

Anti-Müllerian Hormone, AMH

Pseudonyms: Müllerian Inhibiting Substance, MIS. Müllerian Inhibiting Factor, MIF.

Most common use is in the investigation of infertility in adult females as a general indicator of ovarian reserve to give guidance for controlled ovarian stimulation in Assisted Reproduction Technology protocols (NICE guideline for fertility CG156). It can also be used to investigate polycystic ovary syndrome and granulosa cell cancer in adults. In paediatrics AMH measurement can be useful in the investigation of disorders of sexual development, particularly in distinguishing cryptorchidism from anorchidism and in persistent Müllerian duct syndrome, hypogonadotropic hypogonadism and as a marker of testicular function in Klinefelter syndrome (XXY). It may also be used in the pre- and post-assessment of girls and young women undergoing chemotherapy with gonadotoxic agents and in other causes of premature ovarian insufficiency (POI).

General information

Collection container:

Adults: 4.9mL Serum (Gel preferred) (Sarstedt brown top)/LiHep Plasma (Sarstedt orange top)

Paediatrics: 1.2mL Serum (Sarstedt white top)/LiHep Plasma (sarstedt orange top)

Type and volume of sample: Serum or Lithium Heparin. Minimum 1.0mL whole blood required for AMH alone (100uL plasma for neonates)

Specimen transport/special precautions: Internal – should be spun down within 2 hours of being taken. Once separated stable for 5 days at 4°C. Freeze at -20°C for medium term and -80°C for long term storage. Avoid use of pneumatic tube.

External – Process within 2 hrs then send 1st class post if get to lab within 2 – 3 days. If longer send frozen.

Laboratory information

Method principle: Roche Autoanalyser ECLIA (Electrochemiluminescent immunoassay) method (Elecsys AMH)

Biological reference range or cut off:

Adult Females

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Biochemistry

AMH < 2.6 pmol/L suggests a very low/undetectable ovarian reserve.

If patient undergoing IVF and AMH 2.6 to 17 pmol/L low ovarian reserve,

AMH 17.1 to 34 pmol/L satisfactory ovarian reserve

34.1 to 55 pmol/L optimal ovarian reserve

(All the above classifications to be considered in context with other fertility factors, both clinical and endocrinological). NB. Risk of OHSS in ART rises with rising AMH.

>55 pmol/L very high ovarian reserve/Polycystic ovarian disease – caution higher risk of ovarian hyperstimulation syndrome (OHSS)

If AMH very high >100 Suggestive of severe PCOS. Must also consider the possibility of a granulosa cell tumour.

Paediatrics

Female Paediatric AMH Reference Range	
Age Group	Female AMH (pmol/L)
0-28 d	≤ 6.7
29-364 d	≤ 31.2
1-4.99 y	1.3 – 43.7
5-7.99 y	1.4 – 39.5
8-11.99 y	2.9 – 52.8
12-14.99 y	3.0 – 46.6
15-17.99 y	2.1 – 84.1
Male Paediatric AMH Reference Range	
Age Group	Male AMH (pmol/L)
0-2 d	68.0 – 523.7
3-7 d	138.3 – 1023.7
8-10 d	195.2 - 1200.9
11-20 d	140.1 - 1130.9
21-28 d	212.0 - 951.4
29-364 d	203.8 – 971.7
1-4.99 y	268.6 – 1229.9
5-7.99 y	206.2 – 956.5
8-11.99 y	84.0 – 976.4
12-14.99 y	8.8 – 286.8
15-17.99 y	16.8-130.0

Turnaround times: Samples run in real time on autoanalyser. Expected turn round time (maximal):- Internal 2 days, External 1 week from receipt

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Clinical information

Factors known to significantly affect the results: Pre-analytical – Smoking, obesity and oral contraceptive pill known to reduce AMH levels in adult women.

Analytical - Prolonged time on cells thought to affect result but not proven with newer assays. Avoid gross haemolysis.

Clinical decision points: See ranges above for adult women.

Paediatric males: Presence of any AMH distinguishes cryptorchidism from anorchia.

(Last updated February 2021)