

Management of Twin Pregnancies (Part 1)

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INTRODUCTION

The incidence of twin gestations across Canada has increased by 15 percent over the years 1993-1997. This increase is the major contributing factor to the rising incidence of preterm birth in Canada.¹ Many aspects of the obstetric management of the twin pregnancy cannot be extrapolated from that of a singleton pregnancy. For example, the age related karyotypic risk is different for a twin compared to a singleton pregnancy;² during pregnancy the clinical assessment of the growth of each fetus is difficult without ultrasound; and finally, the delivery of the second twin demands special attention. Therefore in December 1997, the SOGC and the Universities of Toronto and Western Ontario* coordinated a National Consensus Conference in order to define, based upon the best evidence available, the standard care of twin and higher order multiples gestation.

PROCESS

Five priority areas were identified and questions relating to those areas developed in order to allow participants to concentrate on important guidelines for practice. The impact of the increase in multiple births was also addressed. The participants were divided into groups to address each of these topics. Each group had in charge a leader or leaders whose task it was to review the literature and provide evidence based answers and forward the group's consensus on particular issues. The quality of evidence was evaluated and recommendations were

made according to guidelines for assessing medical literature published by Health Canada (Table I).³ As an aid to the reader, alongside each recommendation is the Level of Evidence and Category of Strength for that recommendation. Although many areas of practice have not been well studied, clinical practice dictates that some recommendations of practice are made to aid professionals in their day to day clinical activity. It is important to realize that these particular recommendations are made not on "best evidence" but on "best opinion" and should be flagged as areas for future research. The full deliberations of each group will be available on the SOGC "Multiples" Website and in a more complete publication which will be available in the future.

It was attempted to keep medical representation at the meeting wide, with input sought from all aspects of health care including midwifery, nursing, counselling, social work, as well as community groups. We are totally indebted to the group facilitators who reviewed and presented vast amounts of literature and who have allowed us to present this consensus document.

A. THE INCIDENCE AND IMPACT OF TWIN PREGNANCIES

Multiple births have increased from 1.9 percent to 2.1 percent of all live births between 1981 through 1983 and 1992 through 1994. The contribution of these multiple pregnancies to preterm birth rates in Canada has resulted in a 25 percent increase in the proportion of preterm births resulting from multiple gestations.¹ The impact of this data on both our health care system and on Canadian society, along with the

TABLE 1 ³ QUALITY OF EVIDENCE ASSESSMENT	CLASSIFICATION OF RECOMMENDATIONS
<p>The quality of evidence reported in these guidelines has been described using the Evaluation of Evidence criteria outlined in the Report of the Canadian Task Force on the Periodic Health Exam.³</p> <p>I: Evidence obtained from at least one properly randomized controlled trial.</p> <p>II-1: Evidence from well-designed controlled trials without randomization.</p> <p>II-2: Evidence from well-designed cohort (prospective or retrospective) or case-control studies, preferably from more than one centre or research group.</p> <p>II-3: Evidence obtained from comparisons between times or places with or without the intervention. Dramatic results in uncontrolled experiments (such as the results of treatment with penicillin in the 1940's) could also be included in this category.</p> <p>III: Opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees.</p>	<p>Recommendations included in these guidelines have been adapted from the ranking method described in the Classification of Recommendations found in the Report of the Canadian Task Force on the Periodic Health Exam.³</p> <p>A. There is good evidence to support the recommendation that the condition be specifically considered in a periodic health examination.</p> <p>B. There is fair evidence to support the recommendation that the condition be specifically considered in a periodic health examination.</p> <p>C. There is poor evidence regarding the inclusion or exclusion of the condition in a periodic health examination, but recommendations may be made on other grounds.</p> <p>D. There is fair evidence to support the recommendation that the condition not be considered in a periodic health examination.</p> <p>E. There is good evidence to support the recommendation that the condition be excluded from consideration in a periodic health examination.</p>

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recommendations of the subgroup that addressed these issues, will be published in the August issue of *Journal SOGC*.

