

Ministry of Health and Long-Term Care
In conjunction with the
Ontario Medical Association

Name
Address
Date of birth (yyyy/mm/dd) Age Marital status Education level
Occupation Language Home phone Work phone Name of partner Age Occupation
Birth attendants Family physician Newborn care Ethnic background of mother/father
Allergies (list) Medications (list)

Pregnancy Summary

Menstrual history (LMP): Cycle Regular EDB
Contraception: IUD Hormonal (type) Other Last used

Final EDB

Gravida Term Prem No. of pregnancy loss(es) Living Multipregnancy
Ectopic Termination Spontaneous Stillborn No.

Obstetrical History

Table with 8 columns: No., Year, Sex M/F, Gest. age (weeks), Birth weight, Length of labour, Place of birth, Type of birth SVB CS Ass'd, Comments regarding pregnancy and birth

Medical History and Physical Examination

Current Pregnancy Medical Genetic/Family Infection discussion topics Physical examination
Nutrition Assessment Psychosocial discussion topics Risk factors identified

Comments re Medical History and Physical Examination

Large text area for comments regarding medical history and physical examination.

Signature of attendant Date (yyyy/mm/dd)

A Guide to Pregnancy Assessment

In the event of maternal transfer, please photocopy the front sheet and send to referral hospital

This assessment system is intended as a basis for planning the on-going management of the pregnancy. The risk factors or problems listed below are intended as examples only. Additional space is provided for other risk producing problems which you have identified.

Healthy Pregnancy, no predictable risk:

- No prior perinatal mortality or low birthweight infant
- No significant medical disease
- No pregnancy complications now or in the past (bleeding, hypertension, premature labour)
- Fetal growth seems adequate

Pregnancy at risk:

The fetus/mother may be at risk and consultation should be considered with a specialist obstetrician in your area. In addition, consultation with an appropriate internist may also be necessary. These patients may be managed by continuing collaborative care and birth in an obstetrical unit with intermediate level nursing facilities OR they may be returned to the care of the referring physician with a suggested plan of management for the remainder of the pregnancy.

- | | |
|--|---|
| <input type="checkbox"/> Diabetes, Class A (gestational) or Class B | <input type="checkbox"/> Renal disease without hypertension |
| <input type="checkbox"/> Hypertension without toxemia | <input type="checkbox"/> Mild toxemia |
| <input type="checkbox"/> APH, ceased and in hospital | <input type="checkbox"/> Controlled premature labour |
| <input type="checkbox"/> Cervical incompetence | <input type="checkbox"/> Twin pregnancy |
| <input type="checkbox"/> Hydramnios | <input type="checkbox"/> Breech: beyond 36 weeks |
| <input type="checkbox"/> Post-date pregnancy (42 weeks +) | <input type="checkbox"/> Primigravida (age 35 yr. +) |
| <input type="checkbox"/> History of prior stillbirth or neonatal death or premature delivery | <input type="checkbox"/> History of genetic disease in family (Genetic amniocentesis or counselling required) |
| <input type="checkbox"/> Maternal obesity (20% > ideal b.wt.) | <input type="checkbox"/> Anemic not responding to iron (Hgb <10gm) |
| <input type="checkbox"/> Significant tobacco, alcohol, drug intake | <input type="checkbox"/> Weight gain <10lbs. by 30 weeks |
| <input type="checkbox"/> Rhesus immunization | <input type="checkbox"/> Grand multipara (>5) |
| <input type="checkbox"/> Premature rupture of membranes 33 wk. or more | <input type="checkbox"/> Large for dates |
| <input type="checkbox"/> Other significant medical illness | <input type="checkbox"/> Previous uterine surgery excluding lower segment cesarian section |
| | <input type="checkbox"/> Severe psychosocial problems |

Pregnancy at high risk:

Pregnancies which are so complicated that the fetus and/or mother are obviously in danger. If at all possible, these patients should be transferred to a regional perinatal centre (level III) for intensive care and birth. Clearly, there are patients who deserve to be placed in this risk category (with problems such as excessive antepartum bleeding, cord prolapse, or advanced uncontrolled premature labour) who cannot be transferred safely or in time to benefit the fetus or mother.

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| <input type="checkbox"/> Diabetes class C,D,F,R or significantly complicated | <input type="checkbox"/> Hypertension with superimposed toxemia |
| <input type="checkbox"/> Renal disease with hypertension \pm \downarrow function | <input type="checkbox"/> Early uncontrolled premature labour* |
| <input type="checkbox"/> Premature rupture of membranes (\pm sepsis)* | <input type="checkbox"/> Severe fetal growth arrest (<10th percentile) |
| <input type="checkbox"/> Antepartum bleeding, continuing or repeated* | <input type="checkbox"/> Heart disease, especially with failure |
| <input type="checkbox"/> Fetal anomaly | <input type="checkbox"/> Oligohydramnios |
| <input type="checkbox"/> Multi-fetal gestation, more than two | <input type="checkbox"/> ----- |
| <input type="checkbox"/> ----- | |
- * 24– 32 weeks gestational age

Two or more risk problems can combine to produce a high pregnancy risk. Such a patient may need to be placed in a higher risk category

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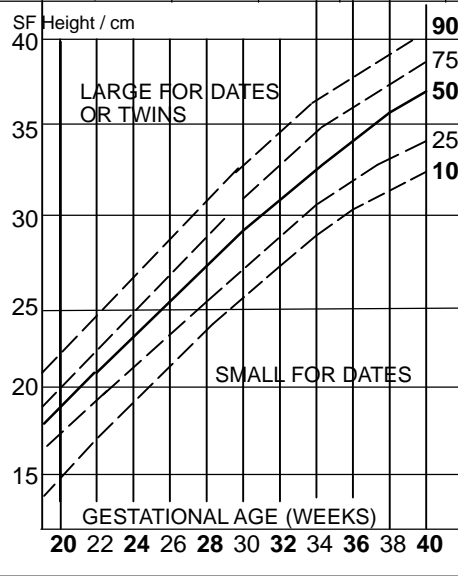
| | |
|------------------|--------------|
| Name | |
| Address | |
| Birth attendants | Newborn care |

Summary of Risk Factors, Allergies, and Medications

| Risk Factors | | Allergies | | Medications | | | | |
|-------------------------------|----------------|-----------|----------|-------------|----------|------------|-----|-------------|
| | | | | | | | | |
| Final EDB (yyyy/mm/dd) | G | T | P | A | L | Hb | MCV | MSS |
| Pre-preg. wt. | Rubella immune | HBs Ag | VDRL | Blood group | Rh type | Antibodies | | Rh IG Given |

Subsequent Visits

| Date | G-age wk. | S-F Ht. | Wt. (lb/K) | Presn Posn | FHR/FM | Urine Pr | Urine Gl | B.P. | Comments | Cig./day |
|------|-----------|---------|------------|------------|--------|----------|----------|------|----------|----------|
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|  | <table border="1"> <tr> <th colspan="3">Ultrasound</th> </tr> <tr> <th>Date</th> <th>GA</th> <th>Result</th> </tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </table> | Ultrasound | | | Date | GA | Result | | | | | | | | | | | | | <table border="1"> <tr> <th>Referral Plan</th> <th>Discussion Topics</th> </tr> <tr> <td> <input type="checkbox"/> Obstetrician <input type="checkbox"/> Pediatrician <input type="checkbox"/> Anesthesiologist <input type="checkbox"/> Social worker <input type="checkbox"/> Dietitian <input type="checkbox"/> Other </td> <td> <input type="checkbox"/> Drug use <input type="checkbox"/> Smoking <input type="checkbox"/> Alcohol <input type="checkbox"/> Exercise <input type="checkbox"/> Work plan <input type="checkbox"/> Intercourse <input type="checkbox"/> Dental care <input type="checkbox"/> Travel <input type="checkbox"/> Prenatal classes <input type="checkbox"/> Breast feeding <input type="checkbox"/> Birth plan <input type="checkbox"/> Preterm labour <input type="checkbox"/> PROM <input type="checkbox"/> Fetal movement <input type="checkbox"/> Admission timing <input type="checkbox"/> Labour support <input type="checkbox"/> Pain management <input type="checkbox"/> Depression <input type="checkbox"/> Circumcision <input type="checkbox"/> Car safety <input type="checkbox"/> Contraception <input type="checkbox"/> On call </td> </tr> </table> | Referral Plan | Discussion Topics | <input type="checkbox"/> Obstetrician <input type="checkbox"/> Pediatrician <input type="checkbox"/> Anesthesiologist <input type="checkbox"/> Social worker <input type="checkbox"/> Dietitian <input type="checkbox"/> Other | <input type="checkbox"/> Drug use <input type="checkbox"/> Smoking <input type="checkbox"/> Alcohol <input type="checkbox"/> Exercise <input type="checkbox"/> Work plan <input type="checkbox"/> Intercourse <input type="checkbox"/> Dental care <input type="checkbox"/> Travel <input type="checkbox"/> Prenatal classes <input type="checkbox"/> Breast feeding <input type="checkbox"/> Birth plan <input type="checkbox"/> Preterm labour <input type="checkbox"/> PROM <input type="checkbox"/> Fetal movement <input type="checkbox"/> Admission timing <input type="checkbox"/> Labour support <input type="checkbox"/> Pain management <input type="checkbox"/> Depression <input type="checkbox"/> Circumcision <input type="checkbox"/> Car safety <input type="checkbox"/> Contraception <input type="checkbox"/> On call | | | |
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| Selected Tests | Result | Comments | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 11. Other | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| | |
|------------------------|-------------------|
| Signature of attendant | Date (yyyy/mm/dd) |
|------------------------|-------------------|

Postnatal Visit

No of weeks postpartum

Date (yyyy/mm/dd)

History

Review of birth

Baby's health / concerns

Breastfeeding

Yes

No

Breastfeeding concerns

Bladder function

Lochia / Menses

Bowel function

Perineal discomfort

Contraception

Rubella immune

Yes

No

Vaccinated

Smoking history

Pap smear status

Physical Examination

Weight

lb / kg

B.P.

mm Hg

Affect

Thyroid

Breast exam

Abdomen

Perineum

Pelvic exam

Discussion Topics

Emotional problems / depression

Contraception

Sexual / relationship concerns

Social support

Family violence

Follow-up and advice re: future pregnancies (e.g. folic acid, and risk for future pregnancies)

Signature of physician or midwife



A Guide to the 2005 Revised Ontario Antenatal Record

Prepared by the *Ontario Medical Association* Antenatal Record Committee
(Dr. Laurence Colman, Chair, Dr. Crystal Cannon, Dr. Stan Lofsky, Dr.
Chuks Nwaesei, Dr. Kristy Prouse, Dr. Kathy Reducka, Ms. Kathi Wilson)

January 2006

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Introduction

The Ontario Antenatal Record is used to document the obstetrical care provided to almost all of the province's pregnant women. First and foremost, the Record is a communication tool. It documents the course of the pregnancy, and identifies risk factors and the plan of management in a standardized format. It is also a guide to what are considered the appropriate elements of obstetrical care.

