OBSTETRICS LAB VALUES & ASSOCIATED DISORDERS

PREGNANCY-SPECIFIC HORMONES

β-hCG (Human Chorionic Gonadotropin)

NORMAL: Doubles every 48h in early pregnancy
Week 3: 5-50 mIU/mL | Week 4: 5-426
Week 5: 18-7,340 | Week 6-8: 1,080-56,500
Peak at 10-12 weeks, then ↓

↑ INCREASED:
- **Molar pregnancy:** Very high (>100,000), "snowstorm" on US, no fetal parts
- **Multiple gestation:** Twins, triplets
- **Trisomy 21 (Down syndrome):** Elevated β-hCG
- **Choriocarcinoma:** Malignant trophoblastic disease

↓ DECREASED or NOT DOUBLING:
- **Ectopic pregnancy:** Plateau or slow rise, not doubling q48h
- **Spontaneous abortion:** Declining levels
- **Trisomy 18 (Edwards):** Low β-hCG
- **Blighted ovum:** Abnormal rise

🎯 **KEY: β-hCG >1500-2000 should see gestational sac on TVUS. If not = ectopic until proven otherwise**

AFP (Alpha-Fetoprotein)

NORMAL: Peaks at 13-14 weeks
Measured at 15-20 weeks (quad screen)
15-20 ng/mL (maternal serum)

↑ INCREASED:
- **Neural tube defects:** Anencephaly, spina bifida (open NTD)
- **Abdominal wall defects:** Gastroschisis, omphalocele
- **Multiple gestation:** Twins/triplets
- **Wrong dates:** Underestimated gestational age
- **Fetal demise**

↓ DECREASED:
- **Trisomy 21 (Down syndrome)**
- **Trisomy 18 (Edwards syndrome)**
- **Wrong dates:** Overestimated gestational age

🎯 **If ↑AFP → Check with US for anomalies → If still ↑ → Amniocentesis for AFP + Acetylcholinesterase (AChE)**

Estriol (uE3)

NORMAL: Increases throughout pregnancy
Part of quad screen (15-20 weeks)

↓ DECREASED:
- **Trisomy 21 (Down syndrome)**
- **Trisomy 18 (Edwards syndrome):** Very low
- **Placental sulfatase deficiency**
- **Anencephaly**
- **Fetal adrenal hypoplasia**

Inhibin A

NORMAL: Part of quad screen (15-20 weeks)

↑ INCREASED:
- **Trisomy 21 (Down syndrome)**
- **Preeclampsia risk**

↓ DECREASED:
- **Trisomy 18 (Edwards syndrome)**

PAPP-A (Pregnancy-Associated Plasma Protein A)

NORMAL: Part of 1st trimester screen (11-14 weeks)

↓ DECREASED:
- **Trisomy 21 (Down syndrome)**
- **Trisomy 18 (Edwards syndrome)**
- **Increased risk of:** Preeclampsia, IUGR, preterm birth

HEMATOLOGY

Hemoglobin (Hgb)

NORMAL: 11-14 g/dL (pregnancy)
Physiologic anemia in 2nd trimester (dilutional)

↓ DECREASED (Anemia <11 g/dL):
- **Iron deficiency:** Most common. ↓MCV, ↓ferritin, ↑TIBC. Rx: Iron supplementation
- **Folate deficiency:** ↑MCV, megaloblastic. Risk: NTDs. Rx: Folic acid
- **B12 deficiency:** ↑MCV. Rare in pregnancy
- **Thalassemia:** ↓MCV, normal/↑RBC count, normal ferritin
- **Sickle cell disease:** Hemolysis, crises, complications
- **Acute hemorrhage:** Placental abruption, previa, PPH

Platelets

NORMAL: 150,000-400,000/μL
Mild ↓ in late pregnancy is physiologic (gestational thrombocytopenia >70K)

