

Title: Use of a sperm morphology assessment standardisation training tool improves the accuracy of novice sperm morphologists

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Supplementary materials

Table S1: Accuracy means (%) (n=22) for experiment 1 for each classification system; 25, 8, 5 and 2-categories

User	Accuracy means (%)			
	25 Categories	8 Categories	5 Categories	2 Categories
1	62.0	70.0	76.0	86.0
2	72.0	79.0	83.0	90.0
3	62.0	74.0	80.0	90.0
4	42.0	59.0	71.0	80.0
5	57.0	70.0	80.0	86.0
6	46.0	58.0	67.0	81.0
7	19.0	35.0	44.0	59.0
8	68.0	74.0	76.0	90.0
9	59.0	63.0	64.0	80.0

10	60.0	69.0	75.0	90.0
11	49.0	62.0	60.0	83.0
12	41.0	57.0	59.0	70.0
13	63.0	73.0	77.0	85.0
14	77.0	81.0	85.0	91.0
15	18.0	21.0	21.0	50.0
16	42.0	59.0	66.0	81.0
17	61.0	78.0	79.0	86.0
18	49.0	64.0	64.0	83.0
19	63.0	71.0	73.0	82.0
20	55.0	66.0	69.0	78.0
21	51.0	57.0	61.0	72.0
22	58.0	74.0	78.0	84.0

Table S2: Duration means (mm:ss.0) for each user (n=22) for experiment 1 using the 25-category classification system

User	Duration means (mm:ss.0)
1	00:08.3
2	00:10.6
3	00:11.0
4	00:07.8
5	00:06.1
6	00:16.5
7	00:07.3

8	00:10.5
9	00:08.5
10	00:11.6
11	00:08.4
12	00:14.7
13	00:08.2
14	00:09.4
15	00:03.6
16	00:12.2
17	00:14.1
18	00:05.6
19	00:06.0
20	00:04.8
21	00:16.4
22	00:06.7

Table S3: Accuracy means (%) (n=16) per test (1-14) for each classification system; 25, 8, 5, and 2-categories for experiment 2

Test	Accuracy means (%)			
	25 Categories	8 Categories	5 Categories	2 Categories
1	82.7	90.0	92.9	94.9
2	81.8	89.8	92.9	94.6
3	80.9	88.3	91.6	93.4
4	82.7	90.3	93.4	95.4
5	89.1	94.7	96.6	97.4

6	88.4	95.2	96.4	97.1
7	89.4	95.6	97.3	97.8
8	84.0	95.1	95.1	92.5
9	90.8	96.9	97.7	98.1
10	90.7	96.3	97.4	97.7
11	91.3	96.6	97.5	98.1
12	90.4	96.3	97.4	97.6
13	90.6	96.3	96.9	97.6
14	90.6	95.9	97.0	97.8

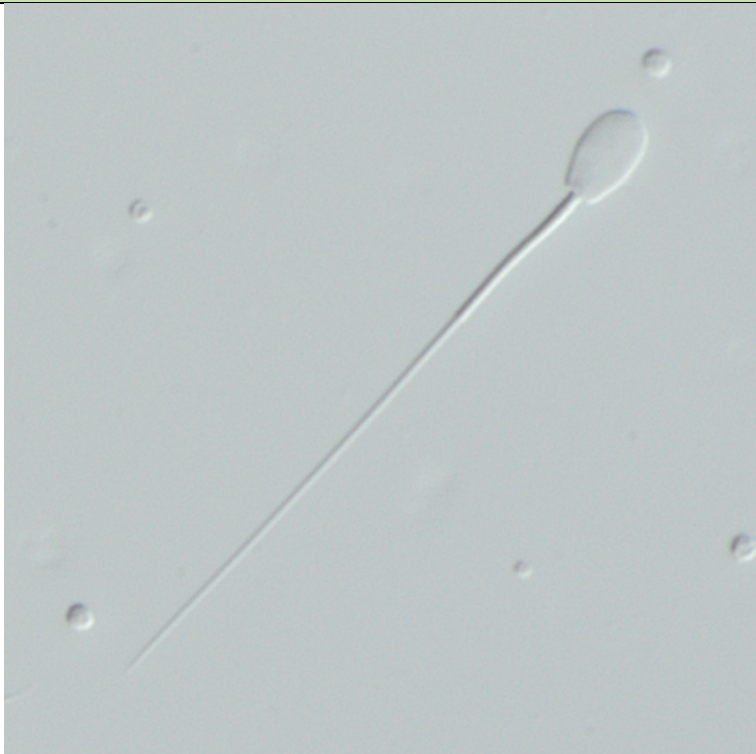
Table S4: Duration means (mm:ss.0) (n=16) for each test (1-14) using the 25-catego