B. RECOMMENDATIONS FOR EARLY PREGNANCY ULTRASOUND AND GENETIC COUNSELLING.

1) The first trimester ultrasound in twin pregnancy?

Chorionicity, one of the most important determinants of pregnancy outcome in twin gestation, is best determined in the first trimester. Nuchal translucency can also be measured.

CONSENSUS STATEMENT #1

When a multiple gestation has been diagnosed:

- Every effort should be made to determine chorionicity at the time of diagnosis. (II-3 C)
- The optimal time to determine chorionicity is 10-14 weeks. (II-3 C)
- While these recommendations apply to diagnosis of twin pregnancy with regard to prenatal diagnosis and counselling, there have been no studies relating the establishment of prenatal chorionicity to pregnancy outcome.

2) At what age should genetic testing be offered to a mother with dichorionic and monochorionic twins?

Invasive diagnostic testing may be offered in twins on the basis of late maternal age. When counselling women about their risk of chromosome abnormalities, the chorionicity should be taken into consideration. In monochorionic (MC) twins, the age-related risk for the fetuses is the same (all are monozygotic) and is equivalent to the risk in a singleton pregnancy. In dichorionic (DC) twins, the risk is essentially double the age-related risk (about 2/3 will be dizygotic). Although accurate determination of chorionicity by ultrasound is possible, it will not always be feasible. Hence, the group felt it was more appropriate at this time to follow the guidelines by Rodis *et al.* (1990) which state: "The chance of a 32 year old woman who carries twins of unknown zygosity having at least one child with Down syndrome is equivalent to the risks of a 35 year old with a singleton pregnancy."²

The risk of amniocentesis in twin gestation is uncertain (see below) and issues such as discordant anomalies that may arise need to be considered. Such counselling is complicated and is best carried in a specialized genetic centre, or centre specializing in the management of multiple gestation.

CONSENSUS STATEMENT #2

All women carrying twin pregnancies should be referred for counselling to a centre for the consideration of invasive testing at age 32. The counselling must be individualized and the final decision must be taken by the parents since the risk of amniocentesis is uncertain in twin gestation. (II-3 C)

3) What are the methods available for genetic screening in twin pregnancies and how effective are they in twin pregnancies in detecting fetal aneuploidy?

CONSENSUS STATEMENT #3

- Biochemical screening for aneuploidy is not recommended in twins.
- Maternal serum alpha fetoprotein (MS-AFP) is useful for detection of open neural tube and other birth defects. (II-3 C)
- Evidence is promising that nuchal translucency (NT) screening is useful for identifying twin pregnancies at high risk of aneuploidy. This requires further prospective investigation. (II-3 C)

4) What are the risks/benefits of invasive genetic testing in twin pregnancy?

CONSENSUS STATEMENT #4

- The fetal loss rates with invasive testing (amniocentesis and chorionic villus sampling (CVS)) in twins are unclear. (II-3 C)
- Development of a protocol for standardization of technique (as determined by expert opinion) is recommended.
- Invasive testing should be offered to twins according to the usual standard of care.

CONSENSUS STATEMENT #5

- In twins discordant for abnormality, the option of selective reduction should be offered. The procedure should be performed in a tertiary level center. Transportation and out-of-province costs should be covered.

C. PRETERM BIRTH PREVENTION IN TWIN GESTATION.

The use of tocolytics and corticosteroids in the treatment of established preterm labour was not addressed at this meeting. Readers are directed to *The Canadian Consensus on the Use of Tocolytics for Pre-Term Labour*.⁴

1) Is there any evidence that bedrest, cervical suture or tocolysis, or any other intervention prevents preterm labour and delivery in twin pregnancies?

HOSPITAL BEDREST

Randomized controlled trials and a meta-analysis of hospital bedrest in twin pregnancies have shown no reduction in preterm birth or perinatal death.⁵⁻¹² In uncomplicated twin pregnancies, hospital rest may result in increased risk of very preterm birth and maternal psychosocial stress. In women with twin pregnancy at high risk for preterm birth because of premature cervical change prior to labour, there is no evidence that hospital bedrest will reduce the rate of preterm birth.

