

POSITION PAPER

ON

TRAINING FOR FAMILY PRACTITIONERS IN CESAREAN SECTION AND OTHER ADVANCED MATERNITY CARE SKILLS

This is a working draft of joint policy formulated by a special focus group for:

[Obstetrics Committee of The Society of Rural Physicians of Canada](#)
and
[The Maternity Care Committee of the College of Family Physicians of Canada.](#)

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INTRODUCTION

All women in Canada deserve timely access to advanced maternity care. For women in urban Canada this is usually a given. For the approximately one-third of Canadian women who spend their pregnancy in rural Canada, this represents a significant challenge.

In urban Canada family physicians and specialists work together. Rural Canada can be operationally defined as areas where generalists provide most or all medical services including maternity care (For a complete discussion of the definition of rural in the context of maternity care see reference ¹). As a direct result, rural family physicians have to provide a broader scope of practice than that of urban family physicians.

Most of the rural communities are too small and remote to sustain specialist obstetrical and anesthetic services for operative birth. There are only 38 obstetricians who practice in all of rural Canada. ² The vast majority of rural maternity care is done by the 1384 family physicians who provide intra-partum services. ² In rural hospitals advanced maternity care skills, including forceps, manual removal placenta, repair of severe lacerations, and cesarean sections, are usually performed by family practitioners. Their commitment, tenacity, and innovative solutions to training and funding obstacles have sustained maternity programs in rural Canada.

There are 576 hospitals that provide maternity care in all of Canada. When 40 percent of the 576 hospitals perform fewer than 20 cesarean sections each year ³, it is unrealistic to expect these services to be provided by specialist obstetricians. In 1991, family practitioners performed 4884 cesarean sections representing 7 percent of these procedures nation-wide ⁴. Quite simply, the historically based fact of cesarean section skills being within the scope of rural family practice has allowed rural Canada to continue to provide maternity care services. There is no practical alternative in the Canadian context.

Who are these family practitioners with advanced maternity care skill training? Some are international medical graduates. Many are Canadian-trained physicians who acquired their skills through a variety of training programs - some formally, such as the third year of a family practice residency program; some informally through special arrangements between a supportive physician, a teaching program, and a community with specific needs. Such training has been arranged in recent years at the Universities of Ottawa, Toronto, Manitoba, Saskatchewan, Alberta, Calgary and British Columbia and likely others.

There is a great need to sustain and expand availability of advanced maternity care. There are only 576 hospitals that provide maternity care in Canada. Even in this group 126 do not offer cesarean sections. ³ Rourke has found that there is significant attrition in availability of rural maternity units, family physicians attending births and cesarean section in rural Ontario. ⁵ Canadians need to know that well trained practitioners are available to offer these skills to the women who need them.

For this to happen there needs to be an integrated response to sustain the rural medical, nursing, administrative and physical environments where women give birth. Support of the rural health infrastructure is a complex undertaking that involves issues such as funding and organisation that are not addressed here. This paper is limited to discussion of training in forceps, cesarean and other advanced maternity care skills. However advanced maternity skills training could also include areas such as basic obstetrical ultrasound, obstetrical analgesia (including regional block). Such a program has been proposed by Larry Reynolds at the University of Western Ontario and has received wide support from the community, the university and the teaching hospitals. These skills can also be successfully combined with training in family practice surgery as in the new programs under development at the University of British Columbia and the University of Alberta. Companion training papers in family practice anesthesia and family practice surgery are being developed to compliment and support this document.

EVIDENCE-BASED OUTCOMES

Literature searches were performed on training general practitioners / family physicians for forceps, vacuum and cesarean sections on Medline to 1987. Additional literature was gathered, as described earlier ¹, on rural maternity care. Very few papers were found that listed rural operative delivery outcome measures. ⁶⁻⁹

The study by Deutchman et al ⁶ documented outcomes by family practitioners in two 35-bed rural hospitals over 10-15 years (631 cesarean sections). The cesarean section rate was 16%. Outcomes were compared with standards found in the medical literature for maternal mortality, Apgar scores, maternal transfusion, maternal urinary tract infection, endometritis, peritonitis, wound infection, reoperation, and injuries to bladder, urethra or bowel ¹⁰. In this limited sample, "By national standards, family physicians performed cesarean sections that produced infant and maternal outcomes of high quality..." ⁶