ry classification system for experiment 2

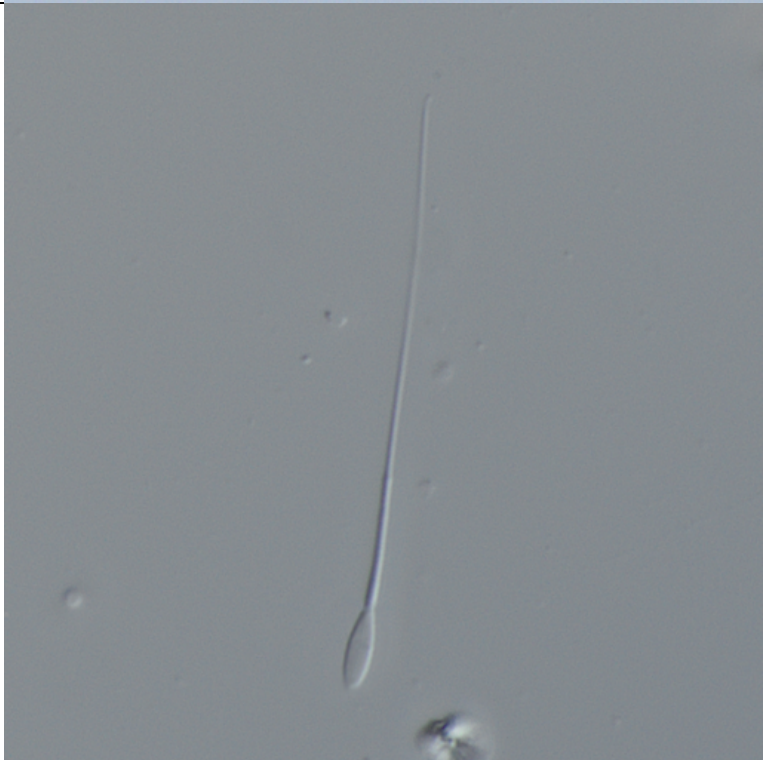
Test	Duration means (mm:ss.0)
1	00:07.0
2	00:07.4
3	00:08.0
4	00:07.9
5	00:05.3
6	00:05.8
7	00:04.8
8	00:05.0
9	00:05.5
10	00:05.5
11	00:05.2
12	00:05.3

