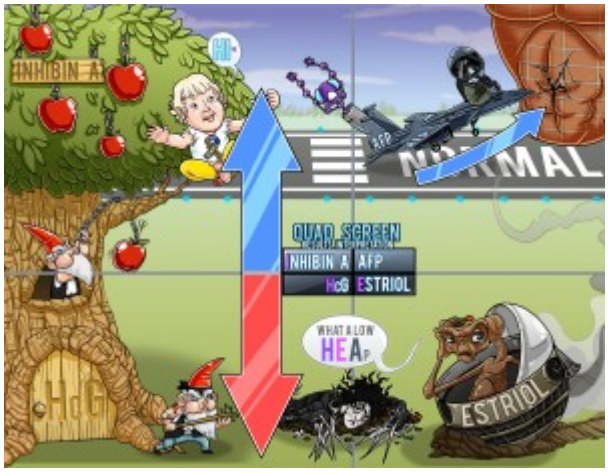
Quad Screen Results Interpretation

Markers to assess fetal well-being are often combined into a quad screen because their power lies in their use together. The quad screen views Inhibin A, hCG, AFP, and estriol levels to assess the fetus' risk of chromosomal abnormality. Using these markers, we can predict specific defects. For example, increased hCG and Inhibin A suggest Down syndrome. Decreased hCG, Estriol, and AFP suggest Edward syndrome. Increased AFP can suggest neural tube defects or abdominal wall defects.



PLAY PICMONIC

Markers

AFP
Air Force Pilot
Alpha-fetoprotein (AFP) is found in both fetal serum and amniotic fluid. This protein is produced early in gestation by the fetal yolk sac and later in the liver and gastrointestinal tract. This value is then combined with other markers, as well as the mothers' age and family history, to assess the risk for abnormalities.

Estriol
Extra-terrestial
Estriol is only produced in significant amounts during pregnancy, as it is made by the placenta. If levels of unconjugated estriol are abnormally low in a pregnant woman, this may indicate chromosomal or congenital anomalies like Down syndrome or Edward syndrome.

hCG
Hard-Core-Gnome
Human chorionic gonadotropin (hCG) is a hormone produced by a portion of the placenta following implantation. It is used to detect pregnancy and diagnose and monitor germ cell tumors as well as gestational trophoblastic diseases. It is combined with other markers to assess fetal disorders in the quad test.

Inhibin A
Inhibiting-chains Apple-tree
Inhibin is produced in the gonads, pituitary gland, placenta, corpus luteum, and other organs. It plays a role in regulating FSH, but when combined with other serological markers, it is useful in screening for fetal disorders and aneuploidies.

Associations

Increased hCG + Inhibin A (HIgh)
HIgh
Quad screen results revealing increased hCG and inhibin A suggest Down syndrome. This can be remembered by the mnemonic “HIgh.”

Down Syndrome
Child with Down Syndrome
Down syndrome is a genetic disorder associated with trisomy of chromosome 21. Patients have characteristic facies, mild to moderate learning disability, congenital cardiac abnormalities, and hypotonia, among others.

Decreased hCG + Estriol + AFP (Low HEAp)
Low HEAp
Decreased hCG, estriol, and AFP suggest Edward syndrome. This can be remembered by the mnemonic “Low HEAp.”

Edward Syndrome

Edward Scissorhands

Edward syndrome is a genetic disorder most frequently associated with trisomy of chromosome 18. The presentation of Edward syndrome is highly variable but typically includes craniofacial abnormalities, rocker-bottom feet, and clenched fists with the index finger and thumb overlying the middle digits.

Increased AFP

Up-arrow Air Force Pilot

Elevated AFP on a quad screen can suggest neural tube defects or abdominal wall defects. Patients should receive a follow-up ultrasound in order to confirm the diagnosis.

Neural Tube Defects

Neuron Tube Defective

Neural tube defects are some of the most common congenital anomalies seen. They result from incomplete closure of the neural tube during embryonic development. The presentations are varied but include spina bifida cystica, spina bifida occulta, myeloschisis, and anencephaly.

Abdominal Wall Defects

Abdominal Wall Defective

Abdominal wall defects can be detected on the maternal quad screen by increased levels of AFP. Abdominal wall defects include omphalocele, or a protrusion of peritoneum-covered abdominal contents through the umbilical cord, or gastroschisis, which is defined by non-peritoneum-covered abdominal contents protruding through the abdominal wall.