Investigation	Observed Value	Unit	Biological Reference Interval
Cancer Detection Profile, Female			
AFP-Alpha Feto Protein (Serum,CLIA)	1.28	IU/mL	0.56-2.64

Interpretation:

Pregnant Woman Post LMP (Week + Day)	Median (IU/ml)	Range (IU/ml)
14 + 3	21.73	18.2 to 45.5
15 + 3	25	21.1 to 52.7
16 + 3	28.75	24.5 to 61.0
17 + 3	33.08	28.3 to 70.7
18 + 3	38.05	32.8 to 81.9
19 + 3	43.78	37.9 to 95.0
20 + 3	50.36	40 to 100
21 + 3	57.93	45 to 120
22 + 3	66.11	52 to 138

1. The primary malignancies associated with AFP elevations are hepatocellular carcinoma and non-seminomatous germ cell tumors. Other gastrointestinal cancers like gastric, pancreatic occasionally cause elevations of AFP. Multiple benign disorders like cirrhosis, viral hepatitis, pregnancy are associated with AFP elevations. Level above which benign disease is considered unlikely is 500 ng/ml .
2. Range for newborns is not established, however neonates have elevated AFP levels (>100,000 ng/mL)(conversion 1 IU/ml x 1.21 = 1ng/ml) that rapidly fall to below 100 ng/mL by 150 days & gradually return to normal by one year. Ref - Tsuchida Y et al: Evaluation of alpha-fetoprotein in early infancy. J Ped Surg 1978 April;13(2):155-162 .

CA-15.3 (Serum,CMIA)	12.10	U/mL	00-31.3

INTERPRETATION-

- CA 15-3 is a mucin-like membrane glycoprotein.
- Increased levels are also noted in few cases of carcinomas of ovary, colon, pancreas, lung and non malignant conditions such as chronic hepatitis, cirrhosis, sarcoidosis and Systematic Lupus Erythematosus.
- Sensitivity for serum CA 15-3 in patients with early breast cancer is 15-35% & hence is not recommended for screening & thus low levels of CA 15-3 does not exclude the presence of either primary or metastatic breast cancer.
- In patients with breast cancer where the serum CA 15-3 level is elevated, the tumour marker can be used to monitor response to therapy. CA 15-3 has been shown to detect 40-60% of relapses before clinical or radiological evidence of disease with a lead-time of between 2 and 18 months.

Reference-

1. Clinical Practice Guidelines for Serum tumour markers, 2003
2. Laboratory Medicine Practice Guidelines for use of tumour markers, NACB, 2009

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Investigation	Observed Value	Unit	Biological Reference Interval
CA-125 (Serum,CMIA)	8.36	U/mL	0-35

Interpretation :

1. CA 125 is a glycoprotein normally expressed in coelomic epithelium, which lines body cavities and envelopes the ovaries.
2. CA 125 levels are elevated in about 85 percent of women with ovarian cancer (especially serous epithelial tumours), but in only 50 percent of those with stage I disease.
3. Multiple benign disorders like Menstruation, pregnancy, fibroids, ovarian cysts, pelvic inflammation, cirrhosis, ascites, pleural and pericardial effusions, endometriosis also are associated with CA 125 elevations.
4. Levels above which benign diseases are considered unlikely are 200U/ml in premenopausal & 35 u/ml for postmenopausal women.

Reference : Greg.L.Perkin. et.al. Serum Tumor Markers. American family physicians sep.2003 vol.68 no.6.

Associated Test : HE4 assay is a new test which also can be used for therapeutic monitoring as well as for risk stratification of harboring Epithelial Ovarian Cancer (ROMA value) in early stages.

CA-19.9 (Serum,CMIA)	3.12	U/mL	0-37

Interpretation :

1. CA 19.9 is an intracellular addition molecule and is seen elevated in pancreatic carcinoma, bile duct carcinomas, gastric carcinomas, colon carcinomas, esophageal carcinomas and hepatocellular carcinoma.
2. High CA 19.9 levels are seen in cirrhosis, acute cholangitis, cirrhosis, autoimmune conditions and inflammatory disease of the bowel, although values are usually less than 1000 U/mL.
3. CA 19.9 levels are also useful in predicting survival,residual disease, metastatis or recurrence after surgery.
4. Patients with Lewis-null blood type do not produce CA-19.9. Thus above 5% of persons are unable to produce this antigen

Reference: Greg.L.Perkin. et.al. Serum Tumor Markers. American family physicians sep.2003 vol.68 no.6

Calcitonin (Thyrocalcitonin) (Serum,CLIA)	Below 2	pg/mL	0-11.5

Interpretation :

1. Calcitonin levels are raised in medullary carcinoma of the thyroid, myeloproliferative disorders, hyperparathyroidism, renal failure and chronic inflammatory disease.
2. It can also be raised as part of the paraneoplastic syndrome associated with tumors of lung and breast.