CONSENSUS STATEMENT #6

Routine hospitalization for bedrest in multiple gestation is *not* recommended. (I E)

ACTIVITY RESTRICTION/WORK LEAVE

Restriction of activity level and the recommendation to stop work is commonly prescribed for women with twin pregnancies as a preterm birth prevention strategy. This prophylactic intervention has only been studied in a few observational trials with historical or geographic controls with conflicting results.^{13,14}

CONSENSUS STATEMENT #7

There is insufficient evidence to support prophylactic activity restriction or work leave in multiple gestation. (III C)

CERVICAL CERCLAGE

Prophylactic cervical cerclage has not been shown to be effective in preventing preterm birth in twin pregnancy in observational or controlled trials.¹⁵

CONSENSUS STATEMENT #8

There is moderate evidence against routine prophylactic cervical cerclage in multiple gestation. However, cerclage may be indicated for the treatment of incompetent cervix or other specific circumstances. (I;II-2 D)

PROPHYLACTIC TOCOLYTIC THERAPY

Most randomized controlled trials have failed to show any benefit of prophylactic oral or intravenous tocolytic therapy in multiple gestation.¹⁶⁻²⁰

CONSENSUS STATEMENT #9

There is moderate evidence against prophylactic tocolysis in the management of multiple gestation, but it may be indicated on other grounds. (I;II-2 D)

SPECIALIZED TWIN CLINICS/PREVENTION PROGRAMMES

Multi-intervention preterm birth prevention programmes for twin pregnancies have been evaluated in several observational studies with contemporary and/or historical controls.²⁰⁻²⁶ All studies reviewed suggest reduction in preterm birth rate, decreased perinatal mortality, and overall improvement in perinatal outcome.

CONSENSUS STATEMENT #10

The evidence to support specialized clinics is of insufficient quality to recommend that they be part of routine clinical practice. Further randomized controlled studies are needed to validate the improved outcomes that have been

demonstrated in cohort studies. (II-2;III C)

2) Is there a role for routine clinical cervical assessment in multiple gestation?

Despite the lack of precision, clinical cervical assessment appears to be safe and may be effective in monitoring twin gestations, if transvaginal ultrasound is not available or determined to be too expensive.²⁷ However, compared to transvaginal sonography, digital examination is more subjective and less reproducible.²⁸⁻³⁰

CONSENSUS STATEMENT #11

There is good evidence that premature cervical change by digital examination predicts preterm birth in twins. (II-2 A) Since there are no well designed intervention trials available, the role of sonographic clinical cervical assessment in the prenatal period has not been determined. (C)

3) Is there a role for sonographic cervical assessment in multiple gestation?

Transvaginal sonographic cervical assessment provides insight into the cervical status, as well as the likelihood of preterm birth in twin pregnancies. There appears to be good correlation between cervical length and the risk of preterm birth.³¹⁻³⁵

CONSENSUS STATEMENT #12

There is good evidence that transvaginal sonographic measurement of cervical length predicts preterm birth in twins. (II-1 A) While the predictive ability of cervical length measurement is established, there are no intervention studies that have evaluated cervical length measurement in the prevention of preterm birth, and therefore the role of sonographic clinical cervical assessment in the prenatal period has not been determined. (C)

4) Is home uterine activity monitoring useful in predicting preterm birth in twin pregnancy?

Although home uterine activity monitoring may be helpful in identifying women at increased risk of preterm labour before advanced cervical dilation occurs, this information has not resulted in reduction in the incidence of preterm labour, advanced cervical dilation at presentation or preterm birth in well-controlled randomized controlled trials.³⁶⁻⁴⁰

CONSENSUS STATEMENT #13

There is moderate evidence against home uterine activity monitoring in multiple gestation. (I D)

5) Does the measurement of fetal fibronectin predict preterm birth in twin pregnancy?

