



SOGC

CLINICAL PRACTICE GUIDELINES

POLICY STATEMENT*

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GUIDELINES FOR ULTRASOUND AS PART OF ROUTINE PRENATAL CARE

This Policy Statement has been reviewed and approved by the Diagnostic Imaging Committee of the Society of Obstetricians and Gynaecologists of Canada and was approved by its Council in March 1999

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GOALS

THESE GUIDELINES ARE INTENDED TO ASSIST HEALTH CARE PROFESSIONALS CARING FOR PREGNANT WOMEN TO:

- understand the evidence as to the advantages and disadvantages of routinely offering women prenatal ultrasound;
- determine the optimal gestational age for performing ultrasound in the context of routine prenatal care;
- help patients make an informed decision about having a second trimester prenatal ultrasound examination.

RECOMMENDATION

After appropriate discussion about the potential benefits, limitations and safety of the examination, women should be offered an ultrasound centred at 18 to 19 weeks gestation.

EXCLUSIONS

THESE GUIDELINES DO NOT APPLY TO THE USE OF ULTRASOUND FOR SELECTIVE INDICATIONS WHICH MAY INCLUDE:

- assessment in the first trimester;
- assessment of fetal well-being in the third trimester;
- assessment of fetal growth;
- investigation and monitoring of multiple gestations;
- investigation of suspected congenital anomalies;
- aid to invasive diagnostic or therapeutic procedures;
- investigation of size/date discrepancies;
- assessment of post-term pregnancy;
- investigation of fetal status in preterm labour or prelabour rupture of membranes.

BACKGROUND

Ultrasound has had an important influence on the practice of obstetrics by providing valuable information about many complications of pregnancy. There is good evidence to support the benefit of selective ultrasound use for high-risk pregnancies. There has been considerable debate about the value of ultrasound offered routinely for uncomplicated pregnancies. This topic has

been reviewed previously by both the Canadian Task Force on the Periodic Health Examination (1994) and the Society of Obstetricians and Gynaecologists of Canada (SOGC) (1995).^{1,2}

RESEARCH FINDINGS

The use of ultrasound in obstetrics increases the frequency with which major malformations are detected before birth.

Major structural malformations occur in two to three percent of all newborns; they account for 20 to 25 percent of all perinatal deaths and an even higher percentage of perinatal morbidity.³⁻⁵

The majority of anomalies occur in infants without a family history of congenital malformations.^{6,7} Identification of anomalies provides parents with the opportunity for early counselling, with the option of terminating a pregnancy when a severe defect is detected or preparing for post-natal intervention.⁸

The sensitivity of ultrasound carried out prior to 20 weeks gestation to detect anomalies ranges from 25 to 71 percent. Not all anomalies can be detected. The discrepancy is dependent on:^{3,8}

- the experience of the ultrasonographer/ultrasonologist;
- the availability of an ultrasonologist on site during examination;
- the quality of the equipment;
- the type of malformations.

The components of a complete second trimester ultrasound examination are outlined in the Journal of the SOGC (1995).² False-positive rates of 0.2 to 1.0/1,000 women scanned are reported. Most initial false-positive diagnoses are correctly identified as normal on follow-up evaluation.

If an anomaly is identified, the patient should be counselled, and consideration should be given to a prompt referral of the patient to a tertiary care centre for consultation.⁹



Overall, about 50 percent of all anatomic defects are detected by second trimester ultrasound examination.¹⁰

Meta-analysis of four randomized controlled trials of routine versus selective ultrasound scanning in pregnancy showed a reduction in perinatal mortality in the routine screening group (odds ratio = 0.64; 95% confidence interval 0.43 to 0.97).¹¹ Trials with high detection rates of congenital anomalies showed an increased rate of elective abortions which explains the number of perinatal deaths.

Studies do not provide evidence that *in utero* diagnosis of anomalies significantly improves the affected fetus' chance for survival. However, early detection of fetal anomalies may, in certain cases, improve outcomes by permitting delivery at tertiary care centres capable of immediate medical and surgical intervention.⁹

Qualitative evidence suggests that women may benefit psychologically or emotionally from advance knowledge of a defect discovered antenatally.¹¹

Timing of ultrasound to rule out anomalies should be at 18 weeks gestation (Algorithm A).

Ultrasound prior to 17 weeks gestation to rule out anomalies is not advised due to a high false-negative rate of detection.¹² At 18 to 19 weeks gestation, there is sufficient fetal development to facilitate detection of anomalies, while allowing time for additional information to be obtained and to be discussed with the patient (couple) to determine available options.