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Investigation	Observed Value	Unit	Biological Reference Interval
CEA-Carcino Embryonic Antigen,Serum (Serum,CMIA)	0.77	ng/mL	Non-Smoking: 0-2.5 Smoking: 0-5

Interpretation :

1. CEA (Carcinoembryonic Antigen), is an oncofetal glycoprotein and is expressed in normal mucosal cells and over expressed in adenocarcinoma, especially colorectal cancer.
2. CEA is used as a marker for monitoring colorectal and gastrointestinal carcinoma and is raised in carcinoma of lung ,breast,liver,pancreas ,prostate ,stomach and ovary .
3. Benign conditions which can elevate CEA include smoking, hepatic diseases, infections, inflammatory bowel disease, trauma, collagen vascular disease, renal disorders, pancreatitis, cirrhosis of the liver and peptic ulcer, hypothyroidism, chemotheraphy and radiation. Although values are usually less than 10 ng/mL.
4. CEA is not an effective screening test for hidden (occult cancer since early tumors do not cause significant blood elevations .
5. A single test result is difficult to evaluate, but a number of tests, done weeks apart, shows trends in disease progression or regression .

Reference: Greg.L.Perkin. et.al. Serum Tumor Markers. American family physicians sep.2003 vol.68 no.6

Associated test : FDP DR-70 is a non-invasive blood test available for monitoring Colorectal Cancer therapy & assessing Post-therapy recurrence.

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Investigation	Observed Value	Unit	Biological Reference Interval
HCG Beta Subunit, Serum (Serum,CMIA)			
HCG Beta Subunit	Below 1.2	mIU/mL	Non pregnant: <= 5.3 Peri & Post menopausal: <= 13 Pregnant : Refer Interpretation

Pregnant Woman - Weeks of gestation(Gest.)	Weeks post Last Menstrual Period (LMP)	Range(mIU/ml)
1.3 to 2	3.3 to 4	16 to 156
2 to 3	4 to 5	101 to 4,870
3 to 4	5 to 6	1,110 to 31,500
4 to 5	6 to 7	2,560 to 82,300
5 to 6	7 to 8	23,100 to 1,51,000
6 to 7	8 to 9	27,300 to 2,33,000
7 to 11	9 to 13	20,900 to 2,91,000
11 to 16	13 to 18	6,140 to 1,03,000
16 to 21	18 to 23	4,720 to 80,100
21 to 39	23 to 41	2,700 to 78,100

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Investigation	Observed Value	Unit	Biological Reference Interval
Thyroglobulin (Serum,CLIA)	**71.20**	ng/mL	1.6-60

Medical Remarks: RECHECKED

Interpretation:

1 .Thyroglobulin levels are increased in papillary carcinoma of thyroid as well as metastatic disease.
2 .Thyroglobulin levels are physiologically raised in newborn babies ,in the third trimester of pregnancy, inall forms of hyperthyroidism except
factitious hyperthyroidism.
3 .Thyroglobulin levels should be done before administering I-131; or needling the thyroid as these procedures causetransient elevation of the
iodoglycoprotein; levels also stay raised for upto 6 weeks after initial therapy withradioisotopes or surgery.

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Ms. CYNTHIA KWASHIE PID NO: P36180004108 Age: 43 Year(s) Sex: Female	**Reference:** Sample Collected At: GILEAD MEDICAL & DENTAL CENTER HOUSE NO BALB NO C896/3,KANDA HIGHWAY NORTH RIDGE,ACCRA-14911. 014911	**VID: 36180104246** Registered On: 21/05/2018 05:38 PM Collected On: 21/05/2018 Reported On: 02/06/2018 06:42 PM

HPV DNA Detection

Test Principle : PCR - Sequencing

Specimen : Material In LBC Container

Result :

HPV DNA Detection	**NOT DETECTED**
HPV GENOTYPE	**--**

Result Interpretation:

- A "NOT DETECTED" result indicates the absence of HPV virus in the specimen.
- A "DETECTED" result indicates the presence of HPV virus in the specimen.
- All the result should always be correlated by clinical status and history of the patient.

Clinical Background:

- Molecular detection of HPV DNA is currently the gold standard for identification of HPV.
- The viral DNA is amplified in vitro by DNA polymerase to generate adequate amount of target, which is then directly visualized on the gel and sequenced to detect the specific genotype.
- The sensitivity of PCR based method is about 100 HPV viral genomes in a background of 100ng cellular DNA with a specificity of >98%. An internal control of 268bp is run for every sample to validate the assay.

