

Family-Centred Maternity and Newborn Care:
National Guidelines

— CHAPTER 9 —

Transport

Table of Contents

Introduction	5
Components of a Regional Referral and Transport Program	6
Personnel	7
Transport of the Woman and Her Unborn Baby	7
Indications for Transport	7
Contraindications for Transport	8
Transport Plan	8
Care During Transport	11
Care on Arrival	12
Suggested Management Plans	12
Neonatal Transport	12
Reasons for Transport	13
Transport Plan	14
Return Transport	15
In Conclusion	16
Bibliography	17
Appendix 1 — Maternal Consultation — Transfer Record and Neonatal Pre-Transport Information Sheet	18
Appendix 2 — Equipment for Maternal Transport	21

Introduction¹

The transport of pregnant women and newborns who are at high risk for problems is recognized as an essential component of modern maternal and newborn care. Indeed, the newborn's outcome improves if women are transported antenatally to a referral centre that can provide the required obstetrical care for her and after-birth support for her infant. Maternal transport with the baby in utero is therefore preferable to neonatal transport, and should be the primary goal.

The provision of family-centred care is particularly challenging when a woman and/or her baby are removed from either the original or the anticipated environment. On the one hand, the woman and her family understand that they will be cared for in a place with the resources to provide optimum care. On the other hand, it is an anxiety-provoking experience for a woman to be transferred from her community hospital — where she is familiar with the surroundings and the physician/midwife who has looked after her during her pregnancy — to a centre that may be in a larger community, to be cared for by people she has never met. Added to this fear is the woman's anxiety for herself and her baby's well-being. As well, she may have other children at home who require care and reassurance and for whom arrangements must be made. Furthermore, her partner may be unable to be with her, or be unable to visit frequently due to distance or family and work commitments.

It is equally difficult for a woman if her baby is sick and must be transported away from the place of birth, perhaps even out of the community. Separation from her baby is very difficult. Naturally, she will be anxious about the baby's well-being. Again, her partner or family members may be unable to be with her or to travel with the baby. The woman may therefore lack the emotional support she needs at this extremely trying time.

All these and other factors place significant stress on the woman and her family.

1. These guidelines are based on the Society of Obstetricians and Gynaecologists of Canada's (SOGC) 1992 *Guidelines for Physicians and Nurses in Maternal/Fetal Transport*; the British Columbia Reproductive Care Program's 1997 document *Maternal/Fetal Transport*; the Perinatal Education Program of Eastern Ontario's 1998 document *Maternal/Fetal Transport Guidelines*; the Reproductive Care Program of Nova Scotia's 1992 document *Maternal/Fetal and Neonatal Transport*; and the American College of Obstetricians and Gynecologists (ACOG) and the American Academy of Pediatrics' (AAP) 1997 document *Guidelines for Perinatal Care*. Readers are referred to their regional centres for specific transport information concerning their region.

The following specific principles of family-centred care are critical in these situations:

- Women and families need information about their circumstances; they need to be active participants in decision making.
- Women and families need continuous, supportive care from qualified personnel.
- Family members need to be together to whatever extent possible, and to communicate with each other and with health care personnel if separation becomes necessary.

Components of a Regional Referral and Transport Program

Although the majority of transfers are to a Level III centre, transfer to a Level II centre may be the most appropriate and allow the family to remain closer to home. Despite the most careful assessment, emergencies do occur — some not until the woman is established in labour, others after the infant is born. Provisions for neonatal transport are thus essential.

A regional referral and transport program consists of the following components:

- an assessment of problems that will benefit from consultation and/or transport;
- a continuum of care provided to family members as they move between the referring and receiving centres;
- equipment and personnel to facilitate transfer in a safe and effective manner as required;
- interagency collaboration and communication;
- facilitation of the family being able to remain together;
- frequent updates, information, and support for the family in this time of stress and grief;
- 24-hour availability of the program;
- reliable, accurate, comprehensive communication systems between referring hospitals and between the transport teams and hospitals, regarding response times, capabilities, and facilities;

- systems for the mother to return to her community when appropriate, without undue financial stress;
- registries of requests for transport and how they are handled, for purposes of quality audit;
- ongoing performance evaluations; and
- ongoing health care professional and public education initiatives.

Personnel

Transport personnel should have the collective expertise, technical skills, and clinical judgment to provide supportive care for the wide variety of emergencies that can occur during transport. Team members should be drawn from trained physicians, nurses, respiratory therapists, and emergency personnel. Composition of the transport team should be consistent with the expected level of need of the woman and/or baby being transported. It is the responsibility of all health care providers in the community to work together to ensure that the emergent needs of mothers and babies are met.