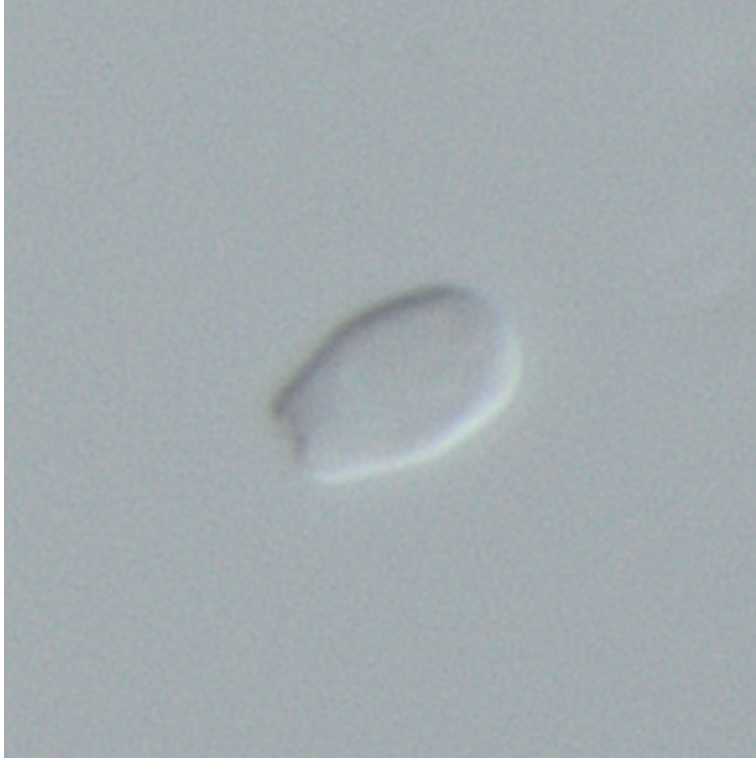
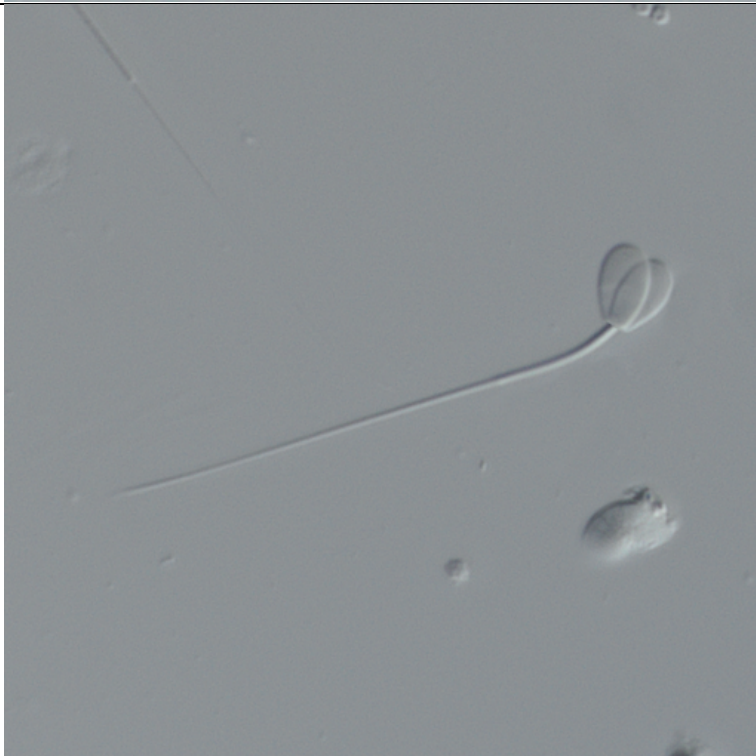
13	00:05.4
14	00:04.9

Sperm Morphology Assessment Standardisation Training Tool - Visual Aid

Morphological Characteristic	Image	Description
Normal + variations of normal		
Normal		A normal sperm has an even shape and consistent size, note the smooth head and acrosome, the lack of bends or breaks in the tail and the size.
Abaxial tail		The tail is not centred on the head, but rather attached slightly off centre

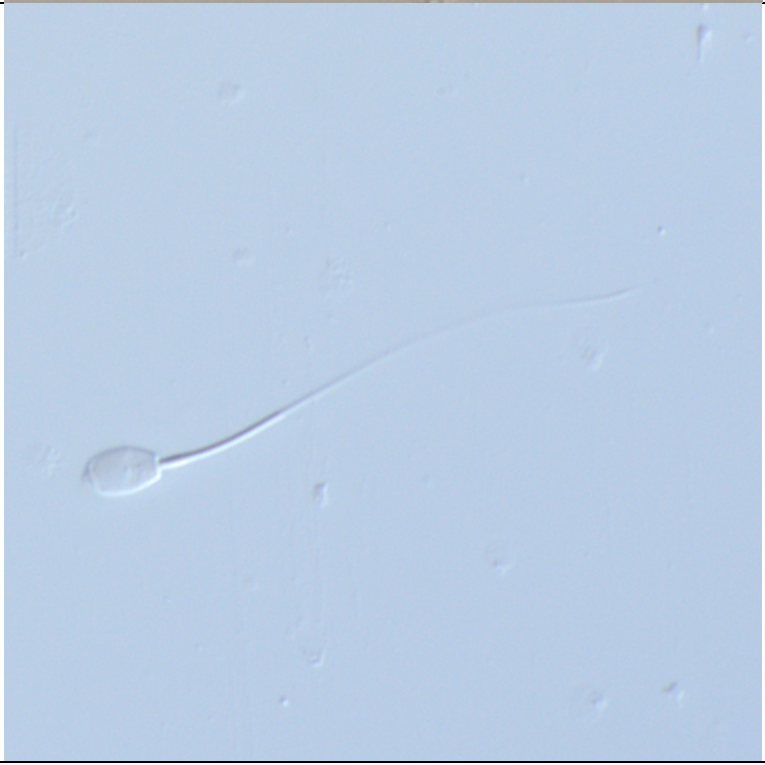
Segmental aplasia		The midpiece has a gap along its length or a slightly strange texture but not enough to be considered a cytoplasmic or pseudodrop let
Slightly pyriform head		Head has a slightly pear shape, near the midpiece the edge of the head tucks in slightly

