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Twin Pregnancy

Purpose: To provide guidance on the methods used to determine gestational age, chorionicity, screening for chromosomal and structural abnormalities, and screening for TTTS, TAPS, growth abnormalities, and preterm birth in twin pregnancy.

Addendums: Flow Diagram for management of Twin pregnancy; Diagnostic criteria/staging and management of TTTS and TAPS

I. Dating

a. Dating determined by crown-rump length is 45-84mm (<13 6/7 weeks); composite biometry if >14 weeks
b. Use the larger of the two twins to date the pregnancy if spontaneous conception
c. If IVF pregnancy, use oocyte retrieval date or embryonic age from fertilization.

II. Chorionicity and Amnionicity

a. Best determined prior to 14 weeks using membrane thickness at site of membrane insertion into placenta, and number of placental masses.
b. Lambda sign (twin peak sign), 2 placental masses, or discordant sex- dichorionic, T sign- monochorionic
c. Single Yolk sac or cord entanglement: monoamniotic; Double yolk sac: diamniotic
d. If pregnancy is advanced and chorionicity cannot be determined, manage conservatively as monochorionic and consider NIPT

III. Aneuploidy Screening

a. No method of aneuploidy screening that includes a serum sample is as accurate in twin gestations as it is in singleton pregnancies.
b. First trimester Nuchal translucency screening +/- analyte screening can be used with similar cutoffs as singleton pregnancy
c. Cell-free DNA screening data is emerging and suggests that the sensitivity of Trisomy 21- is similar to singletons when a result is obtained. However, there is a higher risk for test failure.
d. If there is a fetal demise, vanishing twin, or anomaly in one fetus, there is a high risk for inaccurate test result with serum-based screening or cell-free DNA.
e. Diagnostic testing can be offered with CVS or amniocentesis: sample both placentas/sacs if dichorionic and single placenta/sac if monochorionic. The procedure associated pregnancy loss rates are similar for both tests and increased compared to singletons, 1-1.8%

IV. Identification of structural anomalies

a. All twin pregnancies should undergo detailed anatomy ultrasound at 18-20 weeks gestation.
b. Monochorionic twin pregnancies are at higher risk for cardiac anomalies and fetal echocardiogram should be performed at 22-24 weeks gestation.

V. Screening for Preterm Birth

a. Perform cervical length measurement at anatomy ultrasound for risk assessment for preterm birth.
b. If cervical length measures <25mm, consider vaginal progesterone after counseling. If cervical length is <3cm, then recommend follow-up screen in 1 week.

c. If cervical length is <15mm, then concurrent vaginal exam should be performed to rule out cervical dilation and need for exam-indicated cerclage. Refer to (preterm birth screening) protocol**
d. The use of 17-OHP, cerclage, and pessary in twins with asymptomatic cervical shortening is not recommended. Exam-indicated cerclage should be considered in patients with cervical dilation <23-24 weeks gestation.

VI. Growth Surveillance

a. Perform growth q4 weeks in dichorionic twin pregnancies following anatomy ultrasound
b. Perform growth q4 weeks in monochorionic twin pregnancies following anatomy ultrasound.
c. Discordant growth is diagnosed as ≥ 20%. Multi-fetal gestations with discordant but appropriate for GA growth are not at increased risk for fetal or neonatal morbidity. If at least one fetus in a discordant pair is growth restricted, then there is a 7.7 fold increased risk for major neonatal morbidity.
d. Dichorionic twin gestations with discordance and FGR should be managed per FGR protocol: ultrasounds q2 weeks for growth, twice weekly BPP with weekly UA Doppler studies.
e. Individualize care for Monochorionic twin gestations with discordant growth.
f. Selective fetal growth restriction (sFGR) is diagnosed when one fetus has an EFW <10th percentile and the intertwin discordance is >25%. If one or both twin meets criteria for FGR, then follow FGR protocol. In cases of sFGR, monitor growth q2 weeks per FGR protocol

VII. Antenatal Fetal Surveillance

a. Dichorionic twin gestation: Weekly BPP starting at 36 weeks
b. Monochorionic-diamniotic twin gestation: Weekly BPP at 32 weeks
c. Monochorionic-monoamniotic twin gestation: Consider admission to the hospital at viability to 28 weeks after patient counseling. Inpatient monitoring with 1hr TID NST, with additional monitoring as indicated or after counseling with patient.
d. In cases of sFGR, initiate antenatal testing twice weekly with weekly UA Doppler per FGR protocol.