Transport of the Woman and Her Unborn Baby

Indications for Transport

The indications for maternal transport may relate to the woman or to the unborn baby. In general, transport should be considered when the resources for immediate and ongoing care of the woman and her unborn baby or infant in the local community are inadequate to manage the possible complications.

The indications for transport (following appropriate assessment by a physician) are twofold: when the mother or baby requires the advanced skills and resources of a Level II or III centre; and/or when it is expected that the infant will need care in a neonatal intensive care unit. The actual transfer will depend on the distances, the geographic and climatic conditions, and the clinical judgment of the presiding physician/midwife.

Specifically, the most frequent indications include:

- preterm labour;
- preterm rupture of membranes;
- severe pregnancy-induced hypertension or other hypertensive complications;
- antepartum hemorrhage;
- medical complications of pregnancy, such as diabetes, renal disease, hepatitis;
- multiple gestation;
- intrauterine growth restriction;
- fetal abnormalities;
- inadequate progress in labour; and
- malpresentation.

In situations where prelabour complications are expected, early consultation and/or referral to the appropriate centre for birth are recommended. Perhaps then the need for subsequent emergency maternal transport can be avoided.

Contraindications for Transport

Contraindications for transport include the following situations:

- the woman's condition is insufficiently stable for transport;
- the unborn baby's condition is unstable and threatening to deteriorate rapidly;
- the birth is imminent; and
- weather conditions are hazardous for travel or present dilemmas for transport (guidance should be sought from the regional centre in such cases).

Transport Plan

In all agencies, policies and procedures should be documented and put in place for the emergency care of the woman and her unborn baby or newborn. In the event of an emergency, prior arrangements should be made with a receiving health facility. A number of considerations go into the transport planning.

- Because this is an extremely distressing time for families, women and their families need the health care providers' full support during the

transfer experience; they also need good feedback and a full sharing of all available information. The woman and her family should be active participants in all decisions relating to transport. Sufficient time for questions should be provided and the woman and her family should be encouraged to express their fears and concerns.

Discussions with the women and their families are imperative for information sharing. It is particularly important to communicate the following information with absent family members before the transfer:

- the reasons for transport;
- the scheduled date, time, and duration of the transport;
- the destination of the woman and/or baby;
- the mode of travel;
- what will happen during transport (i.e. the type of care);
- the names of staff members who will accompany the woman and family;
- the visiting hours and telephone numbers of the receiving hospital;
- the anticipated length of hospital stay;
- travel directions/maps to receiving hospital by car, or information on other modes of transportation; and
- the accommodation options for family members.

It is important to have family members available at the destination. The woman's partner or another support person should be encouraged to accompany the woman (providing there are no insurance or legal ramifications). If this is impossible, families should be helped to travel to the destination in a safe manner. If the decision is made to drive but it causes the family too much stress during this difficult period, it may be preferable to have another person drive. The partner or support person should be encouraged to make accommodation arrangements in the city of the receiving hospital.

It is important to enable the family to remain together. The woman who has been transferred will need a strong support system.

- Transport requires prior discussion between the referring physician/midwife and the accepting physician. A detailed run down is required — of the well-being of both the mother and unborn or newborn baby; the stabilization of the woman's condition; and the transport plan itself.

- The health care providers in the referring and receiving centres must make a joint decision as to the mode of transport (road or air ambulance) and the need for accompanying personnel. The decision as to who should accompany the woman depends on her condition. The accompanying professionals should be able to assess the condition of the mother and her unborn baby, to respond appropriately to any subsequent changes and to conduct emergency birth. They should be trained to monitor and maintain infant body temperature, to perform infant resuscitation as well as adult and infant cardiopulmonary resuscitation, and to administer IV therapy.
- The proposed receiving hospital should document the request for transfer on a standardized form. Required information includes the names of the woman and physician/midwife, the reason for the transfer request, the current condition of the woman and her unborn baby, any decisions regarding treatment and transport, the type of health professional accompanying the woman/newborn, and the name and temporary address of the accompanying support person. For audit purposes, this documentation should be done whether or not the decision is made to transport the woman.
- The referring institution should complete a maternal transfer form that includes photocopies of the prenatal record, the pertinent hospital records, and the ultrasound scan reports. If unavailable at the time of transport, these documents should be faxed as soon as possible. (See Appendix 1 for sample forms.)
- The woman should wear an identification bracelet.
- The health status of both woman and baby should be fully assessed. Transport is not routinely recommended for a woman whose infant's gestational age is less than 22 completed weeks unless it is for maternal issues. (Readers should refer to the 1994 CPS/SOGC position statement *Management of the Woman with Threatened Birth of an Infant of Extremely Low Gestational Age* for guidelines concerning the care and support of women whose infants have a gestational age of less than 22 weeks, or 22 to 26 weeks.)
- Assistance should be provided for those interventions necessary for stabilization prior to transport (e.g. for the establishment of an intravenous infusion or the initiation of drug therapy).

