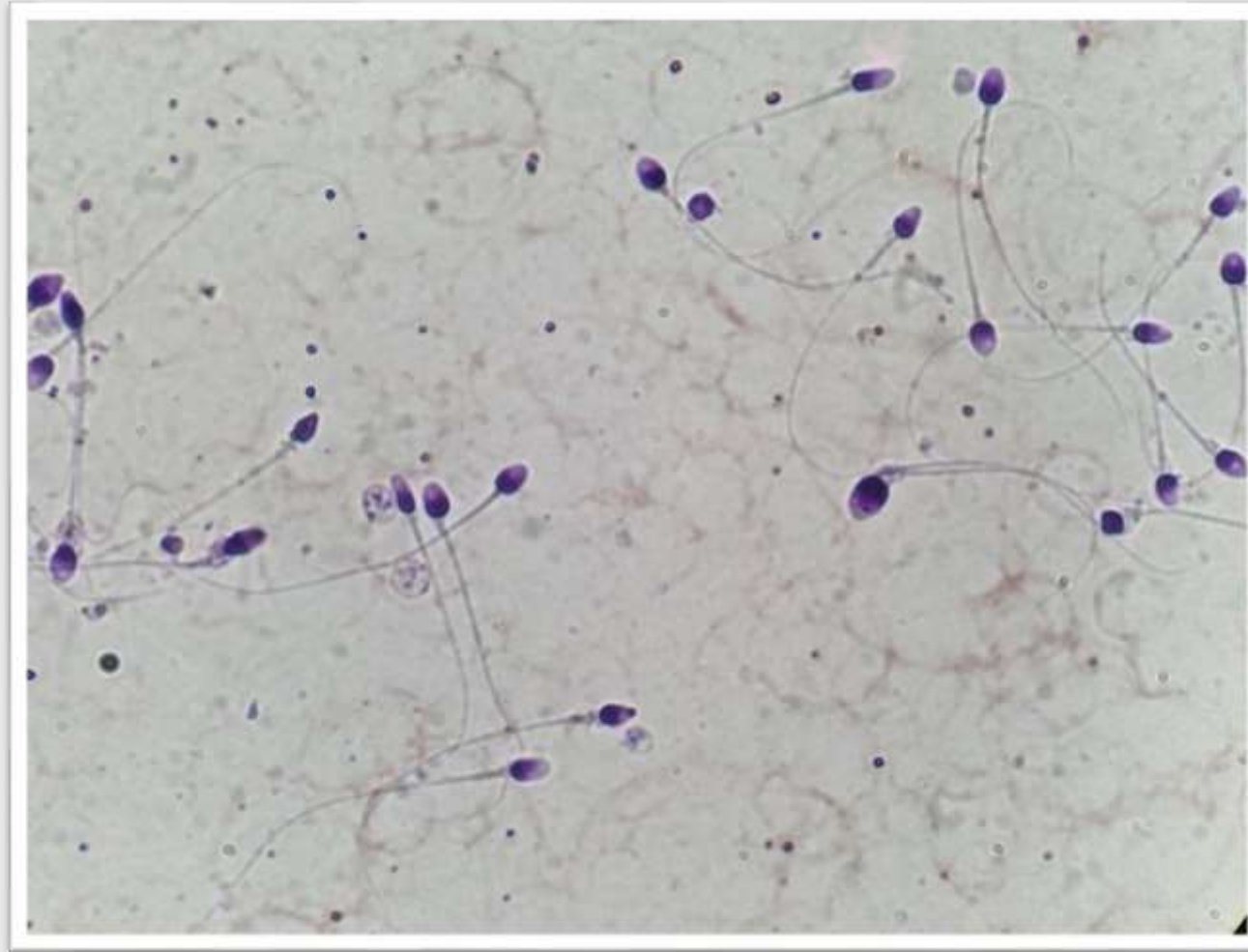
Definition: The percentage of sperm with a normal shape.