Kriebel and Pitts documented low levels of interventions, low complications, low infant mortality and good Apgar scores from 8 years of data (1,026 births) at a three-doctor, 25-bed hospital in Forks, Washington. ⁷ All doctors had been trained in cesarean section birth. Intra-partum transfers were 3% and infant transfers were 0.8%. The cesarean section rate was 8.9%. Forceps rates were 1.8% and vacuum 3.1%.

Cameron recently documented outcomes from the hospital in Atherton, Queensland from 1981 to 1990. ⁸ Atherton lacks specialist obstetricians, but five physicians had advanced training in operative deliveries and held diplomas of obstetrics. The patient population is mostly public with 10% aboriginal deliveries. From 2883 deliveries attended by 17 non-specialist physicians over 9 years, the section rate was 13% (Queensland average 18.4%). Successful VBAC trials were 58%. Gross perinatal mortality was 5.2/1000. When outcomes of antenatal referrals (1.6%) and intra-partum and postpartum transfers (3.8%) were factored in, the perinatal mortality (9.6/1000) compared favorably with the rates for the state of Queensland as a whole (13.5/1000).

In Northern Ontario, Black and Fyfe did a population based study of 24,524 births. ⁹ They found that women from the 11 communities with cesareans not provided by obstetricians tended to have the lowest perinatal mortality (10.4/1000) of all types of community studied. ⁹ Instrumental vaginal delivery rates were 7.7%. The cesarean section rate was 14.2%.

We anticipate that the collaborative process among the Society of Rural Physicians of Canada (SRPC), and the College of Family Physicians of Canada (CFPC) will encourage the establishment of the perinatal population-based databases which are needed to further research rural maternity care. The Canadian Perinatal Surveillance System (CPSS) is also beginning to address similar issues.

POTENTIAL BENEFITS TO RURAL WOMEN AND THEIR BABIES

As maternity services or rural hospitals close, rural women are being denied the choice of delivering in their home community hospitals. In the Joint Position Paper on Rural Maternity Care ¹ we reviewed and confirmed the evidence that women in rural communities achieve better outcomes when supported by local intra-partum care programs regardless of whether there is on site access to operative birth. ^{9,11-13} Clearly, a limited rural maternity care program is superior to no maternity care program. Are there additional benefits for women in rural maternity care settings which enjoy local access to advanced maternity care skills?

In Black's study of outcomes in Northern Ontario, the lowest perinatal mortality rates were obtained by Level I hospitals with operative delivery services provided by non-specialist medical staff. ⁹ However, the infrequency of perinatal mortality requires larger numbers than were available to Black for these differences to pass significance tests. Until better evidence becomes available, we recommend that it is essential for rural communities which presently have cesarean section capability to maintain this service.

A central component to rural living is the sense of belonging to a community. While rural women will always be able to travel out of the community to give birth, many will not want to. It is clear that the simple presence of local instrumental birth options such as forceps, vacuum and cesarean will reduce significantly the need for ante and intra-partum transfer. Without access to local operative birth and with careful risk management approximately 80 per cent of rural maternity patients can *anticipate* a birth in their community hospital. Because of emergent intra-partum risk and transfer, the proportion who *deliver* in these hospitals falls to 60 per cent.⁹ With access to local operative birth, these communities will deliver more than 90 percent of their maternity patients.⁷⁻⁹

Some obstetrical complications cannot be transferred because complications of childbirth are mostly unpredictable. Natural disasters (e.g. abruption, cord prolapse, fetal hypoxemia, etc.) will occur in rural maternity care practices. In the Joint Position Paper on Rural Maternity Care we recommended a single standard of care for low risk maternity care across urban and rural Canada. Ideally, this requires that all women have local access to operative birth.

