

# Maternal Serum Screen 4

## TECHNICAL UPDATE

### DESCRIPTION/BACKGROUND INFORMATION

Prenatal testing is routinely offered to pregnant women to screen for neural tube defects, Down Syndrome, and Trisomy 18-risk assessment. Neural tube risk assessment is based on alpha-fetoprotein (AFP) alone, whereas Down syndrome and Trisomy 18-risk assessment are based on multiple marker combinations that may include maternal age, AFP, human chorionic gonadotropin (hCG), and unconjugated estriol (uE<sub>3</sub>).

Recent studies have demonstrated that by adding Inhibin A to the Down Syndrome risk assessment, the detection rate was improved by approximately 10%. During pregnancy, Inhibin A is secreted from both the corpus luteum and the placenta. In Down Syndrome pregnancies, Inhibin A levels are 2-fold higher than in unaffected pregnancies leading to detection of approximately 40% of Down syndrome fetuses at a 5% false positive rate. When combined with maternal age, AFP, hCG, and uE<sub>3</sub>, the detection rate increases to approximately 75%.

### CLINICAL APPLICATION

Concentrations of AFP, hCG, uE<sub>3</sub>, and Inhibin A are determined. The multiple of the median (MoM) is calculated for each. Different medians are used for African American and Asian populations for AFP, hCG, and uE<sub>3</sub>. MoM values for all analytes are adjusted for maternal weight; however, only the AFP MoM is adjusted for insulin dependent diabetes status. All 4 MoM values are combined with maternal age at time of delivery to determine the Down syndrome risk. Trisomy 18-risk is based on maternal age and AFP, hCG, and uE<sub>3</sub> MoMs. Neural tube defect risk is based on the AFP MoM only.

### **91011 Prenatal Quad Panel\*<sup>‡</sup>**

<b>SPECIMEN:</b>	3 mL Serum (Min 2.0 mL)
<b>COLLECTION NOTES:</b>	Provide gestational information. Must collect between 15 – 20 weeks gestation
<b>SERUM SEPARATOR TUBE:</b>	Yes
<b>SUBMIT:</b>	Frozen
<b>REFERENCE RANGE:</b>	See report
<b>METHODOLOGY:</b>	Fluoroimmuno-metric/Enzyme-Linked Immunosorbent Assay
<b>CPT CODES:</b>	82677, 86336, 82105, 84702
<b>TURN AROUND TIMES:</b>	3-8 Days

**SAMPLE RESULTS:**

<b>TEST</b>	<b>VALUE</b>	<b>REFERENCE RANGE</b>	<b>UNITS</b>
PRENATAL RISK PANEL			
SPECIMEN	FIRST		
MATERNAL AGE	27.5		YRS
DATING	LNMP		
EDD	4/18/2003		
GESTATIONAL AGE	18.43		WKS
MATERNAL WEIGHT	163		LBS
MAT. INSULIN DM	NO		
FAMILY HX of NTD	NO		
MATERNAL RACE	WHITE		
NUMBER OF FETUSES	ONE		
PATIENT'S AFP	32		ng/mL
MoM for AFP	0.7		
PATIENT'S hCG	17059		IU/L
MoM for hCG	1.0		
PATIENT'S uE3	1.30		ng/mL
MoM for uE3	0.8		
PATIENT'S DIA	150		pg/mL
MoM for DIA	1.0		
INTERPRETATION	NORMAL		
<b>RISKS</b>	<b>PRE-TEST</b>	<b>POST-TEST</b>	<b>(CUTOFF)</b>
OPEN NTD	1 in 900	<1 in 10000	
DOWN SYNDROME	1 in 890	1 in 1400	(1 in 190)
TRISOMY 18	1 in 3600	<1 in 10000	(1 in 100)