Clinical Utility:

- Over 120 HPV types have been identified and over 30 types are transmitted sexually making HPV the most common sexually transmitted disease (STD).
- High-risk HPV includes 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58,59, 68, 69 of which type 16 and 18 cause about 70 percent of cervical cancers.
- However, the low-risk types which rarely develop into cancer include 6, 11, 40, 42, 43, 44, 53, 54, 61, 72, 73 and 81 of which type 6 and 11 are linked to about 90 percent of genital warts.
- HPV status and the genotype involved in infection have an important clinical significance.
- Persistent infection of specific types of high risk HPV is essential for progression of cervical lesions that are likely to develop cancer.

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Microbiologist
(MD,MICROBIOLOGY)

Limitation of the Assay:

- Presence of PCR inhibitors in the sample prevents DNA amplification for HPV detection.
- Unknown risk genotypes are identified by this assay.

Note:

This test has been developed and its performance validated at Molecular Biology Department, Metropolis Healthcare Ltd.

Reference:

- Husman et. al., 1995. Journal of General Virology, 76:1057-1062.
- Winder et. al., 2009. BMC Cancer, 9:440.

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PAP SMEAR EXAMINATION

Case Summary

CASE NO.	ML G - 6822/18
SPECIMEN	PAP SMEAR -LIQUID BASED CYTOLOGY
DIAGNOSIS	Negative For Intraepithelial Lesion or Malignancy (NILM)

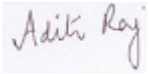
Clinical Notes	-
Gross Examination	Specimen received in preservCyt solution vial
MICROSCOPIC EXAMINATION	
Specimen Adequacy	satisfactory for evaluation;endocervical/transformation zone component present.
Superficial cells	Present
Intermediate cells	Present
Deep parabasal/ Basal cells	-
Parabasal cells	-
Metaplastic squamous cells	Present
Endocervical cells	-
Others	-
Inflammation	Moderate
ORGANISMS	
Doderlein bacilli	-
Trichomonas Vaginilis	-
Fungal organisms	-
Others	-
EPITHELIAL CELL ABNORMALITIES	Not Detected
GLANDULAR CELLS	-
SQUAMOUS CELLS	-

Note :
"Cervical cytology is a screening test and has associated false negative and false positive results. Regular sampling and follow up is recommended".

Processing Method : Manual. **Staining :** Papanicolaou method

Clinical Application :

1. The smears are reported using the Bethesda System for Reporting Cervical Cytology (2014)
2. New Cervical Cancer Screening Recommendations from the U.S. Preventive Services Task



Dr. Aditi Raj

Force and the American Cancer Society/American Society for Colposcopy and Cervical Pathology/American Society for Clinical Pathology. *March 15, 2012, issue of Annals of Internal Medicine*

Population	USPSTF	ACS/ASCCP/ASCP
Younger than 21 years	Recommends against screening. Grade: D recommendation.	Women should not be screened regardless of the age of sexual initiation or other risk factors.
21–29 years	Recommends screening with cytology every 3 years. Grade: A recommendation.	Screening with cytology alone every 3 years is recommended.
30–65 years	Recommends screening with cytology every 3 years or for women who want to lengthen the screening interval, screening with a combination of cytology and HPV testing every 5 years. Grade: A recommendation.	Screening with cytology and HPV testing (“co-testing”) every 5 years (preferred) or cytology alone every 3 years (acceptable) is recommended.
Older than 65 years	Recommends against screening women who have had adequate prior screening and are not otherwise at high risk for cervical cancer. Grade: D recommendation.	Women with evidence of adequate negative prior screening and no history of CIN2+ within the last 20 years should not be screened. Screening should not be resumed for any reason, even if a woman reports having a new sexual partner.
After hysterectomy	Recommends against screening in women who have had a hysterectomy with removal of the cervix and who do not have a history of a high-grade precancerous lesion (ie, CIN 2 or 3) or cervical cancer. Grade: D recommendation	Women of any age following a hysterectomy with removal of the cervix who have no history of CIN2+ should not be screened for vaginal cancer. Evidence of adequate negative prior screening is not required.

Aditi Raj

Dr. Aditi Raj

		Screening should not be resumed for any reason, including if a woman reports having a new sexual partner.
HPV vaccinated	Women who have been vaccinated should continue to be screened.	Recommended screening practices should not change on the basis of HPV vaccination status.

-- End of Report --

Aditi Raj

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