The OMA has been responsible for the content and format of the Record, and the Ministry of Health and Long Term Care for its printing and distribution. The Record was first introduced in 1979 and underwent revisions in 1987 and 1993 under the auspices of the Reproductive Care Committee. In 2000 a subcommittee of the Women's Issues Committee revised and updated the Record. At that time the committee intended to pilot their revision prior to its general release. However the Ministry's inventory of the Record was nearly depleted, and printing a large stock of the 1993 version would have delayed the introduction of the post-pilot revision until that stock was used. The decision was therefore made to put the Record into general release and to rely on the feedback of the caregivers to evaluate it; in effect, to pilot it in general use.

In 2001 the Committee on Antenatal Record was reconvened as a separate entity reporting directly to the Board. Its primary terms of reference are to evaluate and to update the 2000 Record, and to reassess the Record on a continuous basis. The membership of the Committee differs from its immediate predecessor in that it is composed exclusively of end-users, that is, obstetricians, family practitioners, paediatricians, and midwives who provide care to pregnant women and their newborns.

The Committee began its work by soliciting feedback through the Sections on Obstetrics and Gynaecology, and Family and General Practice. It directly solicited the membership through advertisements in the Ontario Medical Review. Since 1994, midwives have also provided care and their feedback was obtained through a representative of the Association of Ontario Midwives.

The Committee's initial task was to evaluate the content of the Record. To this end, experts representing Perinatology, Genetics, Infectious Diseases, and the ALPHA Project concerning psychosocial issues were consulted. The initial intent was to include only those elements of care that had evidence-based validity. This was not always possible as the quality of evidence for many of the common practices is not as good as patients and practitioners might expect. This is not to say that the care is improper, but only that it has not been examined in a scientifically rigorous manner. Obstetrics is not unique in this regard as this is characteristic of many aspects of practice in all branches of medicine.

Recent Changes Made to the Ontario Antenatal Record

Items that did not meet a good evidence-based standard were selected for inclusion if they made reasonable sense to the end-users on the Committee, or because they had become so ingrained into what was considered a routine practice that their exclusion would be impractical. Many items of questionable validity were eliminated.

Having decided what was to be included in the Record, the Committee next addressed its format. There are two major changes to Page 1. First the method by which the pregnancy was dated is specified so the reliability of the Final EDB is readily apparent. Second the initial laboratory tests have been relocated from the second page.

There are two major changes to Page 2. First there is an expanded section for Identified Risk Factors and the Plan of Management. This is intended to funnel all pertinent information gathered throughout the Record (historical, physical, laboratory and radiological) to a single location where the risk and plan discussed with the patient can be easily located and reviewed. Previous versions included a number of places where risks could be noted and this tended to scatter the information. In addition for convenience, three common risk factors requiring immunoprophylaxis are listed, *viz.* Rh negative blood type, rubella susceptibility, and Hepatitis B exposure. The second major change is the Subsequent Visits section that contains reminders of the need for particular aspects of care in grayed text.

The changes reflect the manner in which the Record is to be circulated. Page 1 is to be forwarded to the Labour and Delivery suite of the hospital where the patient intends to deliver once the estimated date of birth is confirmed and the initial laboratory investigations are complete. It is expected that this will be done by twenty weeks gestation in most cases. Most patients who experience pregnancy-related complications and present to the hospital do so after twenty weeks. This ensures a record of their essential information is immediately available. Alternatively, a copy of the record can be given to the patient to bring to the Delivery Room with her.

Page 2 is to be forwarded to Labour and Delivery by thirty-six weeks when the bulk of the Subsequent Visits and Additional Laboratory Investigations are completed. However if a significant risk factor is identified, then the second page should be forwarded earlier.

Prior to finalizing the revised Record, a pilot study was undertaken. Members of the Committee sought participants for the study. A number of practitioners who were aware of the revision in progress contacted the OMA directly to volunteer for the pilot. A number of practices were involved to reflect the variety of settings where obstetrical care is delivered. These included teaching centers, community obstetrical and family practices in urban, small-town and rural settings, and midwifery practices that deliver patients both inside and outside of hospitals.

The Committee is satisfied that our final product is current, practical, and achieves its intended goal of documentation and communication.

Concurrent with the redesign of the paper Record, the Committee initiated the development of an electronic version in conjunction with OntarioMD. In its final form, the electronic Record will include pull-down menus to facilitate data entry. This will also facilitate the development of a common language especially for the recording of risk factors. Additional features that are only possible with an electronic format are currently being implemented.

The electronic version can be used as a stand-alone application on a single computer or networked to permit information to be entered by multiple providers. Extending this concept, there is the intention to develop a version that will store the data in a remote location that could be accessed by authorized providers at any time, and from any internet-accessible location. This will facilitate the exchange of information in a shared care setting, as well as providing current information to the hospital.

The Committee will continue to work to ensure the currency of the Record in light of the anticipated changes in practice and technology. The Record is sufficiently flexible to incorporate many changes without necessitating a wholesale review.

The purpose of The Guide to the Ontario Antenatal Record 2005 is to explain why its various elements were included in the Record, and the manner in which the Record is intended to be used. It can also be used as a reference to what is considered appropriate and necessary prenatal care.

The members of the Committee were hard-working and dedicated and I would like to commend them for their contributions. Much of the work was done outside of meeting time. Dr. Kathy Reducka a family practitioner from Pembroke, researched the literature extensively, and provided a practical viewpoint to the forms completion process. Dr. Crystal Cannon, a family practitioner from Thunder Bay, likewise brought her practical approach to the discussions. Ms. Kathi Wilson, a midwife from London representing the Ontario Association of Midwives, contributed her perspective and ensured that the Record will be usable in all settings where women deliver. Dr. Kristy Prouse, an obstetrician from Mississauga, helped to ensure the veracity of the Record's content. Dr. Chucks Nwaesei, a neonatologist from Windsor, provided helpful advice from the paediatric perspective, as well as the view of a practical user.

Dr. Stephan Bates, an obstetrician from Brantford, and Dr. Daniela Chacon, a paediatrician and neonatologist from London, and Ms. Freda Seddon, a midwife, were members of the Committee at its earlier stages and contributed to the assessment of the prior version and determining the appropriateness of the current form's content.

The Staff at the Ontario Medical Association, headed by Ms. Flora Aronshtam provided excellent technical support, and helped the Committee realize its vision.

Lastly I would like to echo my predecessor's recognition of the efforts of Dr. Stan Lofsky, a family practitioner from Toronto. Stan represented the Section on Family Practice. His formal involvement with the Record dates back to the 1992 revision. He brought a sense of history of the Record's development, as well as the perspective of an end-user. In addition, his efforts as a member of the OMA Board ensured the continued prominence of the Antenatal Record.

Revised Antenatal Record 1

Much of the-demographic information on Antenatal Record 1 is self explanatory, *viz.* the patient's name and address, telephone contact numbers, date of birth, Ontario Health Insurance Plan-number, office file number, and marital status. Her partner's name, age, occupation and educational level are also entered in a boxed area to clearly differentiate this data from the mother's. In addition the practitioners who are responsible for the care of the mother and/or the infant are noted for the ease of identification in the Labour and Delivery Suite, and this information is also recorded on the Antenatal 2.

Some of the information requested is of a personal nature. It is not mandatory to collect all of the information. It is included because in many cases, it is relevant to care for the patient appropriately. The following items warrant comment as noted below.

Language: Refers to the language most readily understood by the patient, especially if other than English, French, or another language commonly spoken in the pertinent community. This may indicate the need to obtain an interpreter if necessary either in the hospital or when communicating with the patient on the telephone. It also suggests the need to ensure that the patient and her partner comprehend fully the information provided to them.

Occupation and Educational Level: Refers to their occupation, including homemaker and the highest level of education completed. Occupational hazards may adversely impact on a pregnancy and alternative duties or work cessation may become necessary. The partner's occupation may also be relevant; for example when frequent out-of-town travel is required, or when her partner is in the military. Educational level is important in assessing their ability to comprehend oral and written information. One's occupation does not always correlate with the level of educational attainment, especially in cases of immigration.

Ethnic or Racial Backgrounds: Mother/Father: This is used to identify the patient and her partner as members of a specific racial or ethnic group in so far as their genetic risks are concerned. Conditions such as α - and β - thalassemsias, Sickle cell anaemia, cystic fibrosis, Tay Sachs, and Canavan disease are more common in parents of particular ethnic and racial groups and suggest the need for specific testing. Care should be taken to inquire specifically as to the father's background, as it may not be the same as the mother's.

Allergies or Sensitivities (describe reaction details): Refers to a true drug allergy as well as intolerance to a drug. The reaction should be described to determine both the likelihood of it being a true allergy, and the therapeutic safety of using an alternative medication that potentially could cross react. Allergies and sensitivities are also noted on Antenatal 2.

Medications/Herbals: Refers to any and all medications, prescription and otherwise, as well as complementary medicines and herbals the patient is taking. Any of these can potentially have deleterious effects on the mother and fetus. They may also interact with other recommended medications.

Pregnancy Summary

The majority of this area pertains to determination of the Final Estimated Date of Birth (EDB). Accurate dating is crucial to a properly managed pregnancy as many decisions will depend on correct dating, such as:

- whether labour is occurring at an appropriate time;
- whether the pregnancy is proceeding significantly beyond term;
- when to order time-sensitive tests, such as Prenatal Genetic Investigations, ultrasound surveillance of the fetus, and GBS screening;

The Final EDB is determined based on the most accurate of three criteria:

- the date of fertilization or ovulation;
- the menstrual history, or;
- the ultrasound measurement of fetal size.