5th Percentile Value: 4%

Importance:

Sperm morphology is important because abnormally shaped sperm may have difficulty fertilizing an egg. A higher percentage of normal forms is typically associated with better fertility.

456 sperms lined up head to tail equals 1 inch



Department Of Clinical Pathology

SEMEN DETAILED ANALYSIS

<u>INVESTIGATION</u>		<u>OBSERVED VALUE</u>	<u>UNITS</u>	<u>REFERENCE RANGE</u>
Time of collection	:	11.35 am		
Time of liquifaction	:	Within 10 hours		Within 30 minutes
Volume	:	1.5	mL	>=1.3
Colour	:	Opaque Grey		
pH	:	7.9		>=7.2
Viscosity	:	High		
Dropping test	:	Delayed dropping		
Sperm Count	:	65.00	Millions/mL	>15
Total Sperm Number	:	97.50	millions/Ejacu	>35
Fructose	:	285	mg/dL	>150
<i>Spectrophotometry</i>				
SPERM VITALITY				
Live	:	L 45	%	more than/= 50
Dead	:	55	%	

MOTILITY.

Department Of Clinical Pathology

SEMEN DETAILED ANALYSIS

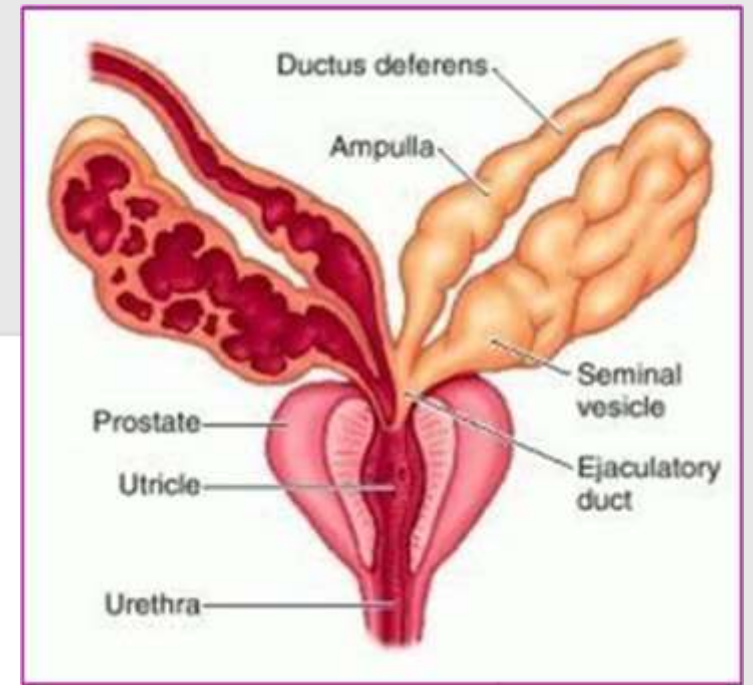
<u>INVESTIGATION</u>		<u>OBSERVED VALUE</u>	<u>UNITS</u>	<u>REFERENCE RANGE</u>
Time of collection	:	9.40 am		
Time of liquifaction	:	Within 3 hour		Within 30 minutes
Volume	:	2.0	mL	>=1.3
Colour	:	Opaque Grey		
pH	:	7.9		>=7.2
Viscosity	:	High		
Dropping test	:	Delayed dropping		
Sperm Count	:	115.00	Millions/mL	>15
Total Sperm Number	:	230.00	millions/Ejacu	>35
Fructose	:	360	mg/dL	>150
<i>Spectrophotometry</i>				
SPERM VITALITY				
Live	:	65	%	more than/= 50
Dead	:	35	%	

MOTILITY.