Data from prospective longitudinal studies suggests that a positive fetal fibronectin test has a very high negative predictive value for the prediction of preterm birth in asymptomatic

patients. The positive predictive value for preterm labour and delivery before 37 weeks is 60 percent for patients in preterm labour, 45 percent in asymptomatic high-risk women, and 30 percent in asymptomatic low-risk women.⁴¹

CONSENSUS STATEMENT #14

There is good evidence that the presence of cervicovaginal fetal fibronectin in twins predicts preterm birth. Without well designed intervention trials available, there is no basis for incorporating fetal fibronectin screening into routine prenatal management of multiple gestation. (C)

SUMMARY

No prenatal method has been shown to prevent preterm birth labour and birth in twin pregnancies. Cervical length measurement and presence of fetal fibronectin in cervico-vaginal fluids need to be evaluated to investigate whether the ability to predict whether selected interventions, applied to a subgroup of twins with a high risk of preterm birth, will result in a reduction in the rate of preterm birth.

D. ULTRASOUND IN TWIN GESTATIONS⁴²⁻⁶⁹

1) When should ultrasounds be performed in twin pregnancies and why?

Without ultrasound, up to 40 percent of twin gestations will not be recognized until 26 weeks gestation on average, and up to 20 percent will remain unrecognized until term. In the first or second trimester ultrasound will usually (>95%) determine chorionicity. The detection of fetal anomaly, the incidence of which is three times higher with twin pregnancy, is initially best assessed between 16 and 20 weeks. In the second and third trimesters, fetal growth will be reliably assessed by serial ultrasound.

CONSENSUS STATEMENT #15

There is good evidence that the diagnosis of twin gestation is improved by the routine use of ultrasound. There is consensus that serial ultrasonographic evaluation every three to four weeks is indicated in twin gestations. (I B)

2) Is fetal growth the same in twins as in singletons and what ultrasonic growth curves should be used to plot fetal weights?

Fetal growth in twin gestation parallels that of singletons until approximately 32-35 weeks. Thereafter the rate of fetal growth is measurably slightly less, although the clinical significance of this is undetermined. The patterns of twin fetal growth vary by race and gender, with African-American mothers having lower median body weight (BW) values. Male twins have heavier median BW for gestational age than female twins at every gestational age.

CONSENSUS STATEMENT #16

Fetal growth differs slightly in twin gestations and twin specific charts may be used to define the normal growth rate. Precision may also be obtained by using sex and race specific charts. In clinical practice, however, these differences are small and singleton growth curves may be used. Patterns of fetal growth are more important than absolute measurements. Both must be interpreted in the light of the clinical history, together with all the genetic and environmental factors that may affect fetal growth. (III B)

3) What level of growth discrepancy between twins is cause for concern?

The importance of accurate and timely identification of discordant growth lies primarily in its relationship to the complication of twin twin transfusion and to intra-uterine growth restriction (IUGR) of the smaller twin. True discordance is an indicator for an increased risk of IUGR, morbidity, and mortality for the smaller twin. A risk for aneuploidy, anomaly or viral syndrome affecting only one fetus must also be considered when discordant growth is identified.

CONSENSUS STATEMENT #17

The diagnosis of discordance has been based on the following:

- an abdominal circumference (AC) difference of 20 mm (sensitivity of 80%, specificity 85%, positive predictive value (PPV) 62%)
- estimated fetal weight (EFW) based on bi-parietal diameter (BPD) and AC or AC and femur length (FL) > 20 percent (sensitivity 25-55%) (II-2 B)

E. LABOUR MANAGEMENT AND THE DELIVERY IN TWIN GESTATION

1) What are the indications for elective Caesarean in twin pregnancies (> 2,500g)?

CONSENSUS STATEMENT #18

The indications for elective Caesarean section in twin gestations are:

- a) **Monoamniotic twins** because the risk of entrapment is too great to permit elective vaginal delivery;
- b) **Conjoined twins** other than at gestations remote from term;
- c) Indications as for singleton pregnancies. (III C)

2) What are the attendance at labour and delivery guidelines for physicians managing a twin gestation?

