

Multiple Pregnancy

Recommendation of Practice

Background

- The first NZ MFM Network monochorionic (MC) pregnancy guideline was developed in 2009 to coincide with the introduction of the Selective Fetoscopic Laser Photocoagulation for Twin to Twin Transfusion Service in New Zealand. The aim was to provide a basic ultrasound guideline to allow for early detection of complications of MC placentation and promote early referral to secondary and tertiary services.
- Since the development of the first guideline there have been a number of areas of new knowledge which are now incorporated into this guideline.
- Twin pregnancy occurs in approximately 2% of pregnancies and the rate is increasing. This is thought to be due to increasing maternal age and increasing use of assisted reproductive technologies which are both known risk factors for multiple birth. 1/3 of twin pregnancies are higher risk by virtue of having a single shared placenta (MC placenta).
- At term, the cumulative loss rate for Dichorionic (DC) twins is approximately 2%. For MC twins it is 8%. This means that of all MC twins identified early in the first trimester, only 92% of them will result in twin livebirths.
- All twin pregnancies have increased rates of structural differences, preterm birth (spontaneous and iatrogenic), pre-eclampsia selective fetal growth restriction (sFGR), gestational diabetes mellitus (GDM) and complicated delivery.
- The excess rate of losses in MC twins is secondary to the unique placental configuration and higher rate of structural differences.
- 10-15% of MC twins will develop Twin to Twin Transfusion Syndrome (TTTS). This most commonly occurs between 16-26 weeks gestation and if untreated has a perinatal mortality rate of 80-90%. In this situation, one twin receives more blood flow than the other by virtue of unidirectional flow along connecting vessels. This diagnosis carries an extremely poor prognosis and it can be responsible for up to 20% of all perinatal deaths in twins. The initial finding is of discordant amniotic fluid volumes.
- Twin Anaemia Polycythaemia syndrome (TAPS) is part of the spectrum of conditions attributable to vascular anastomoses on the placenta. TAPS usually occurs later in pregnancy and has a more favourable prognosis. It is defined by one twin being anaemic and the other polycythaemic without the discordant amniotic fluid associated with TTTS.
- sFGR is also a common complication of a MC twin pregnancy. It is secondary to unequal sharing of the placental mass and if it occurs early can have a poor outcome. It often occurs in combination with TTTS making diagnosis and treatment planning difficult.

- Demise of one twin can have a significant effect on the sibling:

| Risks for co-twin after demise of one twin after 14 weeks gestation | | |
|---|-------------------------|-------------------------|
| | DCDA twins % (95% C.I.) | MCPA twins % (95% C.I.) |
| Co-twin death | 4 (2-7) | 12 (7-18) |
| Neurologic abnormality | 1 (0-7) | 18 (11-26) |
| Preterm birth (< 37 weeks) | 57 (34-77) | 68 (56-78) |

- Rarer complications of MC twins include monoamniotic twins, the Twin-Reverse Arterial Perfusion (TRAP) sequence and conjoined twins.
- In many areas there is no high quality evidence to guide pregnancy care. In this situation a pragmatic approach, which is aimed to be accessible throughout New Zealand, is adopted.

Objective

To provide a nationally consistent approach with respect to ultrasound provision and diagnosis in women with multiple pregnancy.

Definition

- Multiple pregnancy is where there is more than one fetus. Monochorionic twins share a placenta which can contain vascular connections between the two parts of the placenta. Dichorionic twins have their own individual placenta.

Important History

- Dichorionic twinning is more common where there is a family history.
- Monochorionic twin pregnancy is more common where assisted reproductive technology has been used.

Ultrasound: all twins

Dating of a twin pregnancy

- For the purposes of dating use the largest CRL. Optimal dating of the pregnancy by CRL should be between 10+0 and 12+6 weeks gestation.
- From an HC > 80 mm (13+0 weeks) dating should be done using the mean of the HC if there is no previous dating scan. Fetal head circumference of the larger twin should be used to date the pregnancy after 14 weeks.
- If reproductive technology was used for conception use these dates.