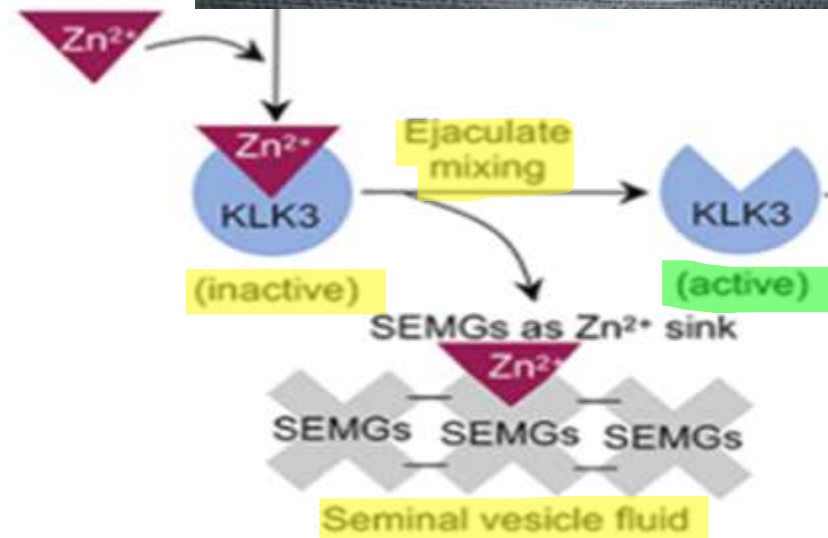
FLUID COMPONENTS OF SEMEN

SOURCE	% FLUID IN EJACULATE	CONTENT	FACTORS FOR LIQ
TESTIS EPIDIDYMIS	~ 10 %	SPERMATOZOA EPIDIDYMAL FLUID	
SEMINAL VESICLE	~ 65%	SEMINAL VESICLE FLUID	SEMGs & FIBRONECTIN
PROSTATE GLAND	~ 25%	PROSTATIC FLUID	KLK 3s & Zn
BULBOURETHRAL GLAND	~ 1%	BULBOURETHRAL FLUID	

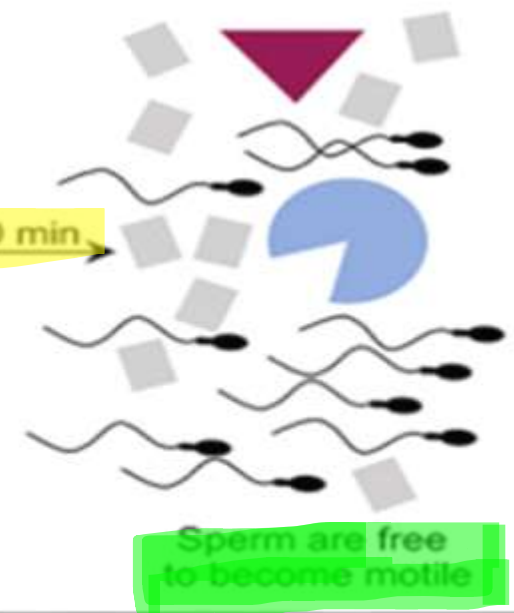
Immediately after ejaculation, SEMGs and fibronectin form a gel-like, cross-linked structure of SEMGs. This so-called coagulum hinders any spermatozoa movement and pre-activation (so-called capacitation). The prostate gland accumulates high levels of Zn in prostatic epithelial cells. A high concentration of Zn in prostatic fluid inactivates PSA



Prostatic fluid



Semen liquefaction



SEMEN LIQUEFACTION

PSA is mainly responsible for gel dissolution in freshly ejaculated semen by proteolysis of the major gel-forming proteins semenogelin I and II and fibronectin

In clinical settings, the liquefaction time is of diagnostic importance if more than 1 hour elapses without any change in the semen consistency.

As the liquefaction process takes place in the female reproductive tract, local production of KLKs, endogenous protease inhibitors, and **pathological conditions in the female tract** could also be contributing factors for liquefaction defects.

Any defects in the liquefaction process can lead to impaired semen liquefaction and ~12% of infertility patients have the symptoms of non-liquefied semen.

