# Semen Analysis

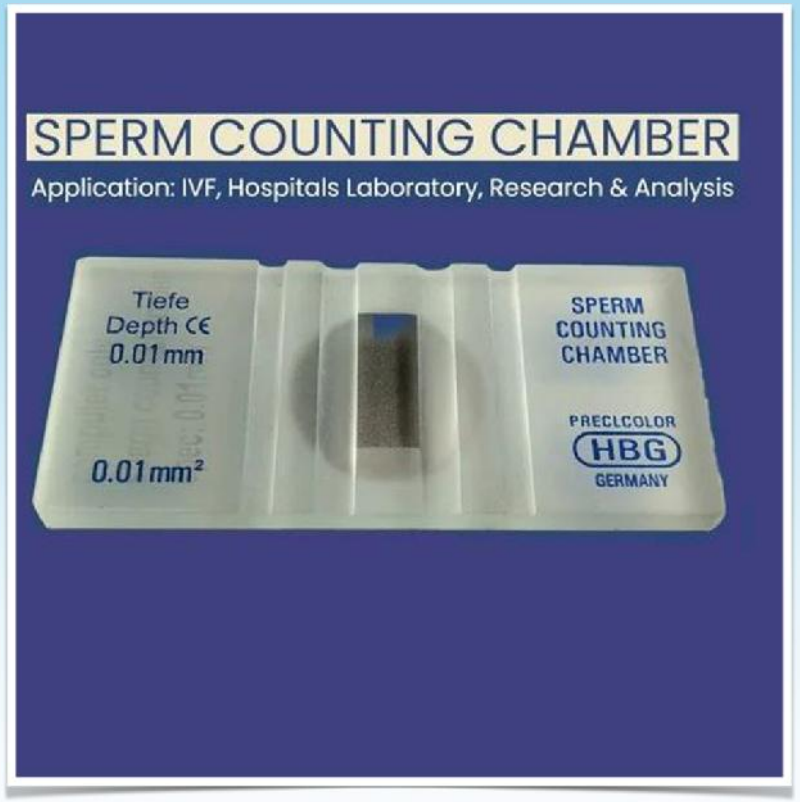
Dr. Mohsen Jalali

# Biological Variation

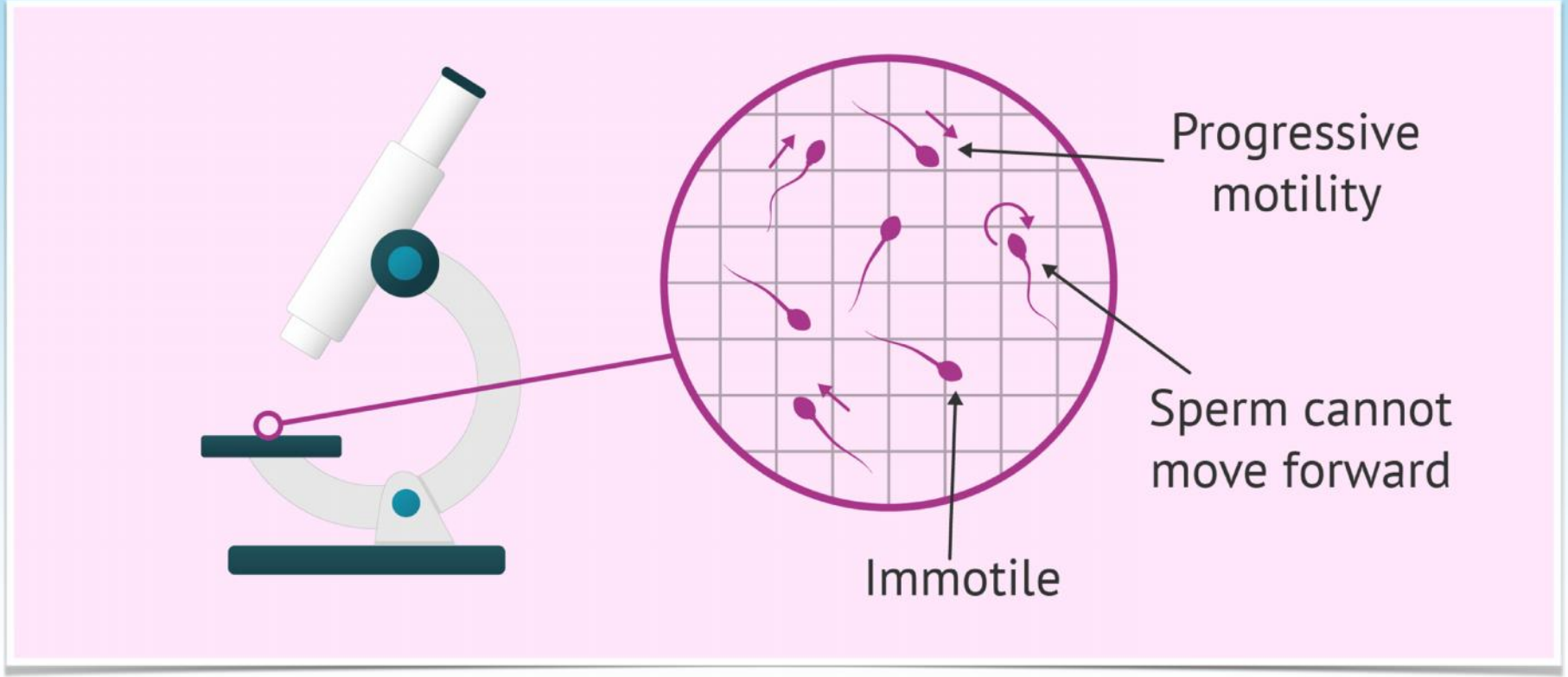
# Technical Error

# Specimen Collection

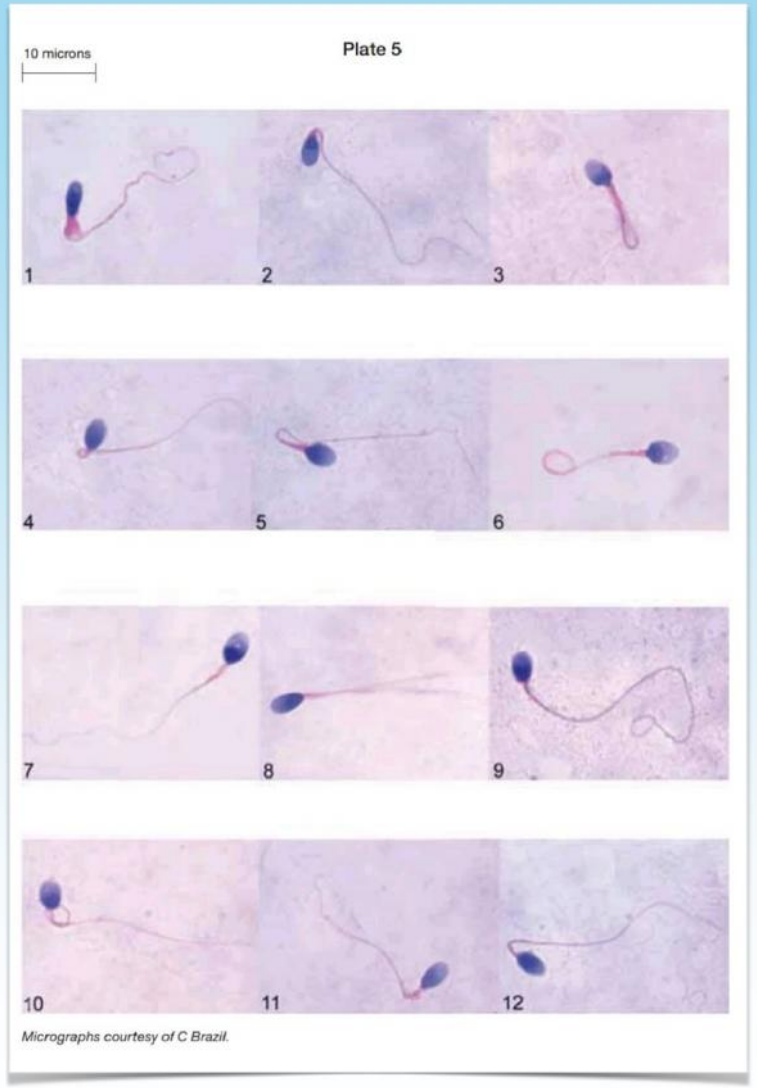
# Concentration



# Active Motility



# Normal Morphology



# WHO reference values changed

| | 1980 | 1987 | 1992 | 1999 | 2010 |
|---|---|---|---|---|---|
| Volume (mL) | ND | ≥2 | ≥2 | ≥2 | ≥1.5 |
| Count ($10^6$/mL) | 20-200 | ≥20 | ≥20 | ≥20 | ≥15 |
| Total count ($10^6$) | ND | ≥40 | ≥40 | ≥40 | ≥39 |
| Motility (%) | ≥ 60 | ≥50 | ≥50 | ≥50 | ≥40 |
| Progressive (%) | ≥ 2 | ≥25% | ≥25% (a) | ≥25% (a) | ≥32% |
| Vitality (%) | ND | ≥50 | ≥75 | ≥75 | ≥58 |
| Morphology (%) | 80.5 | ≥50 | ≥30 | (14)* | ≥4* |
| Leukocytes ($10^6$/mL) | <4.7 | <1.0 | <1.0 | <1.0 | 1.0 |