CONSENSUS STATEMENT #19

The following points highlight the factors most crucial to

the successful care of a woman during labour and delivery of a twin pregnancy.

- a) Timely attendance by a physician competent to manage a twin birth.
- b) The presence of additional antenatal risk factors should be reviewed at the onset of labour. Intrapartum risk factors should be assessed on an ongoing basis and changes attended to appropriately.
- c) When participating in a call system, the replacing physician should be of similar competence and informed of all facts pertaining to a case when care is transferred.
- d) The diagnosis of twins is usually antenatal. Therefore, arrangements for delivery and/or transfer should be set in place. This may include antenatal consultation with a high risk centre.
- e) The assessment of lie and presentation of each fetus on admission in labour, preferably by ultrasound.
- f) Intravenous access should be secured, and blood sent for group and antibody screen.
- g) Anaesthetic personnel should be informed as soon as possible of a planned twin birth. Epidural anaesthesia is advantageous.
- h) Oxytocin augmentation may be used before the delivery of the first twin and/or between twins for hypotonic contractions.
- i) For either twin, the indication(s) for any intervention should be convincing, compelling, and documented at the time of the event(s). However, for the cephalic second twin, vaginal delivery should be expedited should fetal distress occur. There is little evidence to suggest the best operative method of delivering the second twin who remains in the vertex position, should the need arise. A vacuum or forceps procedure, preferably during which the prerequisites of any operative delivery are fulfilled, may be considered. However, the vacuum may be employed at a station perhaps slightly higher than would be attempted with a singleton fetus. Other options are conversion to breech and delivery by breech extraction if the Vx was not engaged or Caesarean if the operator felt that no other method could be safely accomplished.
- j) Documentation of all aspects of labour and delivery should be clear, contemporaneous, and consistent among all involved health care providers.
- k) Progress of labour should emerge clearly from the documentation.
- l) Continuous electronic fetal heart rate monitoring of both twin A and B should ensure that both twins are being monitored individually. The presence of an ultrasound machine in the delivery room may be advantageous.
- m) For attempted delivery by mid-forceps, vaginal breech delivery, and multiple pregnancies, Caesarean section should be available immediately. Immediate availability means the presence in the hospital of anaesthetic, obstetrical, neonatal, and nursing staff trained in Caesarean delivery. A note should be dictated describing all operative deliveries and complicated labour and delivery events. The time difference

between the delivery of each baby should be noted.

- n) Cord blood samples should be drawn at the time of delivery.
- o) The third stage of labour should be managed actively, with oxytocin being administered with the delivery of the second twin.
- p) Placentas should undergo gross and microscopic pathological examination.
- q) We suggest that twin deliveries be planned in Level II and Level III hospitals. (II C)

3) What is the best method of delivering the non vertex second twin?

CONSENSUS STATEMENT #20

- a) Delivery of cephalic twin A/non-cephalic twin B: Estimated weight 1,500-4,000 g. Vaginal delivery is indicated as long as the obstetrician is comfortable with and skilled in vaginal breech delivery.⁷⁰⁻⁸³ (II-2 B)
- b) Delivery of cephalic twin A/non-cephalic twin B: Estimated weight 500-1,500 g. In this weight range the group acknowledged that there is no consistent evidence to support either Caesarean section or the vaginal route for delivery.⁷⁰⁻⁷⁸ (III C)

4) Non-cephalic twin B: Breech extraction with or without internal podalic version OR external cephalic version?

CONSENSUS STATEMENT #21

Breech extraction with or without internal podalic version is associated with a lower Caesarean section rate and similar neonatal and maternal outcomes compared with external cephalic version in the twin pairs whose estimated fetal weights are greater than 1,500 g.⁷⁹⁻⁸⁴ (II-2 B)

5) What is the optimal delivery interval between twins in a vaginal twin delivery?