INCREASED VISCOSITY

The etiology of SHV has often been attributed to male accessory gland infection, increased levels of leukocytes, and inflammation.

The length of the thread formed by gently aspirating semen and allowing it to drop by gravity after 1 h incubation at room temperature.

SHV has a prevalence of 12–32% in men with fertility problems.

SHV negatively impacts semen quality and sperm motility because of the sperm-trapping effect of hyper-viscous semen.



Referred by	Dr. [REDACTED]	Bill date	11/7/2024
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IUI REPORT

PRE-PROCESSED REPORT

Reported on : 11/7/2024

Time of collection : 03:50PM

Abs days : 4 days

Volume : 2.0ml

Viscosity : +

Count : 11millions/ml

Total ejaculate : 22millions

Normal forms : 02% (poor)

Motility

Rapid – progressive : 00%

Slow – progressive : 31%

Non – Progressive : 08%

Immotile : 61%

Pus Cells : Numerous

POST-PROCESSED REPORT

Processing Method : Double density

Motile sperm count : 4millions/ml

Motility : 95% + 05%

Insemination Volume : 0.5 ml

Impression : Oligo-Asthen-Teratozoospermia and Pyospermia with Hyper

Viscosity : [REDACTED]

Jr. Embryologist sign _____ Doctor sign _____

Client Name : NA

Sample Collected At: CHITTETHUKARA-MEDIVISION

Sample Processed At : MEDIVISION-COCHIN

Department Of Clinical Pathology

Total Motility(PM+NP)	: L 10	%	more than 40
Progressive Motile(PM)	: L 05	%	more than 29
Non progressive Motile(NP)	: H 05	%	0 - 1
Immotile Sperms	: H 90	%	less than 20
Normal forms	: 93	%	more than 4
Pus cells	: 10-12/HPF		Nil
RBC	: 1-2/HPF		Nil

BNORMAL FORMS : Giant head : 03%

Pin head : 02%

Swallon neck : 02%

Reference : WHO laboratory manual for the examination and processing of human semen, 6th edition, 2021.

Pus cells, or white blood cells, are part of the body's defense mechanism against infections, and their presence in semen is a normal occurrence in low quantities.

However, an elevated count may signify an underlying issue.



ETIOLOGY

INFECTIOUS

Genital tract infections may affect the urethra, epididymis, testicles, or prostate. Infections of the urethra are generally due to sexually

transmitted organisms, most commonly due to *Chlamydia trachomatis*, *Ureaplasma urealyticum*, and *Neisseria gonorrhoea*.

Non-infectious causes or Inflammatory may include the following.

Toxins: environmental, tobacco, alcohol, or marijuana,

Varicocele

Autoimmune disorders

Chronic prostatitis

Congenital genitourinary malformations, such as posterior urethral valves.

Specific culture methods are required to identify genitourinary pathogens, which may exclude other organisms that are not easily detected using standard aerobic and anaerobic cultures.