The availability and functioning of all transport equipment should be checked before departure (see Appendix 2). Sufficient oxygen should be made available, allowing for a 50 percent margin of safety. For air transport, consideration should be given to administering oxygen during high-altitude flights.

Care During Transport

Care during transport should be individualized, depending on the nature of the problem and the distance and conditions of the transport. During transport, all assessments should be documented on the maternal transfer form. The following aspects of the woman's and family's care are very important:

- The woman requires continuous supportive care; her family needs continuing support as well. The woman will need information about her own and her baby's well-being. She will also need to have her questions answered.
- It is important for the woman to lie on her side. The position lessens the risk of supine hypotension and fetal hypoxia.
- Both the woman and unborn baby need to be monitored during transit. The frequency of monitoring will depend on their condition and the judgment of the attendant, but should include monitoring of:
 - uterine activity;
 - maternal blood pressure (using a digital readout sphygmomanometer or palpation of the brachial artery); and
 - fetal heart rate (noise levels will require the use of a battery-operated, ultrasonic Doppler fetal-heart detector).
- The woman may require supplemental inspired oxygen, particularly during transport by air.

The care of the mother and infant during transport is the responsibility of the referring institution, unless the receiving institution has sent a transport team.

Care on Arrival

When a woman and/or her family arrive at the receiving centre, a number of important components of care will need consideration.

- A unfamiliar centre with new, unknown care providers can be a difficult experience for the woman and her family. It is critical that the health care providers appreciate this and provide the necessary support. For example, it is essential to introduce the woman and her family to the receiving staff. If family members have not been able to accompany or follow the woman, they need to be called as soon as possible; they should be notified of the woman's arrival and the status of both mother and unborn baby.
- On arrival, a full assessment of the woman and baby should be done. Their clinical status should be discussed with the receiving staff. Accompanying transport personnel should participate in the care necessary to admit the woman to the unit.
- It is crucial that the referring physician/midwife, and the woman's usual physician/midwife (if different), be informed of the events in hospital, the outcome, and the postdischarge plans for both mother and baby (if she or he has been born).

Suggested Management Plans

In its 1992 *Guidelines for Physicians and Nurses in Maternal/Fetal Transport*, the SOGC suggests care protocols for three common conditions for which transport may be required: preterm labour, vaginal bleeding, and hypertension. Protocols for specific conditions are also outlined in the various regional/provincial guidelines. As well, the Canadian Paediatric Society (CPS) and the SOGC have developed guidelines for the care and support of women expecting an infant of extremely low gestational age (CPS and SOGC, 1994).

Neonatal Transport

For newborn transport, it is preferable that the transport team originate at the receiving centre. Staff members can then travel to the referring hospital and assume responsibility for the baby, including the necessary stabilization and actual care provided during the transport to the receiving centre.

During neonatal transport, adequate equipment must be available. The referring centre should request assistance/consultation as soon as it can, so that the transport team can prepare in advance.

Whether the transport distance is short or long, certain fundamental principles of neonatal transport apply. These fundamental principles include provision of warmth, stabilization by personnel with appropriate training and experience, and transport under controlled conditions.

Before transport, hospital personnel in the referring hospital should work with members of an external neonatal transport team in stabilization and care. Responsibility for the transport team should be clearly established — usually a physician in the receiving hospital is responsible after the team leaves the referring hospital. With or without a specialized transport team, however, responsibility for care should be clear at all times. Appropriate communication with the responsible physician should occur prior to departure for the hospital of destination. In addition, mechanisms should be available for communication related to unexpected problems that may occur en route.

Reasons for Transport

Neonatal transfer should take place (following appropriate assessment by a physician) in two instances: when the baby requires the advanced skills and resources of a Level II or III centre; and/or when it is expected that infant care in a neonatal intensive care unit will be required. The actual transfer, though, will depend on the distances and geographic and climatic conditions involved, as well as the clinical judgment of the presiding physician/midwife.

