INTRODUCTION

The incidence of twins has steadily increased in the past 20 years primarily due to fertility treatments. In the United States, twins comprise approximately 1.5% of all pregnancies yet twin births represent 10% of all perinatal morbidity and mortality. This is significantly higher than what is reported for singleton pregnancies. Preclampsia, hypertension, placental complications, and postpartum hemorrhage are among the more frequent causes of maternal mortality. In the fetus, common complications include prematurity, intrauterine growth retardation, and congenital anomalies. In addition, there are other unique complications that occur in monochorionic twin pregnancies which include: twin transfusion, twin embolization, conjoined twinning, and twin reversed arterial perfusion syndrome.

Twin gestations can test the technical and diagnostic skills of the sonographer and sonologist. Therefore, radiologists and obstetricians need a practical approach in monitoring changes that can adversely impact the outcome of these pregnancies. Such an approach should consist of three essential components: determination of chorionicity and amnionicity, determination of appropriate growth and the detection of congenital anomalies. Early detection of abnormalities related to these essentials can lead to management decisions that can improve perinatal outcome.

SUGGESTED READING:
It is important to determine if twin growth is concordant or discordant. From measurements of fetal head, abdomen and femur, the fetal weights are estimated and compared. The difference between two fetal weights is divided by the weight of the larger twin to determine percent discordance. Discordant growth is defined by a difference in birthweight of 20% or more. Discordant growth leads to significant increase in morbidity and mortality as compared to twin gestations with concordant growth. Discordant growth may be due to chromosomal abnormalities, in utero infection or placental abnormalities. In monozygotic pregnancies vascular shunting between twins through the placenta may be a source of major discordance in twin gestations.

### A. Abnormalities Not Specific To Twins

These types of abnormalities found in twins are not any different from those seen in singletons. However, the incidence of congenital anomalies has been found to be 2 to 5 times more prevalent in monzygotic twins than in dizygotic twins or singleton gestations. More specifically, chromosomal abnormalities have been found to be increased two-fold in dizygotic twins compared with singleton gestations.

### B. Abnormalities Specific To Monochorionic Twins

In addition to structural anomalies, there are unique abnormalities unique to monzygotic twins. They include twin transfusion syndrome, twin embolization, conjoined twinning and twins-reversed arterial perfusion sequence.

#### Twin-Twin Transfusion Syndrome
- complication of 15-50% of monochorionic twin gestations
- commonly occurs in the late second or third trimester
- result of unbalanced flow of blood across the placental vascular communications from one donor fetus to a recipient fetus
- one twin usually has marked polyhydramnios and the other twin usually has oligohydramnios
- usually a birthweight discrepancy of greater than 20%
- larger twin also frequently plethoric and hydropic
- smaller fetus is usually anemic and may appear stuck or fixed to the uterine wall (stuck twin syndrome)
- stick twin is not pathognomonic for twin-twin transfusion; can also be seen in IUGR of smaller twin without associated placental anastomosis

#### Discordant Growth

Concordant growth is defined by a twin to determine percent discordance. It is divided by the weight of the larger twin.

#### Twin-Embolic Sequence
- twin in a living twin secondary to in utero co-twin demise
- observed in cases where co-twin demise occurs later in pregnancy usually after 20 weeks; co-twin may develop an infant or necrosis of highly vascular organs, i.e. the brain, liver, and kidneys
- early loss occurring in the 1st trimester usually has little effect on the surviving fetus

#### Twin-Twin Reversed Arterial Perfusion Sequence (Acardiac Twin)
- rare anomaly of monochorionic, monoamniotic twin pregnancies
- anomaly is the most extreme manifestation of Twin-Twin transfusion
- characterized by a severely malformed co-twin with either an absent heart or a nonfunctional cardiac structure
- acardiac fetus is considered a parasite because of its need for pumped blood from the normal twin
- associated with arterial to arterial and venous to venous placental anastomoses causing an imbalance of the interfetal circulation leading to reversed blood flow in the umbilical artery of the recipient twin which causes secondary atrophy of the heart
- diffuse edema and cystic hygroma are usually present in the acardiac twin
- Doppler evaluation shows reversed flow in the umbilical cord of the acardiac twin