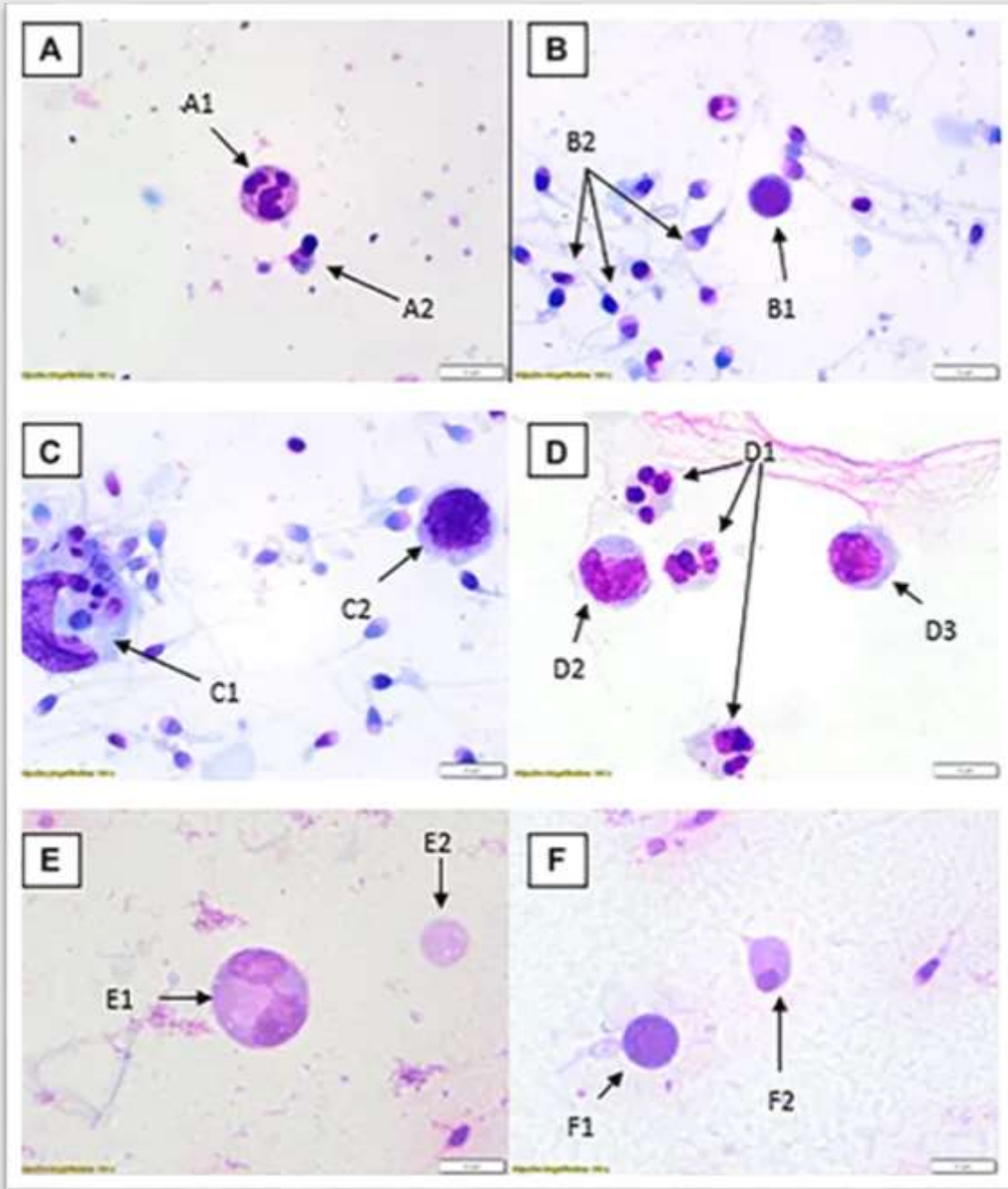
It is also possible that there are supportive bacteria in the semen that enhance sperm function and health, much like healthy vaginal flora.

VARICOCELE

Varicocele may be associated with leukocytospermia. varicocele patients had significantly higher numbers of CD4+ helper T lymphocytes, which may be due to the inflammation associated with varicocele. They also had a significantly higher mean platelet volume (MPV), a suspected marker for inflammation, when compared to control patients who did not have varicocele

SMOKING

In cigarette smokers, the presence of inhaled radioactive particles has been identified in the testes, which may lead to damage and inflammation, creating an increased leukocyte response. Tobacco metabolites trigger inflammatory responses and stimulate the infiltration of leukocytes into seminal plasma. When examining the ejaculate from smokers and comparing them to those of non-smokers, it was seen that there was a greater percentage of leukocytospermic ejaculates and a higher level of round cells in smokers.



Round cells are largely categorized as inflammatory or noninflammatory.