In effect, there are countless reasons for transport, specific to the baby and region. Some of the more common reasons for transport are:

- persistent respiratory distress;
- congenital malformations requiring special diagnostic procedures, treatments, or surgical care;
- sequelae of hypoxic ischemic events with persistent evidence of multi-system organ dysfunction;
- preterm birth/low birth weight; and
- severe infection.

Transport Plan

The decision to transfer an infant, based as it is on consultation between the referring and receiving physicians, requires a physician's order. As noted, all infants should be stabilized prior to transport. In most instances, it is ideal for the infant to remain at the referring centre. The receiving hospital's transport team or neonatal staff can then go to the centre, stabilize the infant there, and conduct the transport. A good deal of information must be collected prior to transport:

- Basic data for the tertiary centre (or transport team) need to include:
 - name of referring physician
 - name of referring hospital
 - name of infant
 - name of parents
 - date and time of birth
 - weight and gestational age
 - presenting/referral condition (See sample form in Appendix 1.)
- A summary of maternal and neonatal data needs to include:
 - *Maternal information*
 - maternal medical history
 - obstetric history
 - complications of pregnancy
 - history of labour and birth
 - *Neonatal information*
 - Apgar score at 1, 5, and 10 minutes
 - resuscitation efforts
 - current infant problems
 - present assessment of infant
 - necessity for IV lines
 - laboratory data, if available
 - medications given
- Copies of reports need to include:
 - all pertinent laboratory data
 - maternal and cord blood specimens
 - x-rays
 - photocopy of mother's and infant's charts, including antenatal record;
 - copies of fetal monitoring tracings

- Before transport, all necessary equipment should be checked for functioning. As well, the infant's identification band should be checked for accuracy and consistency with that of the mother. During actual transport, the infant must be kept in a warm transport isolette and monitored frequently (frequency to depend on the infant's condition and the attendant's judgment).
- During the period leading up to transport, it is critical that there be ongoing support of and communication with the mother and family. All information regarding reasons for transfer should be discussed and the parents involved in the decision-making process. Parents need full information about the tertiary centre. They also need information regarding travel to the centre and accommodation at or near the centre. Before transport, it is essential that parents have time with their baby. Every effort should be made to enable them to see and touch or hold their infant. As well, the parents should be given a photograph of the infant before transport.
- Arrangements should be made for the mother to be transferred to the hospital where the baby will be admitted. In all cases, parents should be informed and encouraged to contact the referral hospital concerning their infant's condition. Communication with the referral hospital should be ongoing so that information regarding the infant's health can be communicated to the parents, as well as to the staff who have cared for the infant.

Return Transport

In return transport, a mother and/or her baby, after receiving intensive or specialized care at a referral centre which has resulted in resolution of the original problem, return to the original or local centre for ongoing care.

Return transport is indicated when:

- the pregnant mother's condition has stabilized such that her treatment plan can be safely implemented at the referring (home) centre;
- the postpartum mother can safely return to her home community (but *only* if it is appropriate to return without her baby); and
- the infant may return to the referring community with a follow-up or treatment plan.

In Conclusion

Communication of events and/or plans is vital from centre to centre. Such communication should specify the treatments required, the equipment needed, the outcomes expected, any parent/infant special needs, specific follow-up plans, and the clinicians required.

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APPENDIX 1

Maternal Consultation — Transfer Record

Date Time

Health insurance #

Mother's name Birth date:
DAY/MONTH/YEAR

Mother's address
POSTAL CODE

Mother's telephone – Res Bus

Next of kin Relationship

Contact Names and Numbers

Family physician

Res Bus Fax

Attending physician

Res Bus Fax

Referring hospital

Tel Fax

Communication is important. Please include telephone numbers.

Reason for transfer

Age Term Pregnancies Living Premature Abortion Children

LMP EDC Weeks' Gestation

Ultrasound scans (or send copies):

Date Findings

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Membranes: Intact Ruptures

Nitrazine: Positive Negative

Onset of labour Frequency Dilatation

Bleeding Proteinuria Edema

Urinary infection Fetal heart rate

Temperature Pulse BP

Blood type Rh Rubella titre VDRL

Obstetric history (complete or send a completed, legible prenatal sheet)

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Medical history (allergies, infection, diabetes, anemia, hypertension)

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Medications

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Include ultrasound reports, x-rays, laboratory data, fetal monitor strip (if indicated).

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If ultrasound or other reports are not available at the time of transport, please fax these as soon as possible.

