Community Care
OF NORTH CAROLINA

Pregnancy Medical Home Program Care Pathway

Management of Multifetal Pregnancy

August 2019

Introduction

The number of twin pregnancies in the US has increased in recent decades, but over the past 3 years, has been stable. In 2017, the rate of twins was 33.3/1000 births. The rate of triplet and higher order multiple births in the United States has also been stable at 1.02/1000 births in 2017, but this represents the lowest reported in more than 2 decades (peaked in 1998).[1]

Multifetal pregnancies contribute to a disproportionate share of perinatal morbidity, specifically growth delay and prematurity. The mean gestational age at birth for twin pregnancy is 35.3 weeks with a mean birthweight of 2,336 grams, compared to 38.7 weeks and 3,296 grams for singleton gestation.[1,2] Maternal and obstetric complications, including preeclampsia, gestational diabetes, cesarean delivery and postpartum hemorrhage are all more frequent in multifetal pregnancies.

Monozygotic twins have unique risks, such as twin-twin transfusion syndrome (TTTS), twin anemia polycythemia sequence (TAPS), and unequal placental sharing and thus require individualized care to optimize maternal and neonatal outcomes.

The aim of this pathway is to summarize the recommendations of the Society for Maternal-Fetal Medicine, American Congress of Obstetrics and Gynecology, and the National Institute for Health and Clinical Excellence (NICE) for care of the multifetal pregnancy to optimize perinatal outcomes.

Early establishment of chorionicity is paramount to guide appropriate care and surveillance. Enhancements to prenatal care with multifetal pregnancy include additional maternal laboratory and health screening to determine baseline risk for obstetric complications, appropriate maternal weight gain and optimal nutritional status have been associated with improved birthweights in twins.[3,4] Twin-focused clinic settings that feature a multidisciplinary approach, including providers familiar with the unique maternal, fetal, and obstetric care of twin pregnancies, have been associated with improved twin pregnancy outcome.[5]

Note

Pregnancy Medical Home Care Pathways are intended to assist providers of obstetrical care in the clinical management of problems that can occur during pregnancy. They are intended to support the safest maternal and fetal outcomes for patients receiving care at North Carolina Pregnancy Medical Home practices. This pathway was developed after reviewing the Society for Maternal-Fetal Medicine and the American College of Obstetricians and Gynecologists resources such as practice bulletins, committee opinions, and Guidelines for Perinatal Care as well as current obstetrical literature. PMH Care Pathways offer a framework for the provision of obstetrical care, rather than an inflexible set of mandates. Clinicians should use their professional knowledge and judgment when applying pathway recommendations to their management of individual patients.

Acknowledgements

The CCNC Pregnancy Medical Home leadership would like to thank the following contributors to this pathway for sharing their expertise:

John Allbert, MD
Ugonna Anyanwu, MD
John Byron, MD
Jeff Denney, MD, MS
James DeVente, MD, PhD
Frank Harrison, MD
Phillip Heine, MD
Stephen Lies, MD
Brandon Locklear, MD
Kate Menard, MD, MPH
Arthur Ollendorff, MD
Mark Picton, MD
Harold Pollard, MD
Paul Sparzak, DO
David Stamilio, MD, MSCE
Russell Suda, MD
Velma Taormina, MD, MSE
Jill Wagner, MD
Cathi Weatherly-Jones, MD
Lydia Wright, MD

Special thanks to William Goodnight, MD, MSCR, Clinical Associate Professor in Maternal-Fetal Medicine, UNC Department of Obstetrics & Gynecology, for his contributions to this pathway.

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Levels of Evidence	
Level 1	RCT (Randomized Controlled Trials)
Level 2.1	Controlled trials without randomization
Level 2.2	Cohort, cross sectional
Level 2.3	Cross-sectional and uncontrolled investigational
Level 3	Case study, expert opinion

1 | Prenatal Care for Multifetal Pregnancy

The following are enhancements to routine prenatal care for multifetal pregnancy.

Labs:

- First trimester GDM/DM screen: BMI > 25, maternal age > 35, prior GDM, history of PCOS (Level 3)[2]
- Baseline serum ferritin[3,6]
- Baseline HELLP in the presence of any risk factors for hypertension at intake

Early referral to dietitian for any of the following conditions[3,6]:

- Diagnosis of gestational diabetes
- BMI < 18 or > 30 kg/m2
- Underlying nutritional risk factor (prior bariatric surgery, eating disorder, inflammatory bowel disease)
- Anemia

Initiate low dose aspirin at 12-16 weeks of gestation.