Inflammatory cells include polymorphonuclear leukocytes, lymphocytes, and macrophages.

Noninflammatory cells may include immature germ cells, epithelial cells, or degenerated spermatozoa.

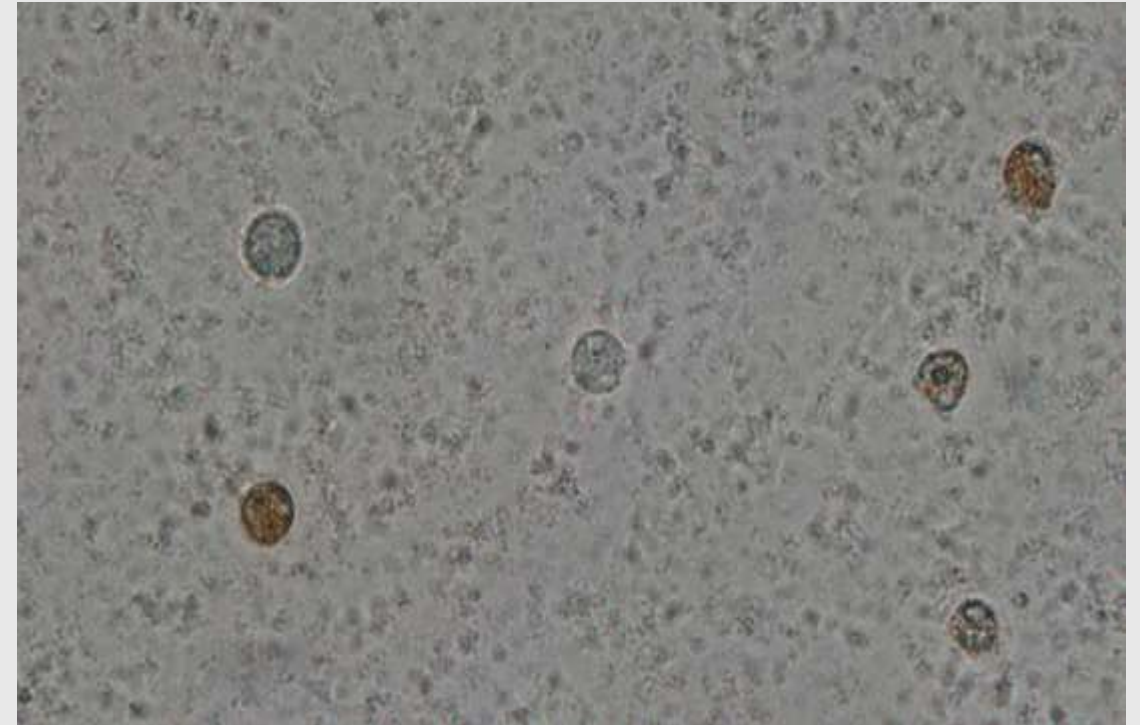
(A) Neutrophil (A1), spermatid (A2). **(B)** Possible lymphocyte (B1), multiple spermatozoa (B2). **(C)** Large phagocytic macrophage with engulfed material (C1), lymphocyte (C2). **(D)** Three neutrophils (D1), two monocytes (D2, D3). **(E)** Dividing spermatocyte (E1), cytoplasmic remnant (E2). **(F)** Possible lymphocyte (F1), spermatid (F2)

Pyospermia (leukocytospermia) is suspected based on the presence of > 1 million wbc's/ml of ejaculate and diagnosed using peroxidase stain (sensitivity 45 to 60).

In immunohistochemical staining for leukocyte surface antigens (sensitivity of more than 90%), only 35% were found to have true pyospermia.

Different stains and methods may be used for semen analysis to differentiate between the inflammatory and noninflammatory cells:

WBCs in the semen may be a marker of inflammation rather than a sign of an underlying bacterial or viral infection, as previously noted



The differentiation is done by the peroxidase method, that stains the white blood cells brown whereas the immature germ cells remain white

WHAT NEXT

If pus cells are in semen, treatment is only required if any symptoms.