Pregnancy achieved through Assisted Reproductive Techniques (ART) where the precise date of fertilization is usually known and is accurate to the day. The most common method used is IVF-ET (*in vitro* fertilization and embryo transfer which is usually referred to as simply IVF. There are a number of less used variants ¹. One interesting

¹ The common element to ART is the controlled stimulation of ovulation, the surgical aspiration of the unfertilized oocyte(s), and their combination with sperm in a controlled fashion. IVF is by far the most commonly utilized method where unfertilized oocytes obtained by ultrasound-guided or laparoscopic aspiration are combined with sperm in the laboratory and the resultant embryo is subsequently implanted in the uterus. Its variants include GIFT (Gamete Intra Fallopian Transfer) where unfertilized oocytes and sperm are injected into the fallopian tube at laparoscopy, and ZIFT (Zygote Intra Fallopian Transfer) where fertilization occurs in the laboratory and the embryo is inserted in to the tube at laparoscopy.

Another technique is ICSI (Intra-Cytoplasmic Sperm Injection) where an individual sperm nucleus is injected directly into the oocyte by manipulating the gametes under microscopic control. Assisted hatching techniques entail the disruption of the *zona pellucida* surrounding the oocyte either by laser or chemically in order to facilitate fertilization. Another technique involves the direct implantation of the embryo into the endometrium under hysteroscopic control. All of these techniques utilize IVF to acquire the gametes and are properly considered a subset of that method.

and confounding variant is frozen embryo transfer (FET) where an embryo obtained during one cycle is frozen and subsequently thawed in order to be implanted in another cycle. The embryo could also be donated to another woman. In these cases the age of the embryo at the time it was frozen needs to be ascertained (usually 16-19 days).

Other methods that entail close cycle monitoring where the date of ovulation is known, or when ovulation is induced are also highly accurate to within one or two days. This includes the use of ovulation predictor kits, ultrasound monitoring, and ovulation inducing drug regimens with or without hCG administration.

If the menstrual history is known, the EDB is calculated based on the first day of the last menstrual period using Naegele's rule (subtract three months and add seven days). Alternatively many electronic calculators count forward 280 days. Prospectively recorded dates are inherently more accurate than those obtained retrospectively. To utilize these rules a number of conditions have to be satisfied:

- The first day of the last menstrual period must be known. The practitioner should be certain that it is the first day that is recorded and not the last day of bleeding, and that the flow came when expected and was normal in amount and duration.
- The normal cycle length must be known. Naegele's rule is based on a 28-day cycle, and any regular variation from this requires an appropriate adjustment to the date.
- Other factors that may affect cyclical ovulation must be excluded. The recent use of hormonal contraceptive methods (less than three months prior to conception) and recent breast feeding may be a confounding factor in the resumption of regular ovulatory cycles.

Ultrasound determination of dating relies on the fact that there is a minimal variation in the size of the fetus through the first 24 weeks of gestation. The accuracy of fetal ultrasound biometry has been validated by studies of infants conceived by IVF-ET where the date of conception is known. In the first trimester, measurement of the crown rump length (CRL) by transvaginal ultrasound is accurate to within 3-5 days. Other early structures such as the diameter of the gestational sac are subject to greater user variability and are less accurate.

Second trimester ultrasound prior to twenty weeks utilizing a combination of measurements (biparietal diameter, head circumference, and femur length) are accurate to within seven days. Although the abdominal circumference measurement is often reported and is of use in estimating fetal weight, it may not be as useful in determining the gestational age.

Late second trimester ultrasound between 20 and 24 weeks using the same combination of measurements is accurate to within twelve days. Ultrasound measurements performed beyond 24 weeks are highly inaccurate with regard to estimating the gestational age as the range of error is three to four weeks. Although third trimester ultrasound reports specify an estimated gestational age, this is simply a convenient and clinically useful way

to express fetal size to facilitate comparison on serial ultrasounds. It does not reflect the true age and the Final EDB should not be altered on this basis.

Other clinical parameters have been used (such as uterine size and in particular the palpation of the uterus at the umbilicus by twenty weeks) but they are far less accurate. A single act of intercourse is also reliable to within two days in the vast majority of cases, but may extend up to five days.

In general the only information available when prenatal care is initiated is the menstrual history. This is used to establish a preliminary EDB and is recorded under EDB (by dates). It is subject to confirmation by other methods of dating. The Final EDB is determined by the most accurate dating method available and this is noted by checking the appropriate box. The hierarchy of dating criteria from the most accurate to the least is as follows:

1. Assisted Reproductive Technologies;
2. First Trimester Ultrasound Between Five and Twelve Weeks using CRL;
3. Second Trimester Ultrasound (prior to twenty weeks) and Prospectively Recorded Menstrual Dates;
4. Late Second Trimester Ultrasound (between twenty and twenty-four weeks) and Retrospectively Recorded Menstrual Dates.

If the Final EDB cannot be determined by one of the first three methods listed above (for example, due to a late presentation beyond twenty weeks) this fact should be noted in the Identified Risk Factors. Time-sensitive decisions should be made with extreme caution.

The Final EDB should be re-entered on the Antenatal 2. With few exceptions the EDB should be finalized by twenty weeks and once determined, it should not be altered. The only exceptions should be when a review of the dating criteria reveals a miscalculation, or when it becomes known that there is a fetal anomaly or other problem resulting in early growth retardation

A discrepancy often arises between dating by menstrual history and the second trimester ultrasound. If the difference is greater than seven days, then most practitioners give precedence to the ultrasound date, particularly if the gestational age is less than that suggested by the menstrual dates as ovulation may have occurred later in the conception cycle. This practice is supported by the ultrasound data from IVF-ET pregnancies. If the difference is less than seven days, some practitioners still give precedence to the second trimester ultrasound date, but this is not necessarily more accurate and may confuse the patient if she had earlier been given a date in accordance with her menstrual history. The specialty organizations are silent as to which should be given precedence in this instance. Each practitioner should establish a consistent manner with which these minor discrepancies are dealt.

This section also records the GTPAL which refers to:

- Gravidity;
- Term deliveries;
- Preterm deliveries, *viz.* after 20 weeks and prior to 37 weeks gestation, or weighing more than 500 grams;
- Abortuses including first trimester abortions (complete, incomplete and therapeutic), early second trimester abortions prior to 20 weeks, ectopic pregnancies, and molar pregnancies;
- Living children

The details pertaining to these pregnancies are recorded in the section below, and the GTPAL is also re-entered on the Antenatal 2.

Obstetrical History

For each pregnancy, the practitioner should record the sequence and year of birth, sex, gestational age, birth weight, length of labour, place of birth and the type of delivery. Space is provided for comments regarding antepartum or labour complications, as well as any interventions employed. This includes cervical ripening, induction or augmentation of labour, indications for operative deliveries or Cesarean sections, *etc.* Factors that might impact on the present pregnancy should be listed in Identified Risk Factors on the Antenatal 2.

If additional space is required to record all the pregnancies and comments, then a second Antenatal 1 should be used.

Medical History and Physical Exam

The mother's history and physical examination is outlined and divided into seven sections:

- Current Pregnancy;
- Medical History;
- Genetic History;
- Infectious Disease;
- Psychosocial;
- Family History;
- Physical Examination.

To facilitate data collection, a "Yes or No" choice is provided for each element of the history, and a "Normal or Abnormal" choice for each element of the physical examination. Each item is expressed in a manner that can be answered in a positive or negative fashion. Consideration was given to using a check box format where only the significant negatives would be marked and detailed. However this creates uncertainty as

to whether an item not marked was actually reviewed. There are also medicolegal considerations as an item not marked specifically is often construed not to have been reviewed.

In the interest of quickly completing the record, many practitioners may prefer to mark a null sign in the column, or otherwise indicate that all items are answerable in the negative. However the preferred method would be simply to draw a line through the appropriate choice, indicating a full completion of the record. It should be noted that two items, *viz.* “Calcium adequate” and “Preconceptual folate” are often answered in the affirmative.

Each item is numbered. A comments box is provided at the bottom of the page. Significant aspects of the history and physical findings should be described in detail therein, preceded by the number of the specific item. If any positive element or abnormal finding will impact the pregnancy plan of care, then it should be listed on the second page as an identified risk factor along with the plan of management.

Many additional items could have been listed in the History and Examination section. The ones listed were chosen because they are relatively common in a pregnant population and because they can significantly impact on the pregnancy.

Current Pregnancy

Bleeding: Refers to any vaginal bleeding that has occurred during the pregnancy. The accuracy of dating may be affected if the last menstrual period recalled is due instead to early pregnancy or peri-ovulatory bleeding. Immunoprophylaxis is indicated in Rh-negative women with first trimester bleeding if it can be administered in a sufficiently timely fashion. Many patients experience bleeding with a normal pregnancy, but abnormalities of gestation should also be considered such as a missed or incomplete abortion, an ectopic pregnancy, or a molar pregnancy.

Nausea/vomiting: Refers to significant symptoms. Although this is generally a self-limiting condition that resolves in the first trimester, anti-emetics are commonly prescribed and hospitalization or home intravenous therapy are sometimes required. A mother’s adaptation and outlook towards her pregnancy can be adversely affected.

Smoking # cig/day: Refers to ongoing smoking during pregnancy. The estimated number of cigarettes smoked daily is entered. Smoking is associated with low birthweight and intrauterine growth retardation, preterm labour, and perinatal death. It may also be associated with pregnancy induced hypertension and other negative perinatal outcomes, and impair infant and early childhood lung development through second-hand exposure. These are potentially preventable. There is a significant social stigma to smoking and many patients may be reluctant to disclose the fact that they continue to smoke while pregnant. Smoking may be an indicator of stress and anxiety surrounding the pregnancy and other lifestyle factors. Smoking cessation programmes are successful in helping women stop. The OMA has prepared an excellent article describing the

scientific and clinical experience with tobacco dependence (www.oma.org/phealth/stopsmoke.htm) that dispels many of the myths associated with cessation. A good resource to help clinicians enhance their skills in dealing with this health issue is available through the OMA-sponsored Clinical Tobacco Intervention website (www.ctica.org). It provides tools to help identify tobacco users and to assist them in their attempts to quit. Health Canada publishes general information, as well as a helpful guide entitled *Quit Smoking Telephone Counselling Protocol for Pregnant and Postpartum Women* (http://www.hc-sc.gc.ca/hl-vs/pubs/tobac-tabac/protocol/index_e.html). Physicians for a Smoke-Free Canada provide another excellent source of information and tools (www.smoke-free.ca). There are also self-help sites such as Pregnets (www.Pregnets.org).