Determining chorionicity

- The first scan if performed prior to 15 weeks will have nearly 100% accuracy in determining chorionicity.
 - Lambda sign (λ) indicates dichorionic diamniotic (DCDA) pregnancy: two separate placentae has specificity of 100%. But this sign can often only be used in the first trimester because placentas can fuse later in gestation. Fetuses with discordant gender are always dizygous and therefore dichorionic. Tau sign (τ) sensitivity of 100% and specificity 98%. The thickness of membranes less than

1.5 mm or empty Lambda sign indicates monochorionic diamniotic (MCDA) pregnancy. Absence of membranes indicates monochorionic monoamniotic (MCMA) pregnancy.

- It is standard practice for ultrasonographers to comment on chorionicity at the time of an early scan. The images of the determination of chorionicity should be available for future reference.
- If a scan <15 weeks confirms a twin pregnancy but does not clearly state chorionicity it should be repeated or reviewed by a tertiary referral centre.
- If MCMA twinning is suspected a transvaginal scan should be offered to the woman if available as this will provide a more definite diagnosis.
- If there is a co-twin demise in the first trimester in a MC twin pregnancy, there should be a follow-up USS in 2-3 weeks to examine the demised twin with colour Doppler to ensure there is not an evolving Twin Reverse Arterial Perfusion (TRAP) Sequence present.

Labelling of twin

- It is advisable to describe each twin using as many features as possible (gender discordance, site, according to insertion of the cord or membranes).

11-14 weeks scan

- Nuchal Translucency (NT) is as accurate in twin pregnancies as in singletons and can provide individual risk of aneuploidy to each fetus. In DC twins each NT is combined with serum analytes to give individual risks of aneuploidy. In MC twins the NT is averaged and combined with serum analytes to give the same risk for both fetuses.
- In triplet and higher order pregnancies aneuploidy risk is determined by the 11-14 week scan (NT) alone.
- NIPT is suitable for twin and triplet pregnancies in most situations. It is not suitable for higher order multiples. In the case of co-twin demise NIPT timing should be discussed with the NIPT provider.
- In the case of NIPT for screening the NT scan should become an extended early anatomy scan.
- Discordant CRL in MC twins is associated with an increased risk of sFGR.

Prenatal Diagnosis

- Results of prenatal screening need careful review and interpretation when high risk for aneuploidy.
- When an invasive procedure is planned, where possible, this should be performed by a practitioner who is trained in and will be available to perform a fetal reduction if required. Sampling errors and mosaicism (mixing) has been reported in transabdominal CVS in 6-12% of cases. It is less frequent with amniocentesis with careful visualisation of the membranes.
- A discordant karyotype in MC twin pregnancies has been reported, for Down Syndrome as well as for Turner Syndrome. Even though this is rare, in MC twin pregnancy with discordant phenotype sampling of both fetuses should be advised.
- Some studies report no increased risk of miscarriage when sampling both twins, other studies report increased risk, up to double the risk in singletons.

Suggested scanning guidelines: All twins

- Dating scan (with determination of chorionicity).
- Nuchal translucency or early anatomy scan.

Suggested scanning guidelines: Dichorionic Twins

- Anatomy scan at 20 weeks.
- Biometry scans every 4 weeks with the addition of Umbilical artery Dopplers if SGA. If SGA in either twin growth scans need to be performed every fortnight, and in case of abnormal Umbilical artery Doppler, scanning frequency should be increased to twice weekly.
- After 32 weeks scanning can be guided by the Small-for-Gestational-Age-and-Fetal-Growth-Restriction-in-NZ-Clinical-Practice-Guideline-Summary-of-recommendations.pdf. [link to guideline.](#)
- If there is severely early-onset discordant growth at a preterm gestation the decision can be made with the parents to refrain from intervention in case of fetal distress in the growth restricted fetus with the intention of a palliative care approach. This management needs to be individualised in consultation with the neonatologists. Counselling of the parents should be undertaken by both neonatologist and the MFM subspecialist. If this approach is adopted then consideration should be given to referral to a perinatal palliative care specialist. It should be taken into consideration that active management for the smaller twin may have severe negative consequences for the well-grown co-twin because of iatrogenic prematurity.

Suggested scanning guidelines: Monochorionic Twins

- Anatomy scan at 20 weeks.
- Fortnightly scans from 16 weeks gestation to include:
 - Biometry, amniotic fluid (deepest vertical pool), presence/absence bladder and stomach filling.
- From 20 weeks Umbilical artery Doppler and MCA-PSV where possible to obtain.
- In the case of fetal demise of one fetus there is a significant risk of ischemic brain damage in the surviving co-twin. Consideration should be given to an MRI six weeks after the event or longer depending on the gestation. At the time of diagnosis the ischaemic damage has already occurred. Immediate delivery is not recommended. Consideration should be given to gestational age of the surviving twin and MRI findings.