Ask for these symptoms.

1. Burning pain while passing urine.
2. Also, the presence of burning pain while ejaculating, or burning while passing urine after ejaculation.
3. Pus discharge from the organ.
4. Foul-smelling semen and the presence of blood in semen (hematospermia).



The WHO recommends strict hygiene procedures in their laboratory manual

Before masturbation, the patient should pass urine, wash his hands and penis thoroughly with soap, rinse the soap properly, dry hands and penis with a clean, preferably disposable towel, and then ejaculate into a sterile wide-mouthed dry plastic container. The patients' instructions should include information that the container must only be opened just before masturbation and not be touched inside.

Strict hygienic procedures for the semen collection have been reported to decrease the bacterial load.

Kim and Goldstein and Rodin et al. even recommended the disinfection of the penile skin, scrotum, buttocks, perianal area, and hands with an antibacterial preparation containing 4% chlorhexidine gluconate and 10% povidone-iodine.

Standard semen culture only investigates aerobic pathogens, and little is known about anaerobic.

However, anaerobic bacteria, of which about 71% are potentially pathogenic, are also found in human ejaculates

Attempt to address underlying causes and reduce damage caused by ROS, by avoiding the use of substances, such as cigarette smoking marijuana, and alcohol.

Check for varicocele.

Both partners must be tested and treated, as many of these pathogens are sexually transmitted. The type of treatment also depends on the location of the infection. While cystitis treatment with Trimethoprim-Sulphamethoxazole or sometimes fluoroquinolones is recommended,

For epididymo-orchitis, intramuscular Ceftriaxone and the oral administration of Doxycycline are commonly recommended.

For non-gonococci bacteria and Chlamydia sp., Ofloxacin or Doxycycline can be prescribed.

Since the treatment of acute and chronic prostatitis is problematic because only a few antibiotics penetrate the prostate and its secretions, modern regimens with fluoroquinolones have been recommended

OTHER MEDICATIONS

Antioxidant therapy includes vitamin E, coenzyme Q10, and N-acetyl-L-cysteine. Studies using these substances have shown significantly reduced ROSs in leukocytospermia samples and possible improvement in the function of impaired spermatocytes. Additional research into the use of known antioxidant, Quercetin, has shown the further potential benefits that antioxidant therapy may have for leukocytospermia patients.

The above-mentioned combination with or without frequent ejaculation (at least every 3 days)

Antihistamines,(Uncontrolled clinical trial Ketotifen 1 mg PO BID for 12 weeks, Significant reduction in leukocyte concentration by 4 weeks).

Corticosteroids. and non-steroidal anti-inflammatories (NSAIDs).

THE BOTTOM LINE

A normal semen analysis isn't a guarantee that there won't be any issues with conception.

The clinical definition of infertility is not achieving a pregnancy after 12 months of unprotected sex if the female partner is <35 and 6 months if the partner is 35 or older.

If one or more of the semen analysis results are abnormal, the current standard of care is to perform a second test, to account for natural variability.

If the first test was done with a home-collected sample, consider performing the repeat analysis in a lab where it can be analyzed promptly.

KAUN BANEGA CROREPATHI ?

So, Kaun Banega Crorepathi...

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Semen volume	> 1.4 ml	>1.5 ml
Semen conc x 10 ⁶ /ml	≥ 16 million	≥15 million
Total sperm no. x 10 ⁶ /ejac	≥ 39 million	≥ 39 million
TM (PR+NP) %	≥ 42 %	≥ 40%
PR%	≥ 30 %	≥ 32%
NP%	1 %	1 %
IM%	20 %	22 %
Vitality %	≥ 54 %	≥ 58%
Normal forms %	≥ 4.0%	≥ 4%
Leucocytes	1 - 2 x 10 ⁶ /ml	1 x 10 ⁶ /ml