VIII. Screening for Twin to Twin Transfusion Syndrome (TTTS)

a. Occurs in 10-15% of monochorionic twin pregnancies
b. Screening for TTTS with assessment of DVP and presence of bladders: Begin at 16 weeks and continue q2 weeks.
c. Routine use of UA Doppler for screening is not indicated. Weekly UA Doppler should be performed if FGR, growth discordance, or fluid discrepancy (≥4cm) is diagnosed. If TTTS is suspected or diagnosed, refer to a fetal therapy center.
d. If discordant fluid is identified, not yet meeting criteria for diagnosis of TTTS, perform UA Doppler and increase monitoring to weekly.

IX. Screening for Twin Anemia Polycythemia Sequence (TAPS)

a. TAPS occurs spontaneously in up to 5% of monochorionic pregnancies, and 13% following SFLP for TTTS.
b. Screening for TAPs with assessment of MCA PSV should begin at 20 weeks gestation and continue q2 weeks.
c. If TAPS is suspected or diagnosed <34 weeks, refer to a fetal therapy center.

X. Delivery Timing in Twin Gestation

a. Dichorionic Twin Gestation: 38 weeks; if FGR then 36-37 6/7 weeks
b. Monochorionic-Diamniotic Twin Gestation: 34-37 6/7 weeks; if sFGR then 32-34 6/7 weeks

c. Monochorionic-Monoamniotic Twin Gestation: 32-34 weeks

XI. Other Considerations in Twin Pregnancy

a. Twin pregnancies are at elevated risk for preeclampsia. Low dose aspirin should be initiated between 12-28 weeks (ideally <16 weeks gestation) and continued until delivery for preeclampsia risk reduction.

b. Maternal Weight Gain based on 2009 Institute of Medicine Recommendations:

BMI	Recommended Weight Gain
Normal (18.5-24.9)	37-54 lbs
Overweight (25-29.9)	31-50 lbs
Obese (≥ 30)	25-42 lbs

Nutrition Consultation recommended in 1st trimester- follow micronutrient recommendations. Increase PNV to 2 tablets at 14 weeks gestation.

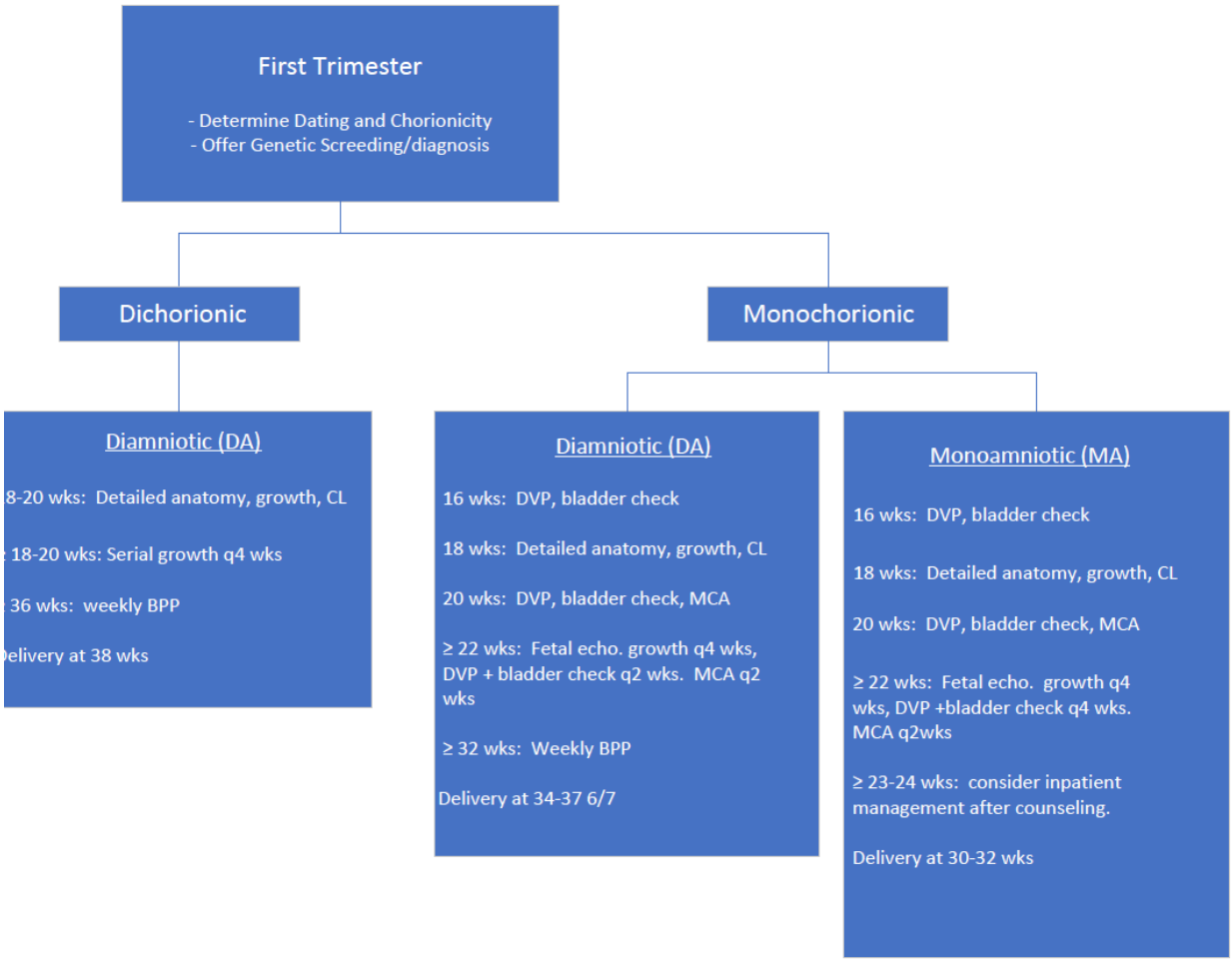
c. Preterm labor in twin pregnancy should be treated similarly to singletons, per preterm labor protocol