CONSENSUS STATEMENT #22

It is reasonable to either:

- a) expedite delivery by oxytocin infusion, stabilizing amniotomy and, if indicated, operative vaginal delivery; or
- b) permit a longer delay between deliveries using an oxytocin infusion and continuous electronic fetal heart rate monitoring. For the non-cephalic second twin, if breech extraction with or without podalic version is considered, then this should be done without delay.⁸⁵⁻⁸⁸ (II-2 B)

F. Special Twin Circumstances, Guidelines For Diagnosis And Management: Twin Twin Transfusion (TTTS), Monoamniotic Pregnancies.

1) What are the diagnostic markers of twin twin transfusion?

CONSENSUS STATEMENT #23

a) Evidence for diagnosis:⁸⁹⁻¹¹¹

- i) single monochorionic placenta,
- ii) polyhydramnios/oligohydramnios sequence, and
- iii) same sex fetuses.

This does not imply that all pregnancies characterized by these features are affected by TTTS—further investigations may be required—but these features should prompt referral to a tertiary care unit. (II-2 B)

b) Evidence of decompensation in fetal health. These include:

- i) chronically distended bladder of recipient twin;
- ii) growth discordance (>25%); and
- iii) evidence of cardiac dysfunction eg., non-immune hydrops.

These should prompt urgent referral to a tertiary care perinatal centre. (II-2 B)

2) How should TTTS pregnancies be managed antenatally and when should they be delivered?

CONSENSUS STATEMENT #24

In consideration of the high perinatal mortality rate accompanying a diagnosis of TTTS, all monochorionic twin pregnancies should be seen in consultation by a maternal-fetal medicine specialist for counselling and monitoring of fetal condition. Urgent consultation should be sought for the criteria listed in Section 23(b) above. (II-3 B)

a) Monitoring (uncomplicated monochorionic twin pregnancy):

Following diagnosis of uncomplicated monochorionic twin pregnancy and detailed second trimester anomaly screen, serial ultrasound surveillance of fetal health performed every two weeks, looking for evidence of suboptimal growth and/or emergence of features suggestive of TTTS. (III C)

b) Established TTTS:

The frequency of ultrasound surveillance of fetal health in severe cases of TTTS will depend on the severity and intervention strategy. (III C)

Therapeutic options: These include:

- i) no intervention (survival 0—30%),
- ii) amnioreduction 64 percent (survival 64% overall, 74% of at least one twin),
- iii) laser photocoagulation (55% overall survival—73% of at least one twin),
- iv) amniotic septostomy, 83 percent survival (12 cases only). Termination of pregnancy, either selective or total may be considered.¹¹²⁻¹³⁷

3) What are the diagnostic features and risks of monoamniotic twin gestation?

CONSENSUS STATEMENT #25

Monochorionic, monoamniotic placentation is found in approximately 1 percent of all twin gestations. High mortality rates (up to 50%) have been attributed to cord entanglement, knots and twists, congenital anomalies, and prematurity. Cord entanglement is present at birth in virtually 100 percent of monoamniotic twins and is a key diagnostic feature of monoamnioticity on sonography. Other sonographic diagnostic features of a monoamniotic twin pregnancy include:

- a) absence of a dividing amniotic membrane,
- b) presence of a single placenta,
- c) both fetuses of the same gender,
- d) adequate amniotic fluid surrounding each fetus, and
- e) both fetuses moving freely within the uterine cavity.¹³⁸⁻¹⁵⁶

4) How should they be managed antenatally and when should they be delivered?

CONSENSUS STATEMENT #26

These cases should all be referred to a regional perinatal centre. A reasonable management plan includes:

Antenatal:

- a) frequent (weekly or more) non stress test commencing at 24 weeks, (II-3)
- b) judicious use of antenatal corticosteroids. (III C)

Delivery:

- a) By 32 -33 weeks, although some evidence that later delivery may be appropriate, (II-3,2 C)
- b) Casearean delivery.^{145,150,153, 156} (II B)

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