Alcohol, street drugs: Refers to alcohol consumption and recreational drugs. The safe level of alcohol consumption during pregnancy has not been established. The consumption of alcohol has been associated with deleterious effects such as growth restriction, mental retardation, a dysmorphic syndrome (Fetal Alcohol Syndrome) and neonatal behavioural abnormalities. It also may be an indicator of a nutritionally inadequate diet and other psychosocial factors. The occasional use of marijuana is not clearly associated with adverse outcomes and the effects of other drugs are not well studied with two exceptions. Cocaine is associated with congenital anomalies, growth restriction, stillbirths, preterm labour, and placental abruption. Narcotics are associated with growth restriction, preterm labour, and withdrawal complications in the newborn. Methadone maintenance programmes require expert care to avoid the use of supplemental narcotics and to prevent fetal complications such as stillbirth due to *in utero* withdrawal. Street drug use is also an indicator of other psychosocial and socioeconomic factors.

Occup./environ. Risks: Refers to work-related or other environmental situations. Hazardous substances in the workplace include ionizing radiation, toxic chemicals (solvents, pesticides, *etc.*), heavy metals, smog, infectious organisms, pharmaceuticals, and many others. While research may not have proven a deleterious effect on pregnancy, unnecessary exposures should be avoided. Second-hand smoke both in the workplace and at home is also an avoidable factor. Jobs involving heavy lifting, climbing, carrying or standing may increase the chance of injury due to the effect on balance and energy that accompanies normal pregnancy weight gain. Work modification may be recommended. Specific information regarding these risks is available from both Health Canada (www.hc-sc.gc.ca/ewh-semt/index_e.html) and the United States Department of Labor Occupational Safety and Health Administration (<http://www.osha.gov/>).

Dietary restrictions: Refers to the adequacy of nutrition. Vegetarian diets and in particular a vegan diet (no animal products of any type) require adjustment to ensure adequate protein, vitamins, and minerals. Eating disorders such as anorexia and bulimia may be present or may resurface during pregnancy. Maternal obesity may suggest an inappropriate diet. Nutritional and/or psychological counseling may be of benefit in achieving an appropriately balanced energy and protein diet. Dietary misconceptions such as the amount of increased intake and the need for protein can be explored. Inborn

errors of metabolism such as phenylketonuria may be recalled. While an adult may consume a normal diet, it would be deleterious to the developing fetus.

Calcium adequate: Refers to the lack of dairy products in the normal diet. Dairy products are the most common source of calcium in adequate quantity, but dietary choices or intolerances may be a limiting factor. Other sources of calcium including supplements may be necessary.

Preconceptual folate: Refers to folic acid supplementation initiated prior to conception. Folic acid supplementation reduces the incidence of open neural tube defects (ONTD), *viz. spina bifida* and anencephaly. It also reduces the incidence of congenital heart defects, urinary tract anomalies, oral facial defects (cleft lip and palate), limb defects, and pyloric stenosis. In order for it to be effective, supplementation should be initiated at least one month prior to conception and continued throughout the first trimester.

For primary prevention in women who are not considered to be at risk, the appropriate dose is currently being investigated. The required dose may vary with basal folate levels which in turn may reflect dietary preferences (cultural and otherwise) and genetics. A diet rich in natural sources of folate should be consumed, *viz.* broccoli, spinach, peas, brussell sprouts, corn, beans, lentils and oranges). A daily multivitamin supplement containing 0.4 to 1.0 mg should be added. Most prenatal vitamins contain 1.0 mg of folate. If a multivitamin is not tolerated, for example because of the gastric side effects of iron, then folate alone can be taken.

For secondary prevention or women who are at increased risk, a dose of 4.0 to 5.0 mg daily is recommended. Apart from a prior affected child, risk factors include a family history (first, second, or third degree relative of either the mother or father), insulin-dependent diabetes mellitus, and epilepsy treated with carbamazepine or valproic acid. Folic acid antagonists (such as methotrexate and amnioplerin) also increase the risk, but few pregnant women are prescribed these knowingly.

The additional folate should be taken as the vitamin alone, and not as additional multivitamins due to the potential deleterious effects of the excessive ingestion of other vitamins, particularly Vitamin A. Lastly, Vitamin B₁₂ deficiency should be excluded prior to prescribing a dose greater than 1.0 mg

While this question documents the use of supplementation in the current pregnancy, it also affords an educational opportunity for future pregnancies since prevention is only possible if supplementation is initiated prior to conception.

Medical History

Hypertension: Refers to chronic hypertension and previous pregnancies complicated by Gestational Hypertension. Such pregnancies are at increased risk if hypertension progresses beyond a mild to moderate degree. Current anti-hypertensive treatment may need to be modified, and baseline studies of organ function obtained. More frequent

antenatal visits may be needed and referral to a specialist or tertiary care center may become necessary.

Endocrine: Refers to all endocrine disorders, of which diabetes and thyroid are most commonly encountered. Types 1 and 2 diabetes require more intensive monitoring and in some cases referral to or co-management with an appropriate specialist. This is particularly true if there is end-organ involvement (renal, cardiac, vascular, ophthalmologic, or neurologic). There is a risk of recurrence if a prior pregnancy was complicated by gestational diabetes. Thyroid disorders are common and require increased monitoring and adjustment of medication.

Urinary tract: Refers to pre-existing disorders and those complicating a prior pregnancy. A history of recurrent urinary tract infections, especially pyelonephritis, as well as urolithiasis predisposes the current pregnancy to the same complication. Congenital anomalies are relatively common, and a family history places the fetus at increased risk for anomalies. The fetus should be surveyed with ultrasound and special attention paid to the urinary tract. Knowledge of the maternal anatomy may become relevant in the case of surgical intervention.

Cardiac/pulmonary: Refers to significant cardiac disease, including congenital heart disease, and chronic respiratory disease, including asthma. Many types of congenital heart disease are being successfully treated and women are living to childbearing age. The management of each type of defect (corrected and uncorrected) to the exertional hemodynamic stresses of pregnancy may require specialist care or co-management, and possibly delivery in an appropriate tertiary care center. Acquired cardiac disease, such as the sequelae of rheumatic fever including the insertion of prosthetic heart valves, presents a maternal risk of cardiac insufficiency and death and likewise mandates appropriate specialist care. Asthma is very common and inadequate control is a risk for preterm labour and intrauterine growth retardation in addition to the maternal complications. Commonly used asthma medications such as bronchodilators and inhaled steroids are safe to use in pregnancy.

Liver,hepatitis,GI: Refers to significant pre-existing liver and gastrointestinal disease. Some liver diseases such as acute fatty liver and HELLP syndrome are unique to pregnancy. While there is no clear evidence that mothers are at increased risk for a recurrence, close observation is warranted. Chronic liver disease is usually associated with infertility, but some women will conceive and bear monitoring for complications of portal hypertension and worsening liver function. Hepatitis B is relatively common especially given the increased immigration from countries where it is endemic. Universal screening for HBsAg is recommended. The pregnancy is not usually affected adversely in the case of chronic infections. Partners and other household contacts should be tested to determine their susceptibility so that immunization can be offered if appropriate. Hepatitis C is being encountered to an increasing extent. Targeted screening should be offered to all women at risk, *viz.* present or past injection drug users, haemodialysis

patients, blood recipients, people who practise unsafe sex and have multiple sex partners, children of HCV infected individuals, and those with tattoos done in establishments that do not respect national safety recommendations. A vaccine is currently being developed. As in the case of Hepatitis B, the pregnancy is not usually affected adversely with a chronic infection.

For both Hepatitis B and C, health care workers should take steps to minimize their exposure, even where universal precautions are in effect.

Gynaecology, breast: Refers to significant gynecological or breast problems. Fibroids by virtue of their size or location may present a risk for pregnancy loss, preterm labour and Cesarean section, and may grow during the pregnancy. Previous cervical dysplasia whether or not it was treated may require close monitoring, including colposcopy. Breast problems in a prior pregnancy indicate the need for close attention especially in the postpartum period when the ability to breastfeed may become an issue. Some breast surgeries may impair the ability to breastfeed. Lastly, breast cancer can occur especially in an older mother, and breast masses warrant appropriate attention.

Hem./immunology: Refers to significant hematological or immunological disorders. Pregnancy is a risk factor for thromboembolic disease and a prior history further increases the risk especially if it is associated with a hypercoagulable state such as Factor V Leiden. Prophylactic anticoagulation may be indicated. Systemic lupus erythematosus, *myasthenia gravis*, and rheumatoid arthritis can also impact upon pregnancy.

Surgery: Refers to all previous surgeries. These may or may not affect the current pregnancy, but it may be indicative of an underlying disease or an altered surgical anatomy.

Blood transfusions: Refers to any prior transfusions. Blood transfusions are administered for significant events including maternal disease, surgery, trauma, or a prior pregnancy with bleeding. This can aid in the recall of such events. Some of the sequelae of adverse transfusion events will be detected through routine testing, such as atypical alloimmunization (in particular the development of Kell and other antibodies that predispose to hemolytic disease of the newborn) and infectious diseases. As well it indicates a need for testing for other infectious diseases, such as Hepatitis C and HIV.

Anaesthetic complications: Refers to significant complications from prior anaesthetics. This includes metabolic disorders such as malignant hyperthermia and pseudocholinesterase deficiency, difficult intubations, as well as severe postoperative vomiting. Appropriate precautions can be taken if a repeat anaesthetic is required, especially general anaesthesia.

Psychiatric: Refers to a significant past or current psychiatric disorder. This includes mood, eating, anxiety, and substance abuse disorders, as well as psychotic illnesses. These may be exacerbated in pregnancy and medication dosages(s) may need to be altered. Particular attention should be paid to the postpartum period, particularly when

there is a history of postpartum depression, and an early follow-up visit should be planned.

Epilepsy, Neurological: Refers to any significant neurological disorder or epilepsy. For women with a seizure disorder a change of antiepileptic medication may be necessary to minimize potential congenital anomalies such as congenital phenytoin syndrome. Supplemental folic acid may also be required.

Other: Refers to any other medical condition of note.

Genetic History

The section is divided into two parts. The first part describes an ethnic or racial background that may signal a risk for a specific disorder. This is linked to the demographic data describing the ethnic and racial backgrounds of the mother and father. The second part describes a family history of a specific disorder that may be inheritable. Both the maternal and paternal histories are relevant and are to be included.

Ideally carrier testing will be done prior to pregnancy so that genetic counseling of the affected couple can be undertaken, and if possible, prenatal diagnosis can be arranged.

At risk population: Refers to significant inheritable diseases. In some cases testing is available to exclude a carrier state. Referral to a genetic center may be indicated for counseling and fetal surveillance. Examples of common disorders for which testing is available are listed. This is not intended to be complete list, but rather reflects conditions that are more commonly encountered in a typical patient population. Advanced maternal age is not listed here as information regarding this risk factor is captured in the Initial Laboratory Investigations. To facilitate data capture, the specific risk factor can be underlined and the specific details entered in the Comments box.