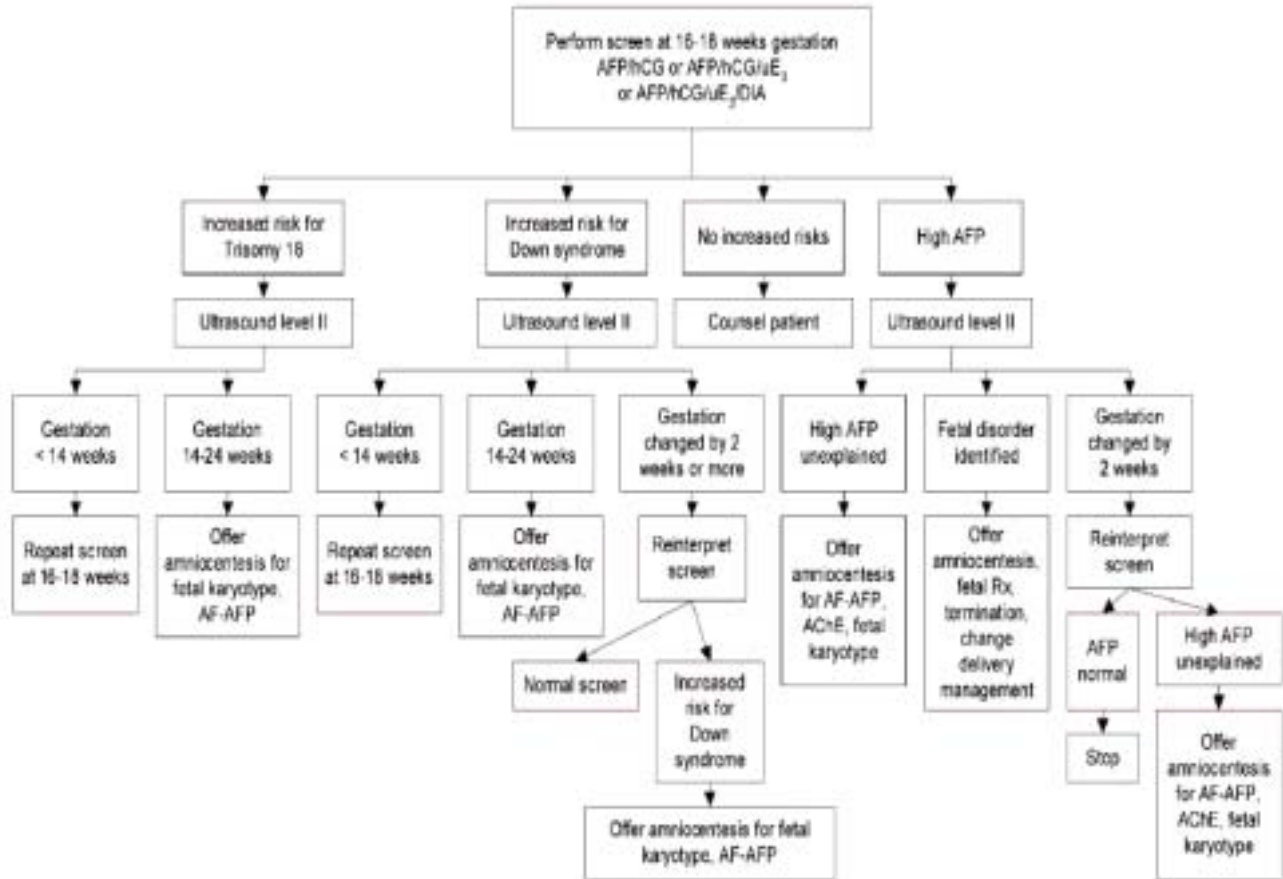
Interpretation based on patient information provided to the laboratory

The maternal Screen report lists the patient information provided to the laboratory. The patient's AFP, hCG, uE<sub>3</sub>, and DIA (Inhibin A) values with the corresponding Multiple of Means (MoM). An interpretation as to whether the screen is normal or abnormal is included.

The probability of the risks of the fetus having Open Neural Tube Defect, Down Syndrome, and Trisomy 18 at pre-test (i.e. the risks associated with the maternal information in the general population) and post-test (i.e. the risks after the tests were performed) are included to help the clinician in counseling the patient.

The (CUTOFF) numbers are included to show where an abnormal interpretation is derived from, e.g. for Down Syndrome, an abnormal interpretation would be generated if the post-test probability is greater than 1 in 190.

*Continued/...*



## REFERENCES

1. Wenk, R.E. and Rosenbaum, J.M. Examination of Amniotic Fluid in Clinical Diagnosis and Management by Laboratory Methods, 19<sup>th</sup> edition. John B. Henry, editor. W.B. Saunders. Pgs. 494-498.
2. Ashwood, E.R. Pregnancy in Tietz Fundamentals of Clinical Chemistry, 5<sup>th</sup> Edition. Carl A. Bartis and Edward R. Ashwood, editors. 2001, W.B. Saunders. pp 898-921.
3. ARUP Laboratories, 500 Chipeta Way, Salt Lake City, Utah.