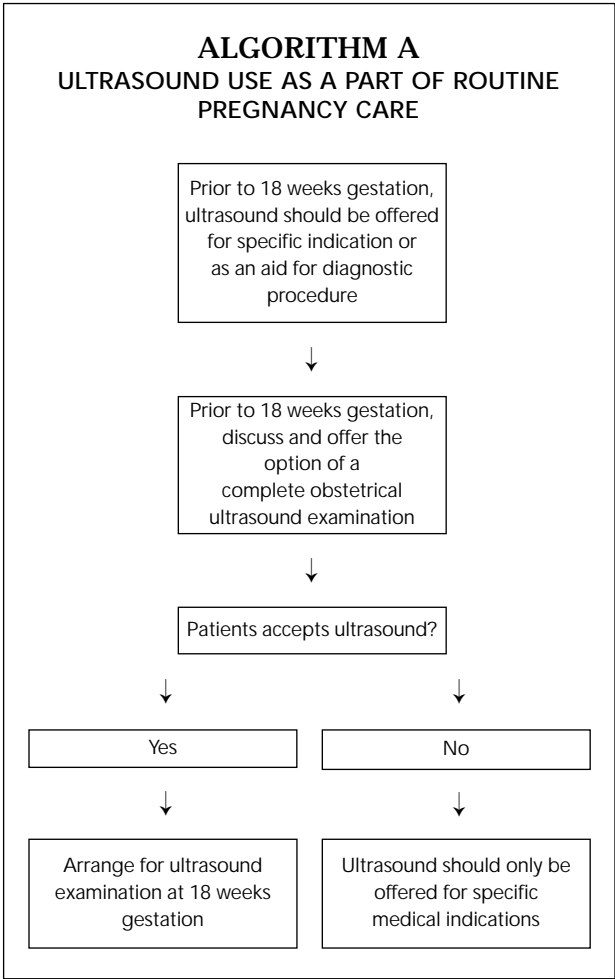
Sonographic measurement at 18 to 19 weeks gestation can establish gestational age to +/- seven days. Some randomized controlled trials suggest that routine ultrasound for dating may reduce the number of labours induced for suspected post-date pregnancy.

Accurate knowledge of gestational age is a keystone in a health professional's ability to care successfully for the patient. Not only is this knowledge of critical importance in the interpretation of antenatal tests, but also in planning appropriate therapy or interventions, including the use of tocolytics, the timing of Caesarean section, induction of labour and subsequent identification of intra-uterine growth restriction.¹³ Routine second trimester ultrasound may lower the rate of induction for presumed post-term pregnancy.¹⁴ The estimated date of

confinement derived from the last menstrual period differs by more than two weeks from the actual date of birth in nearly 25 percent of pregnancies.^{15,16} Clinical estimation of gestational age does not improve accuracy. In contrast, 90 percent of patients deliver within two weeks of the due date determined by ultrasound.¹⁶

The Cochrane library reported that with the use of routine ultrasound, significantly fewer low birthweight singleton births occurred and there was reduced risk of admission to special care nurseries.¹⁷ None of the randomized controlled trials has shown that dating with routine ultrasound reduces perinatal morbidity or mortality, unless associated with early termination of pregnancy for detected anomalies.¹¹

The Genetic and Diagnostic Imaging Committees of the SOGC (1997) have issued a statement recommending





the time that ultrasound dating should be done in relation to other screening tests.¹⁸ An 18 to 19 week ultrasound may be sufficient to confirm the gestational age in patients having prenatal maternal serum screening. However, it may be desirable for an ultrasound to be done earlier if the screening test is abnormal.

Ultrasound at 18–19 weeks gestation is a poor screening test for detection of intra-uterine growth restriction.

Accurate information on gestational age is necessary to determine the appropriate size and growth rate of fetal structures in the third trimester. Second trimester ultrasound detects fewer than a third of fetuses with intra-uterine growth restriction.¹⁹

Second trimester ultrasound leads to earlier detection of multiple gestations. Large randomized controlled trials indicate that early knowledge of twins does not lead to a significant reduction in perinatal morbidity and mortality.