Observations in Transit

Departure time Family accompanying
Relationship

TIME	FETAL HEART RATE	BP	PULSE	RESPIRATIONS	CONTRAC-TIONS	COMMENTS
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.....
.....

Arrival time

Vital Signs on Arrival

Temperature Pulse Respirations

BP Reflexes Fetal heart rate

Labour status

Clinical condition

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Mode of transfer

Signature Date
(ATTENDANT DURING TRANSFER)

COMMUNICATION IS IMPORTANT

Referring physician and family would appreciate a telephone call from receiving physician.

Adapted from: Society of Obstetricians and Gynaecologists of Canada, *Guidelines for Physicians and Nurses in Maternal/Fetal Transport*, Ottawa, 1992.

Neonatal Pre-Transport Information Sheet

(The following outlines the typical information you should be prepared to provide over the telephone to the receiving hospital.)

Date and time of call Referring hospital

Referring physician's name

Neonate's Information

Name:

Diagnosis/Reason for referral

BIRTH DATE	TIME	SEX	BIRTH WEIGHT	WEEKS' GESTATION	APGAR 1 MINUTE	APGAR 5 MINUTE
.....

Resuscitation

Respirations:

Spontaneous: Yes No

Ventilated with bag: Yes No

O₂: Yes % No

Intubated:

Time ETT size

Suction mec below cords: Yes No

Compressions:

Yes No

Time initiated:

.....

Time stopped:

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Medications:

IV

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Congenital anomalies

Postnatal course

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Lab results

X-rays Cord/blood gases

Maternal Data

Name: LMP/EDC

Age: G T P A L

Blood group Rh VDRL Rubella HBsAG

TB HIV Group B Strep: Pos Neg Date

Past OBS History

Present Labour and Birth

Fetal monitoring: Yes No Internal External Auscultation Scalp pH

Length of labour: 1st stage 2nd stage

AROM SROM Date Time Colour Amount

Medications

Anesthesia

Type of birth: Vaginal Cesarean Presentation

Complications

Date Signature and title

Source: In *Perinatal Practice Guidelines* (PEPEO 1997), adapted from Children's Hospital of Eastern Ontario NICU Transport Log and Neonatal Pre-transfer Record, and Kingston General Hospital's work sheet, 1993.

APPENDIX 2

Equipment for Maternal Transport

BASIC EQUIPMENT

Check that all equipment is available and functioning before leaving the hospital. The equipment and kits should be ready at all times and all staff should know where they are located. Check with local ambulance to determine what equipment is available in the ambulance.

General Equipment

- Maternal transfer form
- Stethoscope
- Thermometer
- Emesis basin
- Flashlight
- Sphygmomanometer
- Doppler (battery operated or fetal stethoscope)
- Infusion pump (battery operated)
- Sterile gloves — three pairs, various sizes
- Peripads
- Sterile lubricant
- Antiseptic solution (e.g. Aqueous Savlon 1:100)

IV Fluids and Maternal Medications

- 1000 cc 5% D/W
- 1000 cc Ringer's Lactate
- Two Solusets
- Tape
- Tourniquet
- Intracaths: two of each #16, #18, #20
- Butterfly 2 of 21
- Assorted needles and syringes
- Alcohol swabs
- Five amps magnesium sulphate one gam/amp
- Two amps Vasodilan 80 mg/mL
- Four amps Syntocinon 10 units/mL
- Four amps calcium gluconate 10 percent in 10 mL
- Two amps hydralazine 20 mg/amp
- Two amps Valium 10 mg/amp
- Indomethocin

Emergency Birth Sterile Kit

- One pair scissors
- Two Kelly's forceps
- Six 4 x 4 gauze squares
- One small drape
- DeLee mucous suction or a mechanical suction (maximum pressure £100) and #10 French catheters
- Two cord clamps
- Two plastic bags (placenta and garbage)
- Blanket for baby
- Aluminum foil sheet

Infant Resuscitation

- Neonatal laryngoscope and small straight blade size 0
- Neonatal self-inflating bag and masks size 0, 1, 2 to administer 100% oxygen
- Clear endotracheal tubes with stylets and connectors size 2:5 to 4
- Epinephrine 1:10,000-1 mL ampoules x three or preloaded syringes
- Naloxone 0.4 mg/mL-1 mL ampoules x three or preloaded syringes
- 1 mL syringes
- 2 mL syringes
- #20 needles
- #25 needles
- Orogastic feeding tubes
- Elastoplast tape and scissors

Adult Resuscitation

- Oxygen — check availability and amount in ambulance
- Ambu bag and mask
- Airway #3