d. Antenatal steroids should be given for same indications as singletons, threatened preterm delivery within 7 days at viability-34 weeks gestation.

e. Demise of one twin
   i. Conservative management is the most appropriate course of action.
   ii. In monochorionic twin pregnancy, the surviving twin may lose circulating volume to the demised twin, resulting in hypoperfusion and potential brain injury or death. Obtain MCA-PSV to screen for fetal anemia. Biometry, UA Doppler, and MCA Doppler should be obtained every 2 weeks, with twice weekly BPP. Delivery at 34 weeks.
   iii. Obtain fetal brain MRI at 4-6 weeks post-demise to evaluate for neurological abnormality.
   iv. Following single twin demise, the following complications are seen:

Complication	Dichorionic	Monochorionic
Death of co-twin	3%	15%
Preterm Delivery	54%	68%
Abnormal postnatal MRI in survivor	16%	34%
Neurodevelopmental impairment of survivor	2%	26%

ADDENDUM 1: Flow Diagram for Management of Twin Pregnancy



ADDENDUM 2:

Diagnosis, Staging and Management of TTTS

Quintero Staging

Stage	Classification
I	Polyhydramnios-Oligohydramnios Sequence DVP >8cm in Recipient and DVP <2cm in Donor
II	Donor with non-visualized bladder
III	Absent or reversed EDF in umbilical artery, reversed ductus venosus a-wave, or pulsatile umbilical venous flow in either twin
IV	Hydrops in one or both twins
V	Death of one or both twins

Some fetal centers consider degree of cardiomyopathy on fetal echo in staging system.

Treatment of TTTS:

Quintero Stage 1: Conservative management or consideration for selective fetoscopic laser ablation (SFLP)

Quintero Stage 2 or greater: SFLP is treatment of choice

Followup of Twin Pregnancy s/p SFLP:

1. Weekly fluid assessment and Doppler studies (UA and MCA) x at least 2 weeks and reduce to every other week after clinical resolution. Risks of recurrent TTTS after SFLP is 5-14%.
2. Twice weekly antenatal testing by 32 weeks gestation.
3. Delivery at 34 weeks gestation

ADDENDUM 3:

Diagnosis, Staging and Management of TAPS

Stage	Classification
1	Donor MCA-PSV>1.5 MoM and recipient MCA-PSV <1.0 MoM, without other signs of fetal compromise
2	Donor MCA-PSV >1.7 MoM and recipient MCA-PSV <0.8 MoM, without other signs of fetal compromise
3	Stage 1 or 2 and cardiac compromise in donor (UA-AREDF, UV pulsatile flow, or DV increased or reversed flow)
4	Hydrops of donor twin
5	Death of one or both fetuses, preceded by TAPS

I. In monochorionic twins complicated by TAPS, the risk for neurodevelopmental delay is 20%.
II. Brain imaging in the 3rd trimester and neurodevelopmental assessment neonatally is indicated.
III. Management depends on GA at diagnosis, parental choice, severity of disease, and technical feasibility of intrauterine transfusion, and therefore should be individualized.
IV. Treatment options include conservative management, early delivery, laser ablation, or intrauterine blood transfusion.

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