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HUMAN CHORIONIC GONADOTROPHIN (hCG) INFORMATION SHEET

GENERAL

Human Chorionic Gonadotrophin (hCG) is a hormone secreted from the placenta into the maternal circulation with a role in the maintenance of a viable pregnancy. The serum concentration of hCG is used for the detection and monitoring of pregnancy and some malignant conditions.

NORMAL RANGES IN NON-PREGNANT PEOPLE

In normal women of child-bearing age the expected concentration of hCG in serum is less than 10 U/L, although usually it is less than 2 U/L. After menopause results up to 10 U/L are more common. hCG is less than 10 U/L in serum from males, and usually significantly lower.

DIAGNOSIS OF PREGNANCY

Using routine laboratory methods hCG is first detectable in the circulation 1 - 2 weeks after conception. This is equivalent to the first week after implantation or about 3 - 4 weeks after the last normal menstrual period. When using hCG tests to exclude pregnancy, a negative serum test (<10 U/L) taken after the first missed period, or for less sensitive tests such as are commonly used for urine testing a negative result one week after the first missed period is recommended for certainty. To be confident that a pregnancy is present a serum hCG concentration greater than 25 U/L is desirable. If a concentration between 10 and 25 U/L is obtained on a pregnancy test, then a further sample in 1 - 2 days is suggested for confirmation. For women before the first missed period, a negative result does not exclude very early pregnancy and repeat testing may be needed to exclude pregnancy.

hCG DURING PREGNANCY

During the first weeks of pregnancy serum concentrations rise rapidly with a doubling time of about 2 days. This rate of rise slows and the peak hCG concentration is reached between 8 and 12 weeks gestation. The concentration then falls to a plateau which persists over the second and third trimesters. After delivery hCG falls with a half life of 1 - 2 days. Expected values during pregnancy are very wide. This limits the use of hCG concentrations as a marker of the stage of pregnancy.

ABNORMAL hCG CONCENTRATIONS DURING PREGNANCY

High levels may be found in patients with twin or multiple pregnancies or with gestational trophoblastic disease. Low levels may be a marker of non-viable pregnancy, eg ectopic pregnancy. If the serum hCG concentrated takes more than 2 days to double in concentration during early pregnancy, this should arouse suspicions of either a possible ectopic pregnancy or a non-viable intrauterine pregnancy. **Gynaecological opinion should be sought in this instance.** hCG is usually detectable in ectopic pregnancies but this is not a universal finding.

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At hCG concentrations over 2500 U/L, a normal intra-uterine pregnancy should be visible on trans-vaginal ultrasound. Note that hCG levels should never be used in isolation for diagnosis of any of the above conditions.

CAUSES OF hCG ELEVATION OTHER THAN PREGNANCY

Elevated concentrations of hCG are a common finding in the serum of patients with trophoblastic or other germ cell tumours and can be a valuable marker for monitoring these conditions. Other malignancies which may also be associated with increased hCG include lung, breast, gastrointestinal and ovarian cancers although these are very uncommon causes of elevated hCG. Elevated serum hCG may also be found in some non-malignant disorders including inflammatory bowel disease, cirrhosis and duodenal ulcer. hCG has also been used as an anabolic agent in some sportspersons.

The molecular forms of hCG derived from malignancies may vary from those found in pregnancy and this can affect some assay systems. Therefore, the same method should be used to monitor a patient over time. If an elevated result is obtained which does not correspond with the clinical findings, please contact the laboratory for further investigation.

INTERPRETATION OF SYDPATH QUANTITATIVE SERUM hCG RESULTS

SERUM hCG (U/L) REFERENCE INTERVALS		
FEMALES	Pre-menopausal	<10 (often <2 U/L)
	Post-menopausal	<10
MALES		<10 (often <2 U/L)

PREGNANCY TEST RESULTS	
Serum hCG (U/L)	Interpretation
<10	Negative (if taken after first missed period)
10-25	borderline result (suggest repeat in 48 hours)
>25	Consistent with pregnancy

PREGNANCY STAGING		
Weeks since LMP	Approximate hCG range (U/L)	Comment
4th week	0-750	Week prior to first missed period
5th week	200-7,000	Week after first missed period
6th week	200-32,000	
7th week	3,000-160,000	
8-12 weeks	32,000-210,000	
13-16 weeks	9,000-210,000	
16-29 weeks	1,400-53,000	Second Trimester
29-41 weeks	940-60,000	Third Trimester