Family history of:

Developmental delay: Refers to any significant mental or physical delay. This may suggest an underlying disorder and indicate the need to obtain additional information from the affected family member, and the need for early neonatal assessment.

Congenital anomalies: Refers to any significant anomaly. Many anomalies are part of a syndrome that may be inheritable. A mid-second trimester ultrasound at a center skilled at resolving the fetal anatomy would be helpful. Some anomalies may require intervention at or shortly after birth, and referral to an appropriate paediatric surgeon or paediatrician prior to delivery may be indicated. A Cesarean section and/or delivery at a hospital capable of caring for the infant may be recommended.

Chromosomal disorders: Refers to any known autosomal or sex chromosomal disorder. Parental karyotyping may be needed to exclude genotypic abnormalities that have normal phenotypes, such as a balanced translocation, as fetal karyotyping may be needed.

Genetic disorders: Refers to any other inheritable genetic disorder. There is a multitude of single gene and polygenic disorders that are included in this group. As molecular genetics advances, more are discovered.

Infectious Diseases

Varicella susceptible: Refers to a prior history of varicella infection or immunization. Varicella poses risks for both the mother and fetus. More than 90 per cent of women who have had varicella will accurately recall this when questioned and serological testing is not required. Women who do not recall being infected should be tested to document their immune status. A mother who is truly susceptible should be counseled to avoid exposures while pregnant to both varicella and herpes zoster, and to consider active immunization following the pregnancy. Susceptible mothers who are exposed while pregnant may benefit from passive immunization administered in a timely fashion

STDs/HSV/BV: Refers to a past or present history of a sexually transmitted disease including herpes specifically, as well as current symptoms of bacterial vaginosis. Syphilis and Gonorrhea pose threats to both the mother and fetus, while Chlamydia in particular is a potential threat to the newborn. These also present public health issues. While universal screening should identify current infections, a prior history suggests a risk for reinfection requiring repeat testing, as well as necessitating the need to determine that the prior infection was adequately treated.

Active genital herpes infections in labour are potentially transmissible to the fetus, particularly if it is a primary infection. A prior infection should prompt inspection at the time of labour for asymptomatic lesions. Cesarean delivery may be warranted, especially if there is a primary outbreak. Recurrent herpes outbreaks remote from the genitals (*e.g.* thigh or buttock) should be covered with an occlusive dressing, but vaginal delivery is warranted as the risk of transmission is small. Symptomatic bacterial vaginosis may be treated during pregnancy.

Tuberculosis risk: Refers to a prior history of active disease, whether treated or not, as well as membership in a high-risk group. Some patients have not undergone a complete course of treatment for a TB infection and will need to complete it postpartum. High-risk groups include immigrants from endemic areas, immunosuppressed patients including those who are HIV positive, patients with significant substance abuse, and those of low socioeconomic status especially with malnourishment.

Other: Refers to other infectious diseases not noted above. This includes previous infections with, or potential exposures to other infectious agents, including toxoplasmosis, CMV, Parvovirus B-19, West Nile virus, malaria, and Lyme disease. If work or personal circumstances suggest a risk of exposure, it may be prudent to determine the patient's antibody status early in pregnancy. This will facilitate counseling regarding avoidance, and minimize the inherent anxiety when antibody levels need to be determined after exposure.

Psychosocial

Pregnancy is a period of psychosocial stress. In addition, pre-existing psychosocial problems can be exacerbated. A number of factors that can be identified in the antenatal period are associated with a poor postpartum psychosocial outcome, such as:

- child abuse;
- woman abuse;
- couple dysfunction;
- postpartum depression;
- increased infant physical illness.

The Antenatal Psychosocial Health Assessment (ALPHA) Form was developed and tested in Ontario as a tool for identifying families at risk. The early identification of risk factors will alert the caregiver to monitor the family more closely and to tailor a strategy of intervention that best suits an individual situation. *The ALPHA Form can be found on the OMA website at <https://www.oma.org//Forms/index.asp#maternity>.*

The ALPHA Form has two parts. The first section can be completed by the caregiver, or alternatively the patient may complete the second section, a self-reporting questionnaire. The items listed on the Antenatal Record roughly correlate with the sections on the form. Suggestions for how to ask the questions in an open-ended, individualized manner are described below. Suggestions of useful follow-up strategies are listed. Providers should be aware of the resources available in their community so that an appropriate referral can be made.

In addition to psychosocial factors, religious and cultural issues need to be assessed. These are not a component of the ALPHA Form, but might need to be factored into the care plan.

Social Support: Poor social support is an important risk factor in pregnancy associated with postpartum depression, later child abuse, and woman assault. Questions about how the patient's partner or family feel about the pregnancy, and who will be helping with the baby when she goes home, are useful ways to elicit this information.

Couple's Relationship: Problematic relationships have been found to be associated with increased dysfunction in the postpartum period, postpartum depression, woman abuse, and child abuse. For women who are in a relationship, useful questions are: "How would you describe your relationship with your partner?" and "What do you think the relationship will be like after the baby arrives?"

Emotional/Depression: Women should be advised that some women feel more emotional or sad during the pregnancy or postpartum period. While some degree of this is normal, severe depression, or depression lasting more than two weeks, requires evaluation for possible treatment. Women with a past history of depression are particularly vulnerable to difficulties at this time. Useful questions are: "Have you ever

had emotional problems?" or "Have you ever seen a psychiatrist or therapist?" A history of psychiatric or emotional problems has been found to be associated with child abuse, woman abuse, and postpartum depression. Depression during pregnancy is associated with postpartum depression. A useful question to elicit this is: "How has your mood been during this pregnancy?"

Substance Abuse: Alcohol and substance abuse present a problem to the pregnant woman and to her unborn baby, and have also been found to be strongly associated with woman abuse and child abuse. Useful questions to elicit this information are: "How many drinks of alcohol do you have per week?" "Are there times when you drink more than that?" "Do you and/or your partner use any drugs?" and "Do you and/or your partner have a problem with alcohol or drugs?"

Family Violence: Canadian statistics indicate that 20 per cent to 30 per cent of women experience violence at some time in their lives, and approximately 7 per cent will experience violence during a pregnancy. Abuse may be physical, emotional, or sexual, and may worsen during pregnancy and the postpartum period. Useful questions to elicit this are: "Do you ever feel frightened by what your partner says or does?" "Have you ever been hit, pushed, slapped, or emotionally abused by a partner?" "Have you ever been forced to have sex against your will?" Women may have also witnessed or experienced physical, emotional, or sexual abuse in the past, including childhood, which may be associated with difficulties in childbearing and birth. Previous child abuse by the woman or her partner is a warning sign for future child abuse.

Parenting Concerns: Parenting concerns may be related to the physical or emotional aspects of child care. Concerns around feeding, sleeping, health, and bathing are common. There may also be concerns about coping with crying and "discipline." Helpful questions are: "Do you expect any difficulties looking after the baby?" and "How do you deal with your children at home if they misbehave?" Parenting concerns are not only for the child to be born, but also for the children at home.

Relig./cultural issues: Refers to any religious or cultural issue that may impact on pregnancy care. This includes for example a Jehovah's Witness who would not accept a blood transfusion, or a woman who would not allow a male physician to care for her.

Family History

At risk population: Refers to a significant family history of a condition that may be inherited and would place the pregnancy at risk. Examples are given, *viz*, diabetes mellitus, deep vein thrombosis/pulmonary embolus, hypertension (PIH¹/HT), postpartum depression and thyroid abnormalities. Any other significant items can be described.

¹ The Canadian Hypertension Society Consensus Conference has redefined hypertensive disorders in pregnancy (http://epe.lac-bac.gc.ca/100/201/300/cdn_medical_association_cmaj/vol-157/issue-6/0715.htm). PIH (pregnancy induced hypertension) is no longer a part of the classification. The Antenatal Record will be revised in the future to reflect the revised terminology.

Physical Examination

The systems listed are general with a focus on the obstetrical exam.

The patient's vital signs pertain to those obtained at the first visit. The pre-pregnancy weight is not recorded, as it is often inaccurate because of a recall bias and because a different scale is used. The BMI (calculated as the weight in kilograms divided by the square of the height in meters¹) is a more valid reflection of the patient's status and should be calculated at the first visit. The BMI will obviously increase during pregnancy but not all the health risks associated with a high BMI are pertinent to pregnancy. However, patients with a high BMI are at increased risk for a number of pregnancy complications, including hypertension (gestational and chronic) diabetes, antepartum stillbirth, preterm labour, and large for gestation infants with its attendant labour and delivery risks (*viz.* Cesarean and operative deliveries, shoulder dystocia, Meconium aspiration, and nonreassuring fetal heart rate tracings).

Women with a low BMI are also at risk for low birth weight infants and preterm labour.

The BMI can be used to underscore dietary counseling, and to determine the appropriate range of weight gain in pregnancy.

Initial Laboratory Investigations

A number of laboratory investigations are done routinely in order to identify the need for intervention. There are also three blank rows for additional tests that may be indicated in an individual patient.

Hb (haemoglobin): Refers to any abnormality in the CBC. Although haemoglobin is the only test listed, laboratories provide a complete blood count that permits the identification of anaemia (frequently iron-deficient) as well as thrombocytopenia and leukocyte abnormalities.

MCV (mean corpuscular volume): Refers to any abnormality in cell volume. This is most useful in identifying a more severe degree of iron deficiency, as well as thalassemias where the MCV will be less than 80. Abnormalities should be investigated by haemoglobin electrophoresis. If the mother has thalassemia, the father should be tested to assess the probability that the child will have thalassemia major.

ABO and Rh: Refers to the major blood groups. The ABO grouping is less important clinically but it is determined along with the Rh group and patients have come to expect to know their ABO type. The Rh type is the most important for the fetus. Maternal

¹ Alternatively, the BMI may be calculated as the weight in pounds divided by the square of the height in inches, and the result multiplied by 703. In addition, there are a number of online calculators, as well as tables available (www.cdc.gov/nccdphp/dnpa/bmi/calc-bmi.htm).

sensitization to the Rh (D) antigen and the sequela of haemolytic disease of the newborn in a subsequent pregnancy has almost been eradicated by the timely administration of anti-D immunoglobulin (Rh-IG) whenever there is a risk of fetomaternal haemorrhage. This includes:

- birth of an Rh-positive child;
- all forms of abortuses (spontaneous, missed and induced abortions, ectopic and molar pregnancies);
- antepartum haemorrhage (first trimester bleeding, placental abruption and placenta praevia);
- invasive fetal procedures (amniocentesis, chorionic villous sampling, placental biopsy, and cordocentesis);
- abdominal trauma (significant blunt trauma especially from motor vehicle accidents, and external podalic version).

