

## Human chorionic gonadotrophin; HCG

**Pseudonyms:** beat Human chorionic gonadotrophin;  $\beta$ HCG; Pregnancy Test; Germ-cell Tumour marker

### General information

#### Collection container (blood):

Adults – serum (with gel separator, 4.9mL Sarstedt brown top)

Paediatrics – lithium heparin plasma (1.2mL Sarstedt orange top tube)

#### Collection container (urine):

Adults – NOT AVAILABLE

Paediatrics – Point-of-Care Testing (POCT)

**Specimen transport/special precautions:** Urine pregnancy tests are performed as POCT tests across RMCH

### Laboratory information

**Method principle:** The Roche electrochemiluminescence immunoassay ECLIA combines a sandwich antigen-antibody reaction with two hCG-specific monoclonal mouse antibodies (biotinylated and ruthenium-labelled) on the surface of a magnetic microbead.

#### Biological reference ranges:

Blood:

Reported with the following comment:

“QUANTITATIVE HCG USED AS A PREGNANCY TEST: A result of >25 IU/L would normally indicate a positive test. But a result of <25IU/L does not exclude early pregnancy.”

Blood as a tumour marker:

<3 months up to 50 IU/L

>3 months female: up to 5 IU/L

>3 months male: up to 3 IU/L

Post-menopausal women: up to 8 IU/L

hCG, produced in the placenta, partially passes the placental barrier. Newborn serum beta hCG concentrations are approximately 1/400<sup>th</sup> of the corresponding maternal serum concentrations, resulting in

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### Biochemistry

neonate beta hCG levels of 10-50 IU/L at birth. Clearance half-life is approximately 2-3 days. Therefore, by 3 months of age, levels comparable to adults should be reached.

#### **Turnaround times:**

Blood: Urgent HCH results are available within 1 hour of receipt of the specimen in the laboratory. Otherwise results are typically available within four hours.

### Clinical information

In RMCH, pregnancy tests are routinely performed prior to invasive abdominal surgery or high dose radiological procedures for all females who have started their periods or who are older than 13 years of age.

The test is also used to help diagnose and monitor germ cell tumours.

#### **Factors known to significantly affect the results:**

A very low serum hCG does not exclude pregnancy. False negative results can occur in very early or abnormal pregnancy.

An ectopic pregnancy cannot be diagnosed using hCG alone. Levels should be repeated after 48h.

hCG can be produced by non-germ cell tumours (e.g. small cell carcinoma of the lung). Because of the existence of multiple forms of hCG and their varying detection by different assay formulations, it is important to be aware of the stated characteristics of the assay used. Assays for oncological use should ideally detect all forms of hCG.

The "high-dose hook effect" means that occasionally very high levels (>1 to 2 million IU/L) may return apparently much lower values (typically in the hundreds). A result that is unexpected or does not fit the clinical picture must be checked on dilution.

#### **Further information:**

General info on HCG <http://www.acb.org.uk/docs/default-source/amalc/hcg.pdf>  
RMCH pregnancy testing guideline is available on the intranet

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