- There may be benefits to initiating up to 28 weeks in patients with delayed entry to prenatal care[7]

Offer screening/diagnostic options in twins.

- See Appendix A

Prenatal visits, in the absence of maternal or fetal complications (Level 3)[6]:

- Every four weeks to 24-26 weeks of gestation
- Every 2 weeks from 24-34 weeks of gestation
- Weekly from 34 weeks of gestation

Assess at each prenatal visit[6]

- Maternal weight
- Maternal blood pressure
- Urine for proteinuria
    - National Institute for Health and Care Excellence (NICE)
- After 20 weeks: assess for symptoms of preterm labor

At time of diagnosis, engage MFM/HROB with experience in multifetal pregnancy.

- Obtain consult or refer for dichorionic placentation
- Refer for monochorionic placentation
- Refer for higher order multifetal pregnancy
- Refer for fetal anomaly, discordant fetal growth, discordant amniotic fluid volume, fetal death after 16 weeks of gestation
- Consider referral for aneuploidy screening, NT (see Appendix C), and anatomy scan

Fundal height assessment of twin growth is not recommended.

2 | Ultrasound Fetal Assessment in Multifetal Pregnancy[8, 22]

Detailed guidance is available in Appendix A and Table 1.

Ultrasound at 11 0/7 – 13 6/7 weeks (CRL 45 – 84mm)[2,9]:

- Determine chorionicity
    - Determines frequency of ultrasound
- Determine fetal number
- Offer to conduct NT and aneuploidy screening
    - See Appendix A
- Establish/confirm gestational age

Detailed anatomic fetal evaluation at 18-20 weeks gestational age:

- Performed by sonographer/physician skilled in ultrasound in twin pregnancies
    - Consider referral to MFM/HROB

Serial assessment of fetal growth by ultrasound in twin pregnancy:

- Assess fetal growth
- Screen for monochorionic-specific twin pregnancy complications every two weeks, starting at 16 weeks
    - Add fetal echo for monochorionic twin[10, 22]
        - See Appendix A
- Determine indication for and timing of antenatal fetal testing

- Fetal echocardiogram for all IVF twins or with other indications for echocardiogram (1st degree relative of fetus with CHD, preexisting DM, etc.) per AIUM guidelines

3 | Antenatal Fetal Testing

Detailed guidance is available in Appendix A and Table 1.

Dichorionic twin pregnancy[2,6]:

- At 28 weeks of gestation, begin daily fetal movement assessment
- With discordant fetal growth: weekly to twice weekly fetal testing
    - Nonstress test (NST) as indicated based on maternal/fetal condition
    - Benefit of antenatal testing in the context of concordant growth and absence of maternal complications is unknown

Monochorionic/diamniotic twin pregnancy[9,10]:

- See Appendix A

4 | Maternal Nutrition/Micronutrient Supplementation

Detailed guidance is available in Appendix B

Consider nutrition/dietitian consultation for twin pregnancy:

- At the time of diagnosis of the twin pregnancy
- For persistent excessive or low maternal weight gain
- Antenatal nutrition consultation is associated with improved breastfeeding rates in twin pregnancy

Maternal weight gain recommendations for multifetal pregnancy (Level 2.3).[9, 11]

- Achievement of maternal BMI specific weight gain guidelines has been associated with increased twin birth weight and later gestational age at delivery, without significant maternal weight retention at 6-8 weeks postpartum (Level 2)

Pre-pregnancy BMI	Total weight gain (kg)	Total weight gain (lbs)	Initial suggested total daily calorie intake
< 18.5 kg/m2	17-25 kg	37-54 lbs*	42-50 cal/kg/day
18.5-24.9 kg/m2	17-25 kg	37-54 lbs	40-45 cal/kg/day
25.0-29.9 kg/m2	14-23 kg	31-50 lbs	30-35 cal/kg/day
≥ 30 kg/m2	11-19 kg	25-42 lbs	30 cal/kg/day

**IOM doesn't report weight gain recommendation for BMI < 18; consider upper end of this range*

Breastfeeding support:

- Review recommendations and reinforce ability to breastfeed multifetal pregnancy
- Recommend third trimester consultation with lactation consultant (Level 2.2)
    - Antenatal nutrition consultation has been associated with improved breastfeeding rates in multifetal pregnancy
- Recommend continuation during lactation of increased calorie intake and micronutrient supplementation as during pregnancy

5 | Delivery

Timing of delivery (Level 1-2.3):

The mean gestational age at delivery of twin pregnancy is 35-36 weeks EGA and the risk of perinatal morbidity increases after 38 0/7 weeks, thus timing of elective delivery of twin pregnancy is suggested to balance the risk of prematurity and the risk of perinatal morbidity from prolonged gestation.