However significant fetomaternal haemorrhage can also occur without any of the risk factors noted. This is most common in the last trimester and therefore the prophylactic administration of Rh-IG at twenty-eight weeks is recommended.

Antibody Screen: Refers to any circulating antibody measured by indirect Coomb's. A positive screen warrants additional testing in order to identify the specific antibody. Sensitization to Rh has become rare because of the availability of Rh-immunoglobulin prophylaxis. There are a number of other red blood cell antigens that can result in maternal sensitization. In some cases the maternal response is to produce IgG which can cross the placenta due to its small molecular size and haemolytic disease of the newborn can result. If an atypical antibody capable of causing haemolytic disease of the newborn is identified, then serial titres need to be measured and referral to a tertiary centre or early delivery as appropriate should be undertaken. A positive antibody screen can also result from warm- or cold-reacting antibodies that are of no clinical significance.

Rubella immune: Refers to rubella immunity, whether natural or induced. A fetus is at risk for congenital rubella syndrome if the mother has clinical rubella in the first sixteen weeks. Rubella susceptible patients should be counselled to avoid exposures, and to be immunized against rubella prior to leaving the hospital after delivery.

HBsAg: Refers to a positive Hepatitis B surface antigen which is a marker for a prior Hepatitis B infection. A percentage of those patients become chronically infected and are at risk for perinatal transmission. The newborn should be immunized at birth both passively with immunoglobulin, and actively with vaccination.

Sexual partners and other household members need to be investigated to determine if they also require vaccination. As well as health care workers who come into contact with the patient or her body secretions are also at risk. If universal precautions are not in effect, then special care should be taken when exposed to secretions.

If the mother is negative, but her sexual partner or other close household contacts are HBsAg positive, then the newborn should be actively immunized, but passive immunization is not necessary.

VDRL: Refers to the Venereal Disease Research Laboratory screening for syphilis. A positive screen needs to be confirmed with a *treponemal*-specific test. Patients with active syphilis can transmit their infection to the fetus resulting in a variety of complications. A persistently positive antibody in a patient who was previously treated should prompt a review of the specific treatment provided to determine its adequacy as repeat treatment may be prudent. Sexual partners also need to be treated. A false positive VDRL also screens for anti-phospholipid antibody diseases, such as systemic *lupus erythematosus*.

Sickle cell: Refers to a sickle cell screen. Patients of African descent are at risk. In many cases preconceptual screening has been undertaken and this result should be noted. Both parents should be screened if they are unaware of their status. A fetus is at risk for sickle cell anaemia if both parents are carriers and appropriate genetic counselling and interventions may be considered.

HIV: Refers to screening for Human Immunodeficiency Virus antibody. An increasing number of women are seropositive for HIV despite the absence of any known risk factors. The rate of perinatal transmission is significant. Initiation of antiviral therapy can reduce the rate of transmission and ameliorate the disease in an infected newborn. Referral to a centre with a specific programme for HIV positive mothers should be considered. Women who decline to be tested need to be appropriately counselled and this fact recorded.

Last Pap: Refers to the last Pap smear obtained. Surveillance for cervical dysplasia is a normal component of well-health care. The frequency with which Pap smears should be obtained in an individual woman is determined by her history and is not altered by pregnancy. If a Pap smear is not indicated, then the date when the last one was obtained should be noted.

The method by which a Pap smear is obtained differs in pregnancy. Liquid based cytology has become the standard screening method and the kits contain a broom for collecting the specimen. The broom may be used prior to 10 weeks gestation. However, after 10 weeks, the deep bristles of the broom should not be inserted into the endocervical canal. The Ayre spatula, with or without the endocervical brush, that was previously used to collect the cells and to smear them onto a slide is no longer readily available. Two alternatives exist. One entails a modified use of the broom in a manner similar to the Ayre spatula. The bristles are not inserted, but rather the broom is firmly applied to the external *os* and ectocervic and rotated in a clockwise direction. A vaginal pool may also be obtained. The second method utilizes a snap off spatula (Medscand T12) that is used in the same manner as the Ayre spatula without an endocervical sampling. The normal eversion of the transformation zone during pregnancy facilitates appropriate sampling.

GC/Chlamydia: Refers to cervical swabs for *Gonorrhoea* and *Chlamydia*. Universal screening is recommended, but some clinicians elect to screen only patients believed to be at risk. The swab also may detect other cervical-vaginal pathogens that warrant treatment such as *Trichomonas*, and some cases of bacterial vaginosis.

Urine C&S: Refers to a mid-stream urine for culture and sensitivity. This is best collected around the sixteenth week and identifies asymptomatic bacteruria, which predisposes to pyelonephritis.

Prenatal Genetic Investigations: Refers both to screening and testing for chromosomal anomalies, especially trisomy 21 (Down syndrome) and trisomy 18, as well as open neural tube defects (ONTD), viz. *spina bifida* and anencephaly. All pregnant women should be offered screening. The chance of a fetus having an extra chromosome increases with maternal age. In addition, women who are 35 years of age or more on their EDB (not their age at conception) should be offered genetic counselling and the option of invasive testing. There are two invasive tests commonly performed: amniocentesis after 16 weeks, and chorionic villous sampling (CVS) between 10 and 12 weeks.

Paradoxically, most babies with Down syndrome will be born to women less than 35 because as a group they have a greater number of children. Screening methods can determine the probability of a Down syndrome and trisomy 18 in the fetus in this low risk population. Women whose screening test suggests a sufficiently high probability should be offered genetic counselling and the option of invasive testing.

Many women in the older age range may also choose to use screening results to help decide whether to undergo invasive testing. Screening does not look for all chromosome anomalies, and those in the most advanced age range should be aware of this.

Lastly, the risk for ONTDs is independent of maternal age.

There is value in knowing whether a fetus is chromosomally abnormal or has an ONTD even if the couple would not accept termination of their pregnancy. The parents can prepare in advance of the child's birth by learning more about the disorder and how to care for their newborn. In addition, obstetrical decisions may be altered by an awareness of the status of the fetus.

Screening tests entail the measurement of biochemical markers in the maternal serum either in the first or second trimesters, or in both trimesters. Some tests incorporate the ultrasonic measurement of the fetal nuchal translucency (NT). The NT measurement can be used only if the ultrasonographer is recognised to be part of the screening program. The accuracy of the tests is dependent on the correctness of the gestational age and a dating ultrasound should be obtained if other dating criteria are not reliable.

1. All women should be offered screening. Different screening tests are available and the appropriate test depends on the gestational age when the mother presents and what the local genetics centre offers.

If the women presents later than 13 weeks 6 days, then Maternal Serum Screening is performed ¹. This measures maternal serum alpha-fetoprotein (MSAFP), β -hCG, estriol, and Inhibin-A. Ideally the sample is obtained in the sixteenth week when the markers are sensitive and there is time to act on the result, but MSS can be performed from the 15 weeks 0 days until 20 weeks 6 days. The screen detects trisomies 18 and 21, as well as ONTD.

If the women presents before 14 weeks 0 days, there are three screening tests available ²:

- First trimester screening (FTS): this measures PAPP-A (Pregnancy Associated Plasma Protein A) and β -hCG in the maternal serum, and the NT in the fetus. It is measured between 11 weeks 0 days and 13 weeks, 6 days. It screens for trisomy 21, trisomy 18 and the ultrasound screens for anencephaly. It does not detect *spina bifida*. Compared to second trimester screening, it has a higher detection rate for Down syndrome, and a comparable false positive rate.
- Integrated Prenatal Screening (IPS): this is a combined first and second trimester test. In the first trimester, PAPP-A and NT are determined. In the second trimester, the biochemical markers used for second trimester screening are measured. IPS detects trisomies 18 and 21 and ONTDs. It has the highest detection rate and lowest false positive rate for Down syndrome of all the screens.
- Serum Integrated Prenatal Screening: this can be used when NT measurements are not available. A dating ultrasound is required. The same biochemical markers are measured as in IPS with NT, and the same disorders are detected. The detection rate for Down syndrome is a little lower and the false positive rate a little higher than with IPS with NT.

¹ The field of prenatal genetic investigation is a developing one. MSS is listed in the OAR and most practitioners understand this to be a triple marker screen. However, it has been replaced by quadruple marker screening in Ontario (Quad screening). In future revisions, this will be listed as STS (Second Trimester Screening).

²The following table summarizes the efficacy of the available screening tests.

| Test | Detection Rate | False Positive Rate | Number of amnios to detect one case of Trisomy 21 |
|----------------|----------------|---------------------|---|
| MSS | 75% | 8% | 85 |
| Quad Screening | 75% | 4.5% | 48 |
| FTS | 85% | 4.5% | 47 |
| IPS | 90% | 2% | 17 |
| Serum IPS | 85% | 3% | 26 |

In the event of a positive screen, a dating ultrasound should be obtained if it has not already been done. The result is recalculated only if there is a discrepancy of more than 10 days between menstrual dates and ultrasound dates. If the sample was taken too early in gestation, it should be retaken at the appropriate gestational age.

If the gestational age is confirmed, the patient should be referred to a genetics centre for consideration of invasive diagnostic testing with amniocentesis for Down syndrome or trisomy 18, or by detailed ultrasonography if the screen is positive for an ONTD.

2. Women who are going to be at least 35 years old on their EDB may elect to rely on one of the screening methods described above. However, they can be offered invasive diagnostic testing whether or not they elect to be screened and regardless of the result of the test. Both CVS and amniocentesis are suitable. In addition genetic counselling should strongly be considered in these patients as they are at risk for other autosomal anomalies that are not detectable by the screening methods, but can be detected by CVS and amniocentesis. Some chromosomal anomalies might be suspected on ultrasound due to the prevalence and severity of the birth defects that typify these disorders.
3. Some women will decline to be investigated for a variety of reasons, including a personal or religious objection to abortion (as there is no curative treatment for chromosomal anomalies), or a misunderstanding regarding the false positive rate (which is an inherent aspect of any screening test). These women should be counselled to consider MSAFP screening or ultrasonography for ONTDs. A diagnosis can often be confirmed by ultrasound, obviating the need for amniocentesis for amniotic fluid alpha-fetoprotein (AFAFP) and its risk of inducing a fetal loss.