↓ DECREASED (Thrombocytopenia):
- **HELLP syndrome:** <100,000. Hemolysis, ↑liver enzymes, HTN, RUQ pain
- **Preeclampsia:** Severe features with Plt <100,000
- **ITP (Immune thrombocytopenia):** Isolated ↓Plt, no other symptoms
- **TTP:** Pentad - thrombocytopenia, microangiopathic hemolytic anemia, fever, renal failure, neuro changes
- **DIC:** Placental abruption, retained products, amniotic fluid embolism
- **Acute fatty liver of pregnancy:** Rare, 3rd trimester

🎯 **Plt <100K in pregnancy = Investigate for preeclampsia/HELLP first!**

WBC (White Blood Cells)

NORMAL: 6,000-16,000/μL (pregnancy)
Can ↑ up to 20,000-30,000 during labor

↑ INCREASED (Leukocytosis):
- **Chorioamnionitis:** Fever, uterine tenderness, fetal tachycardia
- **Appendicitis:** RLQ pain (may shift in pregnancy)
- **Pyelonephritis:** Fever, CVA tenderness, WBC casts
- **Labor:** Physiologic increase

CHEMISTRY & METABOLIC

Glucose

NORMAL PREGNANCY VALUES:
Fasting: <95 mg/dL | 1h postprandial: <140 mg/dL
2h postprandial: <120 mg/dL

GDM SCREENING (24-28 weeks):
50g GCT: ≥140 mg/dL → Do 100g OGTT
100g OGTT: Fasting ≥95, 1h ≥180, 2h ≥155, 3h ≥140
(2 or more abnormal = GDM diagnosis)

↑ INCREASED (Hyperglycemia):
- **Gestational diabetes (GDM):** Onset in pregnancy
- **Pre-existing DM:** Type 1 or Type 2
- **Maternal complications:** Preeclampsia, polyhydramnios, C-section, infections
- **Fetal complications:** Macrosomia (>4000g), shoulder dystocia, birth trauma, hypoglycemia, RDS, polycythemia, hyperbilirubinemia
- **Long-term:** Obesity, T2DM in offspring

🎯 **First prenatal visit: Screen for pre-existing DM with fasting glucose or HbA1c**

Creatinine (Cr)

NORMAL: 0.4-0.8 mg/dL (pregnancy)
↓ compared to non-pregnant due to ↑GFR

↑ INCREASED (>1.1 mg/dL = abnormal):
- **Preeclampsia with severe features:** Cr >1.1, oliguria
- **HELLP syndrome**
- **Acute kidney injury:** Severe dehydration, ATN
- **Chronic kidney disease:** Pre-existing
- **Acute fatty liver of pregnancy**

Liver Enzymes (AST/ALT)

NORMAL: AST/ALT <40 U/L

↑ INCREASED (Elevated Transaminases):
- **HELLP syndrome:** AST/ALT >70 U/L, hemolysis, ↓platelets
- **Acute fatty liver of pregnancy:** 3rd trimester, hypoglycemia, coagulopathy, ↑ammonia
- **Intrahepatic cholestasis of pregnancy:** Pruritus (palms/soles), ↑bile acids, risk stillbirth
- **Viral hepatitis:** Hepatitis A, B, C, E
- **Preeclampsia**

Bilirubin

NORMAL: Total <1.2 mg/dL

↑ INCREASED (Hyperbilirubinemia):
- **HELLP syndrome:** Hemolysis → ↑indirect bilirubin
- **Intrahepatic cholestasis:** ↑conjugated bilirubin
- **Acute fatty liver of pregnancy**
- **Hemolytic anemia:** Sickle cell, thalassemia

COAGULATION

PT/INR & aPTT

NORMAL: PT 11-13 sec, INR <1.2
aPTT 25-35 sec

↑ PROLONGED (Coagulopathy):
- **DIC:** Placental abruption, amniotic fluid embolism, fetal demise, HELLP. ↓fibrinogen, ↑D-dimer, ↓platelets
- **Acute fatty liver:** Liver failure
- **Warfarin use:** ↑PT/INR (teratogenic!)
- **Vitamin K deficiency**