- Uncomplicated twin pregnancy (defined as absence of maternal complications or fetal growth abnormalities): (Level 1-2)[2,6]

    - Dichorionic, diamniotic: 37 0/7 – 38 6/7 weeks EGA
    - Monochorionic, diamniotic: 36 0/7 – 37 6/7 weeks EGA
    - Monoamniotic: 32-34 weeks EGA (individualize)
- Abnormal/discordant fetal growth
    - Individualize timing of delivery in consultation with maternal fetal medicine
- If delivery is not undertaken according to the suggested timeframe in Section 5: Delivery (above), initiate or continue antenatal testing, such as weekly or twice weekly non-stress testing and weekly amniotic fluid volume assessment

Mode of delivery (Level 1):

For twin pregnancies that are candidates for vaginal delivery, there is no evidence of improved maternal or neonatal outcome with cesarean delivery compared to vaginal delivery (Level 1).[12] There is data to suggest that vaginal delivery may avoid intrapartum or postpartum severe acute maternal morbidity significantly.[21] Elective cesarean may be indicated in low resource settings not meeting the criteria.

Candidates (based on criteria for the Twin Birth Study) for trial of vaginal delivery of twins (Level 1-3)[12]:

- Pregnancy characteristics
    - Diamniotic twin pregnancy
    - Twin A cephalic presentation
        - Twin B with non-vertex presentation: EFW (of each fetus) > 1500 grams and < 4000 grams and Twin B EFW not greater that 20% larger than twin A
- Exclusions
    - More than one prior LTCS; prior vertical uterine incision, other contraindication to vaginal delivery, fetal anomaly that contraindicates vaginal delivery
- Clinical setting
    - Provider and institution experienced with twin delivery, including management of non-vertex second twin
    - Immediate availability of cesarean delivery
    - Strong consideration for delivery in OR setting with anesthesia provider present
    - Maternal IV access
    - Strong consideration for working maternal epidural in active labor
    - Continuous fetal monitoring
    - Nursing availability for mother as well as each neonate
    - Patient concurs with plan for attempted vaginal delivery

Monitor blood pressure and watch for postpartum hemorrhage.[21]

If delivery is eminent (within the next 7 days), consider antenatal steroids between 24-34 weeks gestation.

- ACOG now states: “It is reasonable to extend this to 23 weeks, regardless of fetal number, if at risk for delivery within 7 days. This is a complex decision based on family wishes of resuscitation.”

Magnesium for neuroprotection < 32 weeks, per hospital protocol with careful attention to fluid status.[2]

Appendix A | Fetal Surveillance in Multifetal Pregnancy: Ultrasound Assessment & Antenatal Testing

First trimester:

- Determine chorionicity (lambda sign/T sign)[8]
    - Assign fetal identification
        - Identify Twin A as the one whose gestational sac most closely approximates the internal cervical os
        - Include location in uterus (ex: maternal left upper quadrant); gender as able
    - Determine chorionicity
        - If chorionicity is unclear, consider referral to High Risk OB/MFM
        - If chorionicity remains unclear, manage as monochorionic
- Establish EGA
    - Embryo transfer dating for IVF twins
    - Spontaneous twins
        - Use LMP
    - Confirmation by US at 10-14 weeks using CRL[22]
        - If conceived spontaneously, use the larger of the two CRLs
    - If > 14 weeks, use the larger head circumference[22]

18-20 weeks gestational age:

- Detailed anatomic evaluation (18-20 weeks EGA) in all twins
    - Add increased ultrasound surveillance in all MC twins once every two weeks, starting at 16 weeks
        - See Tables 1 & 2 on pages 11-12
    - Add fetal echocardiogram in monochorionic twins/conceived via IVF
    - Referral to Maternal Fetal Medicine for any suspected early growth abnormalities, or fetal malformations and all monochorionic twins

Serial ultrasound assessment for twin pregnancy based on chorionicity/risks:

- Serial assessment of fetal growth should include (after 14 weeks EGA) biometry of each fetus including minimum of BPD, HC, AC, and FL
- Recommend schedule of serial ultrasound following first trimester ultrasound:
    - Dichorionic twin pregnancy, tri-chorionic triplet pregnancy
    - 18-20-week detailed anatomic survey, consider MFM/HROB referral
    - Ultrasound for fetal growth and maximum vertical pocket of amniotic fluid volume every 3-4 weeks starting at 24 weeks of gestation
    - Referral to Maternal Fetal Medicine for discordance or FGR
- Monochorionic twin pregnancy:

    - Referral to MFM/HROB for consultation with provider/clinic with experience in care for multiple gestation
    - Ultrasound for fetal anatomy at 18-20 weeks gestation and fetal echo 18-26 weeks
    - Ultrasound for growth every 4 weeks and MVP every 2 weeks from 16 weeks gestational age
        - Consider UA and MCA Dopplers as indicated around 26-28 weeks
- Monochorionic/monoamniotic twins (or twins in setting of a higher-order multiples):
    - Referral to MFM with frequent growth/assessment via ultrasound
    - Recommend consultation with a neonatologist to help patient determine start date for monitoring and antenatal steroids
    - Intensive outpatient or inpatient antenatal testing starting at 23-28 weeks
        - Initiation of gestational age of antenatal testing should be individualized in consultation with maternal fetal medicine
- Triplet pregnancy:
    - Weekly antenatal testing at 30-32 weeks on an individualized basis

Note:

- Fetal growth restriction is defined as EFW < 10th percentile for gestational age
- Fetal growth discordance is defined as a difference in EFW > 20%, even in the setting of both individual fetuses with EFW > 10th percentile
- Assessment of amniotic fluid each sac with a single maximum vertical pocket (MVP):
    - MVP < 2 cm defines oligohydramnios
    - MVP > 8 cm defines polyhydramnios
- Fetal vascular or uterine Doppler assessment as a screening test in unselected twin pregnancy is not recommended
- The presence of abnormal amniotic fluid, fetal growth discordance, and/or fetal growth restriction should prompt immediate referral to HROB/MFM and individualized follow up fetal testing and ultrasound monitoring
- Specific management of complicated monochorionic twin pregnancy is beyond the scope of these recommendations

Appendix A, Table 1: Fetal Surveillance Schedule in Dichorionic Twin Pregnancy	
11-14 weeks gestation	• Date, Assign A/B • Chorionicity • Offer T21 Screening
18-20 weeks gestation	• Detailed anatomy per AIUM guidelines • Biometry/MVPs
24-36 weeks gestation	• Assess growth and MVPs approximately every 4 weeks

Appendix A, Table 2: Fetal Surveillance Schedule in Monochorionic Twin Pregnancy	
11-14 weeks gestation	• Date, Assign A/B • Chorionicity • Offer T21 Screening
16-36 weeks gestation	• Fetal growth every 4 weeks (or more frequently as indicated) • MVPs every 2 weeks (or more frequently as indicated to r/o TTTS) • Dopplers as indicated per MFM recommendations
18-20 weeks gestation	• Detailed anatomy per AIUM guidelines
18-26 weeks gestation	• Fetal echocardiograms
At 26-28 weeks gestation	• Consider adding Dopplers (UA and MCA) per MFM recommendations to screen for TAPS

Appendix B | Screening/Diagnostic Options with Twins

Screening/diagnostic options with twins:

- All twin gestations should be offered screening
- The screening and diagnostic options in twins require in-depth assessment and counseling
- The decision to proceed with screening is more complex because women must consider a different set of options if only one of the fetuses is affected
    - The use of biochemical screen versus cell free DNA (cfDNA) is rapidly changing, so consider referral to genetic counselor/MFM[13]
- The previously thought increased risk of aneuploidy in twins has been questioned by several studies
    - The observed incidence of aneuploidy/Trisomy 21 (T21) is actually less than expected (most notably for monozygotic twin pregnancies with increasing maternal age)[14]
- The data for screening for T21 is limited, but supportive to offer screening for T21, but not to use serum screening for Trisomy 13 /Trisomy 18 detection
    - Thus, a detailed anatomy screen utilizing AIUM criteria is important
- For higher order multiples, there is not enough data to recommend biochemical screening or cfDNA and therefore, neither is recommended[13]

General population risk:

- Use the Perinatology Risk Calculator: Theoretical Age-Related Risk of Chromosome Abnormality in Multiple Gestation
    - If “high risk,” see high risk population below
- Consider biochemical serum screening/Nuchal Translucency at 11-14 weeks
    - MC twins with NT >95 percentile are at risk for Twin-to-Twin Transfusion Syndrome (38% PPV)

High risk population (AMA, prior child with aneuploidy, ultrasound findings, or serum positive or high risk by risk calculator):

- Use the Perinatology Risk Calculator: Theoretical Age-Related Risk of Chromosome Abnormality in Multiple Gestation
- Patient may consider cfDNA or diagnostic testing
- Maternal Serum Screening is not reliable within 4-6 weeks of spontaneous loss of one twin or following multifetal pregnancy reduction

Appendix C | Maternal Nutrition/Micronutrient Supplementation in Multifetal Pregnancy[3,4]

Calorie requirement: Add approximately 250 calories per day per fetus to daily recommended caloric intake (Level 3).

- 30-50 calories/kg/day, divided into 3 meals and 3 snacks daily
- Assessment of maternal weight gain at each prenatal visit and alteration of caloric intake based on BMI-specific weight gain recommendations

Diet composition recommendations:

- Protein: 20% of calories
- Fats: 40% of calories
- Carbohydrates: 40% of calories

Micronutrient supplementation considerations (Level 2.3).

- Daily prenatal vitamin with folic acid for all multifetal pregnancies during pregnancy and lactation (Level 2.3)
- Add micronutrients below (diet and/or supplement):
    - Iron supplementation: additional 30 mg elemental iron daily (Level 2)
        - Multifetal pregnancy is associated with higher rates of maternal iron deficiency; iron deficiency is associated with low birth weight
        - Effect of supplementation in a population without nutrient deficiency remains unproven
    - Omega 3FA/fish consumption (Level 3)
        - 2-3 servings of low-mercury fish weekly
    - Folic acid: 1 mg daily
    - Calcium 1,500 – 2,500 mg daily (diet + supplement)
    - Vitamin D 1000 IU daily (diet + supplement)

Appendix D | Preterm Birth Prevention for Multifetal Pregnancy[2,6]

17P for multifetal pregnancy is not indicated (Level 1).[15,16]

- 17P may be indicated in setting of current twins with prior spontaneous preterm birth (Level 3)

Elective cerclage or cervical pessary for unselected multifetal pregnancy is not indicated (Level 2).

Home uterine activity monitoring is not indicated (Level 2).

Planned home or inpatient bedrest or activity restrictions are not indicated (Level 3).

Oral 'prophylactic' or 'maintenance' tocolytics are not indicated.

Antenatal corticosteroids should be reserved for the setting of acute risk for preterm birth with high risk of delivery within 7-10 days (Level 3).

Universal transvaginal cervical length screening in unselected multifetal pregnancy (18-24 weeks in asymptomatic twin pregnancy) is not recommended 2.

Mid-trimester decreased cervical length in twins is associated with PTB risk:

- TVCL at 24 weeks ≤ 25 mm associated with PTB risk in twins of 26.9% <32 weeks, 53.9%< 35 weeks, 73.1% < 37 weeks (MFMU PTB prediction) (Level 2.3)
- Management suggestions for asymptomatic, incidental vaginal ultrasound (short cervix ≤ 25 mm prior to 24-26 weeks EGA) in twins:
    - Strongly consider referral to MFM: A short cervix (<25 mm in twins) has only a 40% sensitivity for PTB and therapy should be individualized based on current data and clinical findings/history
    - Vaginal progesterone: Small reduction in PTB < 34 weeks, but a significant reduction in some key secondary outcomes (VLBW, mechanical ventilation)[23]
    - Cervical cerclage: With an isolated short cervix has been prospectively studied in only a small number of twins, thus more information is needed, and consideration should be individualized[17,18]
    - Arabin-type cervical pessary has mixed results in RCT; thus, it is unclear if beneficial
    - 17P does not prevent PTB in twins in setting of mid-trimester short cervix (Level 2.1)

- Increased clinical observation (Level 3), frequent provider visits
- Consider referral to MFM/HROB in a twin pregnancy with short cervix

For asymptomatic women, neither serial FFN nor digital exam is recommended (Level 3).

- FFN and /or transvaginal cervical length may be used in symptomatic patients to assist in exclusion of the diagnosis of preterm labor

There is some data that if dilated > 1cm between 16-24 weeks, cerclage (with indomethacin and antibiotics) can significantly prolong the latency period from diagnosis to delivery by 6-7 weeks.

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