Anencephaly is not treatable. *Spina bifida* warrants an alteration in the plan of care. Parents can be referred to a paediatric neurosurgeon during the antenatal period to plan out fully the details of the newborn management. Increased fetal surveillance near term can detect hydrocephalus, which may necessitate earlier delivery. Lastly delivery in a tertiary centre capable of caring for an infant with *spina bifida* may be desirable.

Twin gestations merit additional consideration. Screening for ONTDs is possible by adjusting the MSAFP for twins. Down syndrome screening is possible utilizing NT and maternal age, but this has a higher false positive rate than other screens. Screening for trisomy 18 is not possible.

Furthermore, the threshold age for amniocentesis or CVS is about 32 years because the probability of an anomaly is increased arithmetically since there is more than one fetus. Decisions regarding invasive testing for twins, or in the case

of higher multiples, should be made in conjunction with a genetics centre.

4. Some women will decline all investigations. It is important to document fully an informed refusal noting that testing and/or counselling was offered and declined. Also some patients present too late in pregnancy to be investigated and this should be indicated and discussed.

Revised Antenatal Record 2

Some of the information contained on the Antenatal Record 1 is repeated at the top of the Antenatal Record 2, *viz.*:

- the patient's name;
- the providers responsible for delivery of the woman and the care of the newborn;
- the family physician;
- the GTPAL;
- the Final EDB;
- the identified allergies and sensitivities;
- the list of medication;
- the ABO/Rh type.

These were chosen both for their importance, and for the convenience of being able to refer readily to them without having to check the Antenatal Record 1, and each can be transcribed directly from the first page.

By the time the caregiver begins to chronicle the progress of the expectant mother on the Antenatal Record 2, risk factors may have been identified. These should be listed on the Identified Risk Factors section, and a Plan of Management should be formulated and noted. Additional risk factors that are identified during the patient's subsequent visits, ultrasound(s), or additional Laboratory investigations should likewise be noted in the problem list, and the plan of management described.

Identified Risk Factors/Plan of Management

Modern obstetrical care is increasingly delivered by multiple providers.

- Obstetricians, family practitioners, and midwives more often than not are involved in call-sharing arrangements.
- Antenatal care is often delivered on a shared basis where one clinician provides the bulk of the antenatal care, and another assumes full responsibility for the delivery.
- An increased number of obstetricians and perinatologists have facilitated the referral and collaborative management of complex maternal and fetal conditions.
- Other specialists such as paediatricians, anaesthetists, internists and surgeons may become involved in caring for specific conditions.

- Nursing staffs and other allied health personnel who provide care need to be aware of any risk factors.

The Record facilitates the sharing of information in a standardized format. This is an essential component of this model of obstetrical care. This section is the only area where significant identified risk factors and their plan of management should be listed. It funnels the information gathered and documented throughout the Record to a single site.

Recommended Immunoprophylaxis

In addition to identifying risk factors in the section above, three common conditions requiring immunoprophylaxis are separately listed.

Rh neg. Rh-IG given yyyy/mm/dd: Refers to a woman who is Rh-negative and requires immunoprophylaxis at 28 weeks. The date the immunoglobulin is administered should be noted. This is intended to specify the date for routine prophylaxis. It does not refer to other factors that mandate additional Rh-IG, such as antepartum haemorrhage, invasive fetal procedures, and trauma. These should be recorded separately in the Subsequent Visits. Prior to administering Rh-IG, a repeat antibody screen should be done to exclude sensitization. The antibody screen may remain positive for up to twelve weeks in response to previously administered Rh-IG.

This is also intended to highlight the need for additional Rh-IG to be administered postpartum if the infant is Rh-positive.

Rubella booster postpartum: Refers to a rubella susceptible woman who should be actively immunized postpartum. There is a theoretical risk of congenital rubella syndrome developing in response to administration of the vaccine because it is a live attenuated vaccine. As the fetus is susceptible to the virus in the first sixteen weeks of pregnancy, the postpartum period is ideal for immunization due to the small probability of conception in the sixteen weeks following delivery.

Newborn needs: Hep B IG/Hep B vaccine: Refers to the needs of the newborn in a household where Hepatitis B exposure is possible. An infant born to a mother who is positive for HBsAg and potentially chronically infected is at risk for acquiring Hepatitis B. Passive immunization with Hepatitis B immunoglobulin (HB-IG) should be administered postpartum along with the first dose of active immunization with Hepatitis B vaccine. This is administered as a three dose series and is available free of charge from the local Public Health Department.

In households where close family members other than the mother are HBsAg positive, the newborn needs active immunization only.

Subsequent Visits

The usual timing for subsequent visits is every four weeks up to 28 weeks, every two weeks up to 36 weeks, and weekly thereafter. Extra visits may be needed for pregnancy

complications. Visits for reasons that are not related to routine antenatal care may also be needed and should be appropriately recorded. An additional Antenatal Record 2 can be used if more space is required, but if possible all the identified risk factors should be listed on the same page. A number of items should be recorded at all visits.

Date: Refers to the date of the visit.

GA (weeks): Refers to the gestational age in weeks based on the EDB. In some cases the EDB based on dates may be modified. As soon as the Final EDB is determined, the gestational age should be listed accordingly. Optionally the previously recorded dates could be circled or otherwise marked to indicate these referred to a preliminary EDB and are not synchronous with the Final EDB.

Weight: Refers to the weight obtained at each visit. If possible the same scale should be used and excessively heavy clothing removed. Weight gain can be compared from visit to visit. The appropriateness of the weight gain will be influenced by the body habitus, dietary habits and alterations made for pregnancy, as well as a variety of medical conditions including *hyperemesis gravidarum* and eating disorders. It may also reflect pregnancy-related disorders such as IUGR and hydramnios, although these are better determined by other means.

B.P.: Refers to the blood pressure. This should be measured in a sitting position with an appropriately-sized cuff placed at the level of the heart. The Korotkoff Phase IV sound (muffling) should be used for the diastolic pressure. Blood pressure tends to fall in a normal pregnancy, reaching its nadir in the eighteenth week, and slowly rising back to the pre-pregnancy level in the third trimester. The Canadian Hypertension Society Consensus Conference concluded that a significant elevation is best defined in absolute terms, *viz.* a diastolic pressure greater than 90 mmHg measured twice at least four hours apart. Elevation of the systolic pressure above 140 mmHg in the absence of a diastolic rise warrants close observation.

Urine Prot.: Refers to the measurement of urinary protein by dipstick. Ideally the patient should come to the office with a first morning urine. This is a screening test and an elevation of 1+ or greater need to be further evaluated by collection of a 24-hour sample. Proteinuria in excess of 0.3 grams per day accompanied by an elevated blood pressure is used in the classification of gestational hypertension. It also may signal the presence of renal disease.

Urine glucose is not recorded as it is not a useful parameter. It does not detect gestational diabetes, and is not a helpful monitor for pre-existing diabetes.

SFH: Refers to the symphysis to fundal height. It is measured from the pubis to the top of the fundus. This measurement is extremely operator-dependent and if possible it should be performed by the same provider with consistency in the positioning the patient. The fundal height can be quite variable depending upon factors such as racial and ethnic background, body habitus, parity, number of fetuses, and the weight of previous infants.

The change in the fundal height from one visit to the next is the most important aspect. An abnormal SFH may indicate abnormal fetal growth (IUGR and macrosomia) and abnormalities in the amniotic fluid levels (oligohydramnios and hydramnios).

Pres. Posn.: Refers to the presentation and the position of the fetus. The presentation is the more important of the two especially in the last month. Many clinicians do not record the presentation until the last month as intervention is not usually warranted until that time.

FHR/FM: Refers to the auscultation of the fetal heart or the presence of fetal movements. The fetal heart may be recorded as present or not, or the rate specified. Many clinicians diagram a grid to indicate where the fetal heart was auscultated. However this practice is somewhat dated as Doppler-based instruments determine the rate by detecting blood flow *per se*. This may be from the heart, fetal vessels, or the umbilical cord, unlike the fetoscope that detected the actual fetal heart sounds. Fetal movements can be reported by the mother, palpated and/or observed by the clinician. All indicate fetal viability.

Comments: Refers to any additional information relative to the condition of the patient and her fetus. Any aspects of the antenatal care, specifics of discussions, *etc.* may be recorded. The section also lists in grayed text a number of recommended tests and discussion topics that are time sensitive. This list is not all-inclusive and the recording of visits is not meant to necessarily align with these reminders. This is a convenient reminder for providers. The importance of most of the items is explained in its relevant section, and those that are not discussed elsewhere are detailed below.

Prenatal Education Classes are offered in a variety of settings, from weekly sessions over a number of months that also cover childcare, to a weekend review for seasoned parents. Prenatal education classes that provide accurate and current information promote a positive birthing experience. The parents' needs should be assessed and if desired, information should be given and arrangements made for them to attend an appropriate type of class. Ideally the class will finish four to six weeks prior to the Final EDB so that the information will be relatively fresh.

The **Review of Labour and Delivery plans** can take place throughout the pregnancy. It is suggested that discussing pain management in labour, admission and discharge planning as well as postpartum contraception should be initiated by the third trimester.

Growth Chart

The SFH recorded at each visit can be plotted along with the corresponding gestational age. The 10th, 25th, 75th, and 90th percentile lines are also drawn. The growth chart is most valuable in its depiction of the growth trend. Fetuses whose growth pattern varies from the hypothetical lines depicted should be investigated to exclude growth and fluid abnormalities.

It should be stressed that the growth lines are based on a population in California in the 1970s. The absolute values may not be directly applicable to an increasingly diverse ethnic and racial population, and the trend should be kept in perspective.

Ultrasound

The date and gestational age are recorded as well as the result of the scan. The GA is based on the Final EDB, not the gestational age derived from the scan, as if it is not known accurately, the first ultrasound scan will determine it.

A dating scan is usually done in specific circumstances including:

- supporting prenatal genetic investigations where the gestational age is uncertain due to irregular cycles or uncertain dates;
- assessing the nuchal translucency with IPS and FTS;
- assessing bleeding and/or pain in early pregnancy;
- excluding multiple gestation, especially in an ART-conceived pregnancy;
- assessing the uterus and/or adnexae.

A second trimester ultrasound is performed between eighteen and twenty weeks on a routine basis in most pregnancies in order:

- to confirm the gestational age;
- to exclude a multiple gestation;
- to examine the fetal anatomy;
- to localize the placenta and exclude placental praevia;
- to examine the uterus for fibroids and other anomalies;
- to measure the cervical length and characterize the internal os.