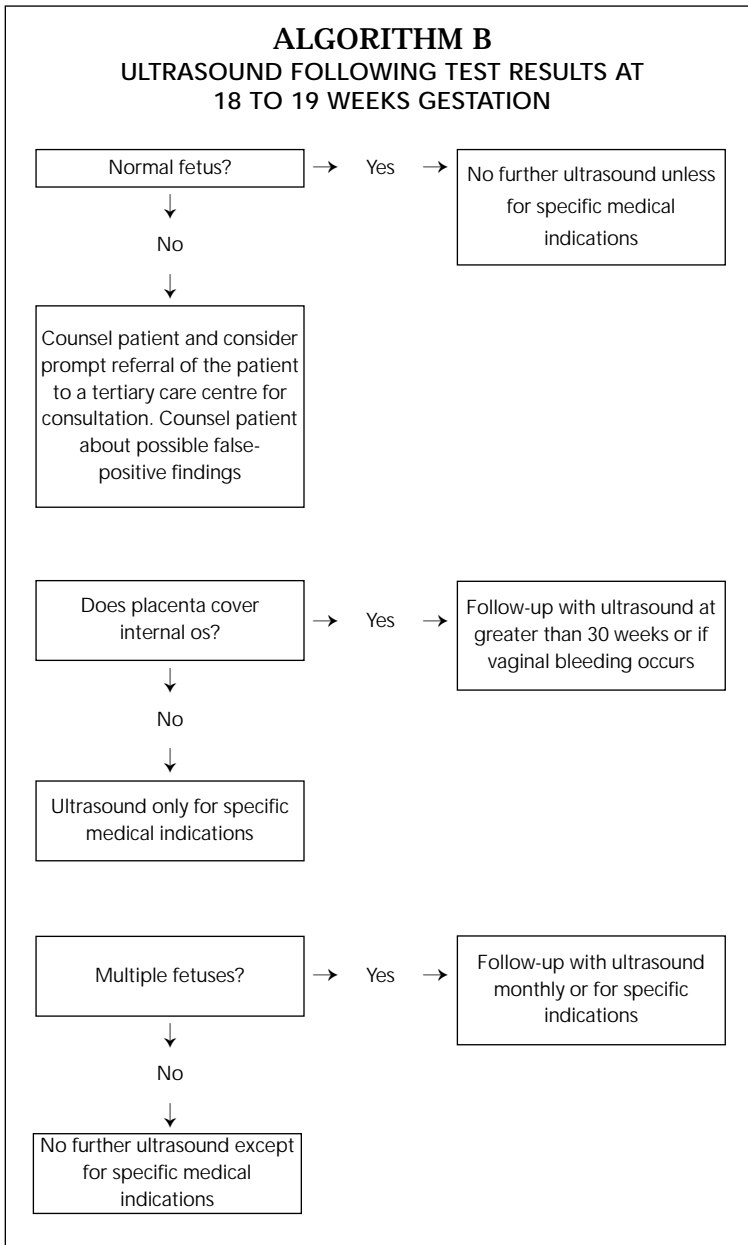
Six randomized controlled trials showed that twins were detected in 99 percent of women who had routine second trimester scans and in 64 percent of women who had not.¹¹ Data available from four of these trials, however, show a difference of less than one percent in mortality among twins for women with routine scans compared to those without routine scans.²⁰

Second trimester ultrasound is reliable in determining placental location. There is no evidence that routine ultrasound screening improves maternal or fetal outcomes in cases of placenta praevia.

The incidence of low-lying placenta is 13 percent at mid-trimester but only 0.4 percent at delivery.^{21,22} If the placenta covers the internal os at the time of the 18 to 19 week ultrasound and subsequent ultrasound at greater than 30 weeks (Algorithm B), this will usually provide reassurance that the condition no longer persists and, if it does, facilitate further management, including additional evaluation and potential discussion of the preferred location for and type of delivery.

SAFETY

There is no scientific evidence of a deleterious effect from diagnostic ultrasound on the developing human fetus.²³ Low birthweight, dyslexia, increased incidence of such cancers as leukaemia and





solid tumours, and delayed speech and delayed reading and writing skills have all been suggested. However, these studies have small sample sizes and all have significant design flaws. Larger, better designed studies refute the suggestion of any immediate or delayed deleterious effect of ultrasound on the fetus, as confirmed in a recent review.²⁴⁻²⁶

The biggest risk of ultrasound is over-interpretation or missed diagnosis.

PATIENT AUTONOMY

Mothers are strongly affected by watching their fetuses during an ultrasound examination. Ultrasound examinations have the potential to be happy experiences, but a real or mistaken diagnosis of fetal abnormality can lead to psychological devastation. Women attach value to the usefulness of the information. They also value ultrasonography for its own sake, and not as an aid for decision making.²⁷

Recently, failure to offer ultrasound has surfaced as a valid reason for litigation.²⁸ To respect their autonomy, every patient should be informed about the availability of ultrasound examination and should be given information about the potential benefits and risks of the procedure.

Respect for autonomy obligates the health care provider to consider the patient's values, and determine her preferences for care. Routinely offering diagnostic prenatal ultrasound respects the autonomy of the patient.^{29,30}

The patient should be informed that not all anomalies can be detected.

UTILIZATION

Two provincial studies in Canada would suggest that the overall rate of ultrasound examinations is 2.1 scans per delivery.³¹ Implementation of this guideline should reduce the number of prenatal ultrasounds but, more importantly, should ensure that they occur at the most appropriate time.

Offering ultrasound examination at 18 to 19 weeks gestation would improve the accuracy of diagnosis of

fetal anomalies, as the performance of a scan at this time is appropriate for such diagnoses. At the same time, the benefits of gestational age dating, diagnosis of twins, detection of intra-uterine growth restriction and placental localization are maintained.

CONCLUSIONS

Few diagnostic technologies have had a greater effect on the practice of obstetrical care than ultrasound. The greatest debate surrounding obstetrical ultrasound revolves around the advisability and appropriateness of offering pregnant women diagnostic prenatal ultrasound at 18 to 19 weeks gestation as a part of routine pregnancy care.^{19,31}

There is evidence (Level B*) to support offering routine ultrasound at 18 to 19 weeks gestation based on intermediate outcomes.¹ The evidence takes into consideration ethical, legal and psycho-social dimensions as well as utilization data. Physicians and other health professionals should routinely inform patients of the availability of second trimester (18 to 19 weeks gestation) ultrasound to enable the patient to make an informed choice about this screening.

*** Level B evidence: There is fair evidence to support the intervention being included in the periodic health examination.**

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