Diagnosis of TTTS (screening should start at 16 weeks)

- Quintero staging based on discordancy of amniotic fluid
 - Stage 1
 - <20 weeks Twin1 DVP <2cm, Twin 2 DVP > 8cm
 - >20 weeks Twin 1 DVP <2cm, Twin 2 DVP > 10cm
 - Stage 2 Absent Bladder and Oligohydramnios twin 1 over 60 minutes of observation
 - Stage 3 Critical Dopplers in either twin
 - Critical Dopplers = Absent or reversed Umbilical artery end diastolic velocity, reversed Ductus Venosus a-wave, pulsatile umbilical vein flow.
 - Stage 4 Ascites or hydrops in either twin
 - Stage 5 Fetal demise in one or both twins.

Diagnosis of TAPS

- Stage 1 Delta MoM>0.5 (old definition MoM>1.5 and <1.0)
- Stage 2 Delta MoM>0.7 (old definition MoM>1.7 and <0.8)
- Stage 3 Absent/reversed Umbilical artery end-diastolic Doppler, reversed A wave DV, pulsatile UV in either twin
- Stage 4 Hydrops
- Stage 5 Demise of either twin preceded by TAPS.

- <http://www.perinatology.com/calculators/MCA.htm> provides an online calculator.
- [MCA Peak Systolic Velocity — Monochorionic Twins \(A/B\) — Perinatology.com.](#)
- Other features:
 - Discordant placental echotexture
 - Recipient 'starry sky' appearance of the liver.
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Diagnosis of sFGR

- EFW discordancy of >25% OR
- EFW of one twin < 10th centile
- Gratacos Staging:
 - Type 1: Positive end diastolic flow in the umbilical artery
 - Type 2: Absent or reversed end diastolic flow constantly observed during all the examination
 - Type 3: Intermittent absent or reversed end diastolic flow alternating over short periods of positive diastolic flow (cycling) in the absence of fetal or maternal breathing.

Twin reversed arterial perfusion (TRAP) sequence

- Also known as acardiac twinning.
- Rare, occurring in 1 percent of MC twin pregnancies.
- One twin is usually structurally normal (the 'pump twin'); the other ('acardiac twin') is abnormal, often consisting of a lower body and lower limbs with absent or rudimentary upper body, head and heart.
- Due to abnormal vascular connections between the twins with arterial flow from the umbilical artery of the pump twin into the acardiac twin – illustrated on colour Doppler or pulsed wave ultrasound as reversed arterial perfusion within the abnormal twin.
- The pump/normal twin may develop high output cardiac failure.
 - The assessment of the risk to the pump twin is primarily done by calculating the size and weight of the acardiac twin to determine the risk of high-output cardiac failure
 - acardiac twin weight / pump twin weight ratio >0.5 indicates a 50% chance of adverse outcome, a ratio>0.7 indicates >90% risk of adverse outcome and intervention is warranted.
 - Abdominal circumference ratio maybe a simpler method than weight ratio.
 - AC TRAP / AC PUMP >50%. Indicates a high risk of adverse outcome.
- Untreated, mortality of the normal/pump twin approaches 50 percent.

When to refer: All twins

- Te Whatu Ora Guidelines for Consultation with Obstetric and related medical service: click [link](#) Codes 4018 and 4037 recommend that women with a multiple pregnancy should have their care transferred to a Specialist Obstetrician, though in many cases care is shared with a midwifery LMC.
- A specialist with an interest in high risk pregnancy should be involved in the following situations:
 - High risk first trimester screening or anomaly on anatomy scan
 - Amniotic fluid discordancy
 - Growth discordancy of >20% EFW.
- Where there is a possible diagnosis of TTTS early referral within 24 hours to the regional Fetal Medicine Hub is recommended for urgent assessment. This condition can deteriorate quickly and treatment for severe cases is available only in Auckland.

This Recommendation of Practice was updated in March 2026 by Dr Emma Ellis with input from members of Wāhi Rua NZMFM Network.

References

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