Assuming the initial 18-20 week ultrasound was satisfactory, there is no value in performing additional ultrasounds routinely, and they should only be done on an indicated basis, such as:

- to follow-up inadequately visualized fetal anatomy or a possible abnormality;
- to monitor growth especially in conjunction with an abnormal SFH, multiple gestation, maternal obesity, and a prior history of IUGR;
- to monitor the amniotic fluid level;
- to reassess the position of the placenta to exclude placenta praevia;
- to confirm or to exclude a malpresentation;
- to determine fetal well-being during a biophysical profile where warranted by other maternal or fetal conditions.

Additional ultrasounds can be documented either in the ultrasound section, or in the subsequent visits. Significant risks should be noted in the Identified Risk Factors.

Additional Lab Investigations

Hb: Refers to a repeat haemoglobin measurement. The haemoglobin will usually fall from the initial value because of the dilutional effect of the serum volume increasing more so than the red blood cell mass. An excessive drop suggests a deficiency in dietary iron and the patient may benefit from initiating or increasing supplementation.

ABO/Rh: Refers to the major blood groups. This may or may not be repeated with the third trimester blood work, but is rerecorded on the Antenatal 2 because of its importance and easy referencing.

Repeat ABS: Refers to a repeat antibody screen. This should be performed in an Rh-negative woman prior to her receiving RIG. Some practitioners repeat the screen in all women to exclude sensitization to atypical antigens that might not have been present in sufficient quantity to be detected on the initial screen.

1 hr. GCT; Refers to the one-hour glucose challenge test. In the absence of a randomized controlled trial, the Society of Obstetricians and Gynaecologists of Canada (SOGC) and the Canadian Diabetes Association (CDA) have made different recommendations.

The SOGC did not support universal screening, but recommended the one-hour GCT be selectively performed, *i.e.* in all women except those at low risk which it defined as:

- maternal age less than 25 years;
- Caucasian or member of another ethnic group with a low prevalence of diabetes;
- pregnant BMI less than 27;
- no previous history of gestational diabetes mellitus (GDM) or glucose intolerance;
- no family history of diabetes in a first degree relative;
- no history of GDM-associated adverse pregnancy outcomes such as an unexplained stillbirth, and neonatal hypoglycaemia, hypercalcemia, or hyperbilirubinemia.

The SOGC also acknowledged that a policy of nonscreening was acceptable, especially as it was practiced by relatively few obstetricians in a small number of centres.

The CDA recommended universal screening on the basis that a small but significant number of women with GDM would be missed by selective screening. Furthermore the selective screening method would only exclude 10 per cent of patients.

Both the SOGC and the CDA recommended first trimester screening in women considered to be at high risk for GDM. If the screen is negative, then it should be repeated at 24 to 28 weeks. The relevant risk factors include:

- previous diagnosis of GDM;

- previous delivery of a macrosomic infant;
- age 35 or older;
- BMI of 30 or greater;
- history of GDM-associated adverse pregnancy outcomes (SOGC only);
- repeated glycosuria in pregnancy (SOGC only).
- member of a high-risk population (*e.g.* women of Aboriginal, Hispanic, South Asian, Asian or African descent) (CDA only);
- polycystic ovarian syndrome and/or hirsutism (CDA only);
- Acanthosis nigricans (CDA only);
- corticosteroid use (CDA only);

The CDA also noted a further advantage of universal screening. GDM is a risk factor for the development of diabetes in later life. Women with GDM can be appropriately followed and their diabetes could potentially be diagnosed earlier.

Screening is performed by measuring a glucose level one hour following a 50-g oral glucose load. It is administered between 24 and 28 weeks, at any time of day, and the patient need not fast. If the value is between 7.8 and 10.3, then a two-hour glucose tolerance test is indicated. If the value is 10.3 or higher, it is diagnostic of GDM and the two-hour test is not necessary.

2 hr. GTT: Refers to the two-hour glucose tolerance test. This is performed when the one-hour test is elevated between 7.8 and 10.2. The test is performed by obtaining a fasting glucose, then administering either a 75 gram glucose load (CDA and SOGC) or a 100 gram load (SOGC only). Glucose is then measured after one and two hours. The majority of laboratories utilize the 75 gram load.

Gestational diabetes using the 75 gram load is diagnosed if at least two abnormal values are obtained: fasting glucose ≥ 5.3 mmol/l, one-hour ≥ 10.6 mmol/l, or two-hour ≥ 8.9 mmol/l. Impaired glucose tolerance is diagnosed if only one of the values is elevated. Women with uncomplicated gestational diabetes require dietary counselling, home glucose monitoring and increased fetal surveillance close to term. Inadequate control (persistent two-hour postprandial glucose of 7.0 or greater, or persistently elevated fasting glucose) necessitates insulin and further surveillance. Women with impaired glucose tolerance may also benefit from the same interventions.

GBS: Refers to screening for Group B *streptococcus*. Approximately 10-30% of pregnant women are colonized by GBS in the vagina or rectum. This can be transmitted to the newborn during labour and delivery, and can result in early-onset GBS infection that is manifested by sepsis, pneumonia, or meningitis, and can lead to death.

The incidence of early-onset GBS can be significantly reduced by the administration of antibiotics in labour. Two strategies have evolved regarding the prevention of GBS:

1. the risk-based approach; antibiotic treatment is initiated only if one or more of the following risk factors is present:

- prematurity less than 37 weeks;
 - prolonged rupture of membranes greater than eighteen hours;
 - intrapartum fever greater than 38°.
2. the culture based approach; all mothers have a combined lower vaginal and rectal swab between 35 and 37 weeks, and those identified as being GBS-colonized receive prophylactic antibiotics at the onset of labour.

In both approaches, treatment at the outset of labour is provided to women with a history of an infant with early-onset GBS disease, or with a history of GBS bacteruria in early pregnancy (which indicates a higher bacterial load). Adequate intrapartum chemoprophylaxis consists of at least one dose of intravenous penicillin (5 million units) given at least 4 hours prior to birth. If labour continues beyond 4 hours then penicillin (2.5 million units) should be administered every 4 hours until delivery. Clindamycin 900mg IV every 8 hours or erythromycin 500 mg IV every 6 hours until delivery are recommended for women allergic to penicillin, although this should be guided by the antibiotic sensitivity of the isolated strain.

A prior history of GBS-colonization is not an indication for prophylaxis in the current pregnancy, except when there was a previously infected infant. Although GBS is an endogenous organism in colonized women, the late trimester culture will reflect the bacterial load closer to delivery. For this same reason, cultures done remote from delivery are not predictive, whether positive or negative.

In the culture-based approach, GBS-negative women who develop chorioamnionitis or are suspected of being septic, *e.g.* maternal fever or fetal tachycardia, may benefit from broad-spectrum antibiotics, such as ampicillin, that are directed against other endogenous genital organisms. Women who labour prior to 37 weeks gestation, or whose membranes have been ruptured for more than 18 hours may also benefit from broad-spectrum coverage.

The culture-based strategy has proven to be superior and has emerged as the standard of care. It was recommended by the Canadian Task Force on Preventive Health Care ([www.ctfphc.org/Full Text/CTF_GBS_TR_final.pdf](http://www.ctfphc.org/Full_Text/CTF_GBS_TR_final.pdf)), and has been endorsed by the Society of Obstetricians and Gynaecologists of Canada, the American College of Obstetrics and Gynecology, the American Academy of Paediatrics, and the U.S. Centers for Disease Control.

Additional rows: Several blank rows were inserted so that subsequent tests of the clinician's choice could be recorded.

Discussion Topics

A number of topics are listed with check boxes. This is intended to facilitate the documentation of discussions that have taken place with the patient. It is not intended to be an exhaustive list, nor is it expected that all the items will need to be discussed with all patients. If desired the provider may write the date the discussion took place either adjacent to or on top of the item.

A Guide to Pregnancy Assessment Form

The Guide to Pregnancy Assessment is intended to be just that: a guide. It does not mandate referral to an obstetrician or a specialist in maternal-fetal medicine. The items listed are not all-inclusive.

The intent of listing these risks is to alert a provider to seek timely consultation if a condition arises with which he/she is not familiar and comfortable managing.

Postnatal Visit Form

The Postnatal visit form is found on the reverse side of the pink copy of Antenatal Record 2. The suggested history, examination and discussion topics are self-explanatory. An inquiry into urinary or gastrointestinal function should be made specifically, as many women are embarrassed and reluctant to note these problems voluntarily.

The pregnancy and in particular the labour and delivery should be reviewed with the aid of the appropriate record, especially if a different provider performed the delivery. Issues that could reoccur in a future pregnancy can be noted, such as whether a Cesarean section might be indicated the next time.

The postpartum visit is a good opportunity to review the pregnancy with a view to factors that could impact on the mother's health and future pregnancies. For example, mothers who had gestational diabetes should undergo repeat testing to ensure that her condition has not advanced to frank diabetes. If rubella immunization was not provided, the interval between pregnancy and the next conception is an opportune time to do so. The value of preconceptual folate can be reviewed and the importance of initiating it prior to conception emphasized. It is also a good time to counsel the mother regarding smoking cessation, and to re-emphasize the deleterious effects on infant and early childhood lung development.

Most of the psychosocial topics that were explored as part of the initial history should be re-examined during the postnatal visit. Sample questions that might be asked to elicit these factors were described above. The postpartum period may be a time of additional

strain due to the needs of the newborn. Postpartum depression, for example, occurs in 10-20 % of women and is often undiagnosed. Untreated, it may persist for many months to years. In addition to its effects on the woman, it may interfere with the relationship with her infant, causing delays in the child's cognitive and social development. Severe depression may have tragic consequences for both mother and infant if not detected.

It may be helpful to evaluate the mother's ability to cope with child care issues. In particular, women who are returning to work may wish to discuss their concerns about combining working and motherhood.

Summary

The Ontario Antenatal Record is designed to facilitate communication amongst the providers of maternity care. Its primary strengths are the recording of information in a standardized format, and the identification of risk factors and their plan of management. It also provides guidance with respect to appropriate and necessary prenatal care.

The Committee will continue to reassess the Record on a regular basis to ensure its ongoing accuracy and relevancy. The Committee anticipates the future development of the electronic format will further enhance the Record's utility

Feedback

Feedback to the OMA Committee on Antenatal Record is welcome and may be forwarded to John Wellner, Director, Health Policy, OMA Health Policy Department, 525 University Ave., Suite 300, Toronto, Ont., M5G 2K7; tel. (416) 340-2953 or 1-800-268-7215, ext. 2953; fax (416) 340-2238; e-mail: john_wellner@oma.org.