*Strict criteria (Tygerberg); Esteves et al. *Urology* 2012

ANDROFERT

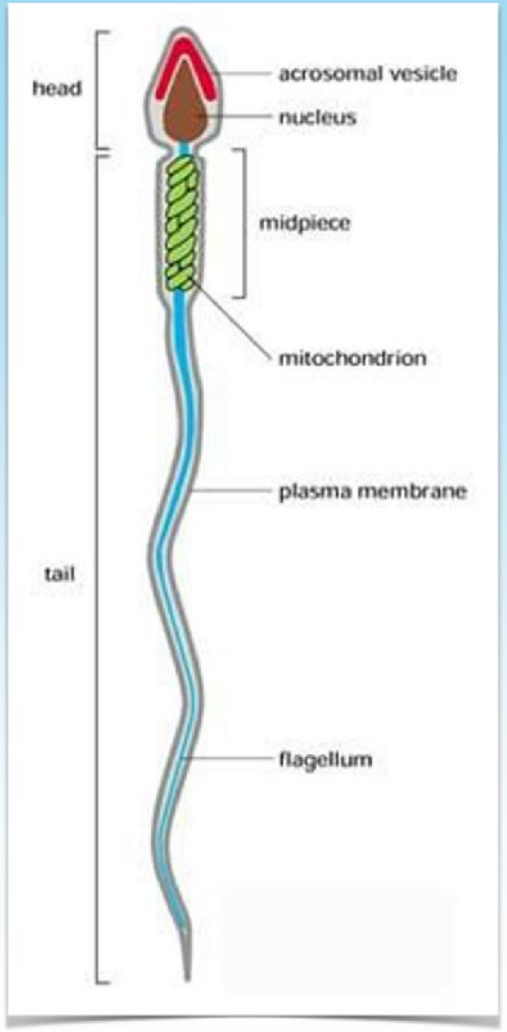
ANDROLOGY AND HUMAN REPRODUCTION CLINIC - REFERRAL CENTER FOR MALE REPRODUCTION

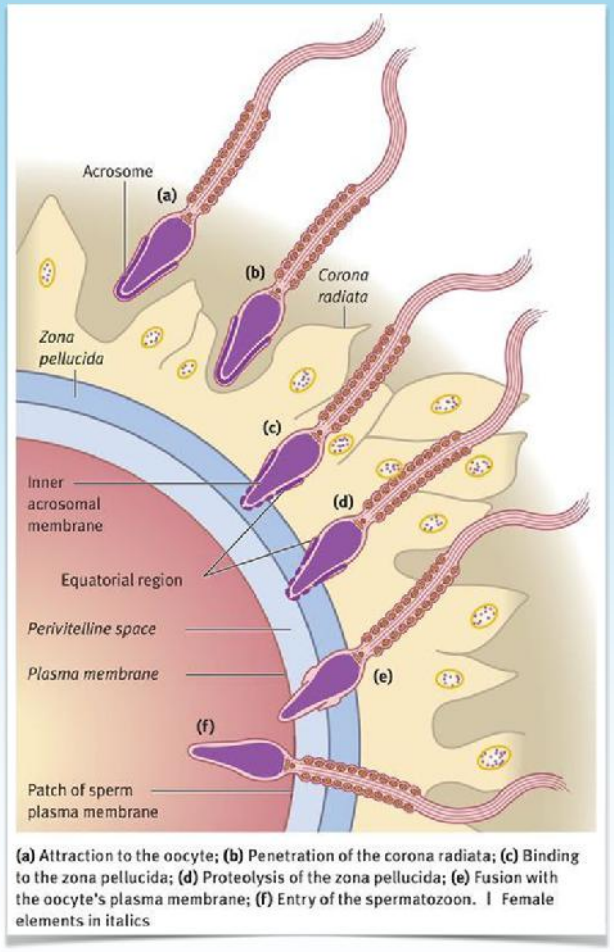
95

50

Shorts

# 1


head
acrosomal vesicle
nucleus
midpiece
mitochondrion
plasma membrane
tail
flagellum




**(a)** Attraction to the oocyte; **(b)** Penetration of the corona radiata; **(c)** Binding to the zona pellucida; **(d)** Proteolysis of the zona pellucida; **(e)** Fusion with the oocyte's plasma membrane; **(f)** Entry of the spermatozoon. | Female elements in italics