Fibrinogen

NORMAL: 300-600 mg/dL (pregnancy)
↑ compared to non-pregnant

↓ DECREASED (<200 mg/dL):
- **DIC:** Consumptive coagulopathy
- **Placental abruption:** Massive hemorrhage
- **Amniotic fluid embolism:** Acute, severe

URINALYSIS

Protein (Urine)

NORMAL: <300 mg/24h or
Protein/Cr ratio <0.3

↑ INCREASED (Proteinuria):
- **Preeclampsia:** ≥300 mg/24h or P/Cr ≥0.3. HTN + proteinuria ≥20 weeks
- **Chronic kidney disease:** Pre-existing
- **Lupus nephritis:** SLE in pregnancy
- **UTI/Pyelonephritis:** With other findings

Bacteria/Nitrites/Leukocyte Esterase

NORMAL: Negative

↑ POSITIVE:
- **Asymptomatic bacteriuria:** ≥100,000 CFU/mL. Screen all pregnant women. Rx: Antibiotics (prevents pyelonephritis)
- **UTI:** Dysuria, frequency, urgency
- **Pyelonephritis:** Fever, CVA tenderness, N/V. Most common cause of sepsis in pregnancy

🎯 **GBS bacteriuria = Heavy colonization → Treat + Give intrapartum prophylaxis**

INFECTIOUS DISEASE

RPR/VDRL (Syphilis)

NORMAL: Negative/Non-reactive
Screen at 1st visit (all pregnancies)

↑ POSITIVE:
- **Syphilis:** Confirm with FTA-ABS or TP-PA
- **Congenital syphilis:** Hutchinson teeth, saddle nose, saber shins, stillbirth
- **Treatment:** Benzathine penicillin G (only effective Rx in pregnancy)
- **Jarisch-Herxheimer reaction:** Fever, contractions after 1st dose

Rubella IgG

NORMAL: Positive/Immune (most adults vaccinated)

↓ NEGATIVE (Non-immune):
- **Susceptible to rubella infection**
- **Avoid live vaccine in pregnancy**
- **Vaccinate postpartum (MMR)**
- **If infection occurs:** Cataracts, deafness, PDA, "blueberry muffin" rash

GBS (Group B Streptococcus)

NORMAL: Screen at 35-37 weeks (vaginal/rectal swab)

↑ POSITIVE:
- **GBS colonization (15-40% of women)**
- **Risk:** Neonatal sepsis, meningitis, pneumonia
- **Intrapartum prophylaxis:** PCN G or ampicillin in labor
- **Always treat:** GBS bacteriuria, previous GBS-affected infant

Rh Status & Antibody Screen

NORMAL: Rh positive or Rh negative with negative antibody screen

Rh NEGATIVE (Risk of Isoimmunization):
- **Give RhoGAM (300 μg):** 28 weeks + within 72h postpartum (if baby Rh+)
- **Also give after:** Abortion, ectopic, amnio, CVS, bleeding, trauma, abruption
- **If antibody screen positive:** Already sensitized. Monitor with titers + MCA Doppler
- **Fetal complications:** Hemolytic anemia, hydrops fetalis, kernicterus
- **Severe cases:** Intrauterine transfusion, early delivery

QUICK REFERENCE

QUAD SCREEN PATTERNS:
- **T21 (Down):** ↓AFP, ↑hCG, ↓Estriol, ↑Inhibin A
- **T18 (Edwards):** ↓AFP, ↓hCG, ↓Estriol, ↓Inhibin A
- **NTD:** ↑AFP (+ ↑AChE on amnio)
- **Abd wall defect:** ↑AFP (normal AChE)

HELLP CRITERIA: Hemolysis (schistocytes, ↑LDH, ↑bili), Elevated Liver enzymes (AST/ALT >70), Low Platelets (<100K)

DIC LABS: ↓Fibrinogen (<200), ↑PT/aPTT, ↓Platelets, ↑D-dimer, schistocytes