More prominent apical ridge		The acrosome is sometimes more visible, seen as an apical ridge. It can be seen as an even, smooth ridge on the front of the head.
Narrow head		Sperm head is narrower by around $\frac{3}{4}$ of normal size but the length remain the same
Head		

Detached head	 A micrograph showing a single, detached sperm head. It is an oval-shaped structure with a clear, bright outline and a slightly granular internal texture, floating against a light gray background.	Head has been decapitated from the tail
Multiple heads	 A micrograph showing a sperm cell with multiple heads. A long, thin tail is visible, extending from a cluster of several oval-shaped heads. Other smaller, detached heads are visible in the background.	Sperm has more than one head

Pyriform head		The head is shaped like a teardrop and significantly tucks in at the base
Microcephalic head		The head is at least 25% smaller than normal

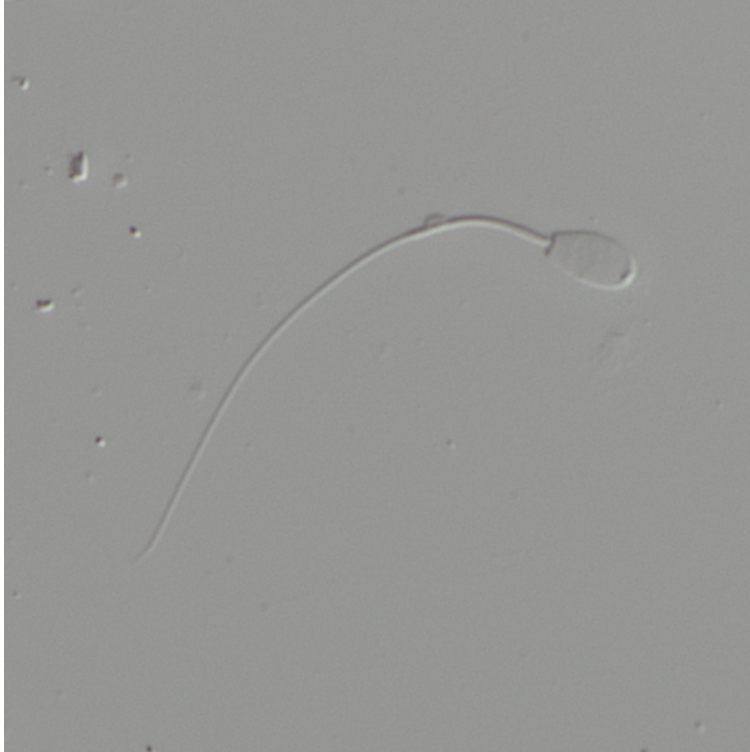
Macrocephalic head		The head is at least 25% larger than normal
Rolled head		The head has folded over itself partially or completely, often seen along the long axis of the head. The entire head must be in focus

Swollen acrosome		Acrosome can be distinguishe d as a 'halo' above the head
Knobbed acrosome		Acrosome is misshaped, this could mean it is indented, beaded or flattened.

Diadem defect		A line of dark dots along the width of the head, like a string of pearls
Nuclear vacuole		There is a dark crater on the sperm head

Teratoid		The head has been destroyed, leading to a textured surface and/or misshapen appearance
Missing acrosome		The acrosome is missing
Midpiece		

Broken neck		The head is bent almost perpendicular to the tail
Multiple midpieces		Distinguished by a lighter line down the middle of a thicker midpiece

Pseudodroplet		Thickening of the midpiece which appears almost as if it were a cytoplasmic droplet. It does not appear spherical, and is longer than a cytoplasmic droplet.
Dag defect		The midpiece is folded over onto itself multiple times

Corkscrew defect		The midpiece has bumps along its side as if it has been twisted
Tail		
Distal cytoplasmic droplet		A cytoplasmic droplet near the end of the tail

Proximal cytoplasmic droplet		A cytoplasmic droplet on the midpiece
Stumped tail		The tail is shorter (any length past the midpiece) than expected, take care that the tail is not just folded onto itself and only appears shorter

Multiple tails		The sperm has more than one tail
Reflex tail		The tail has folded over itself

Coiled tail		The tail has wrapped around itself making a coil
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