Independent of outcomes and standards, inaccessibility to advanced maternity care skills puts in question the survival of rural maternity care programs. While many (125) rural communities continue to provide intra-partum care without cesarean section capability, they do so under considerable stress. In a study of outcomes of rural units in Washington state, Nesbit et al found that communities that could and did handle most of their maternity care had little attrition of physicians attending births (<3%/yr.).¹² The most vulnerable communities were those where less than a third of deliveries were occurring locally. These communities had attrition of doctors attending births of 27%/year.

Without the special anesthetic and surgical skills to intervene operatively, health care professionals struggle with an ongoing crisis of confidence in their ability to manage the broad range of maternity situations they might encounter. In other words, regardless of good outcomes in rural maternity, we face continuation of the erosion of choice for rural women as these programs close for reasons of occupational stress, crisis of confidence, perceived medicolegal risk and even hospital budgetary considerations.

SCOPE OF PRACTICE

Concern has been expressed about providing short training programs involving surgical and technical skills. This position has been taken by some because they believe these technical and surgical procedures can only be performed safely by those with a broader base of training achieved in an extended residency training program i.e. the specialty training program is indivisible.¹⁴

The evolution of the delivery of medical care in rural settings would refute this concern. Rural doctors give anesthetics¹⁵, manage trauma^{16,17}, give thrombolytics for myocardial infarction^{18,19}, treat pneumonia²⁰, and perform cesarean sections.^{6,9,10} It is recognized that in those clinical situations requiring technical/surgical skills in the rural setting a number of cases are transferred out for specialist consultation or management but many, if not most, are handled locally. Available data are limited but they do show that these cases can be handled appropriately in rural settings.^{6,9,10,15-20}

Many rural family practitioners are very well trained in the knowledge base of maternity and neonatal care and the indications for operative birth. What is required for some, is training in the specific procedures of operative vaginal birth and cesarean section which can be performed with good outcomes by non-specialist family practitioners. This can only be achieved through appropriate and accredited training programs made available to those family physicians who wish to practice in a rural setting and provide these expanded roles of practice to the community which they serve. The knowledge base taught in any such program should be of the same quality as currently exists within many training programs in family medicine and within obstetrics and gynecology. Family physicians trained through these accredited programs should be privileged to practice their expanded roles. This position is supported by the American Academy of Family Physicians (AAFP) and the American College of Obstetrics and Gynecologists (ACOG) who have advocated that "Privileges should be granted on the basis of education,

experience and documented competence, not solely on the basis of board certification, fellowship in ACOG, membership in other organizations or the physicians rank or tenure ²¹".

PATIENT SELECTION AND REGIONALISATION

We emphasize that the capability to perform operative deliveries locally does not imply that all patients requiring an operative delivery can or should be delivered locally. The relevant model is the larger perinatal system where a proportion of the pregnant population is identified as high risk and transferred for birth to the closest centre competent in the level of care that the woman or her unborn child requires. The same principles of risk management and regionalisation apply to patient selection for local operative birth as apply to the perinatal system as a whole.

Not every community has the will, resources and the anesthetic and nursing support required to sustain a local cesarean section option. Cesarean sections require a health care team approach with a high intensity of commitment and resources. Many rural communities will practice maternity care at a lower level of intensity and refer and transfer many women for birth elsewhere. We are convinced ¹ that this can be done safely provided that the patient selection process is effective and backed up by an organised audit and feedback program.

TRAINING

While there is continued debate in Canada about what constitutes an appropriate basic maternity care experience for all trainees (setting, role models, number of months), this debate should not distract from a critical need to provide appropriate experiences for those who will in fact serve rural and remote communities.

The training programs for advanced maternity care skills, including operative birth, must appreciate the two different groups of physicians seeking entry into these programs. Firstly, some family medicine residents, with a commitment to rural practice, will attempt to acquire these skills as an add-on to the current 2-year program in family medicine. Several Canadian medical schools have already instituted formal programs to accommodate these residents. Any program to enhance procedural skills must also produce a sophisticated "consultant family physician" who can act as a resource to his or her community. This implies not only procedural skills such as forceps, vacuum extractions and cesarean sections but a broad knowledge of the conduct of normal labor and the means to correct abnormalities of labor.

Several medical schools have provided training in advanced maternity care skills in the third year of a family medicine residency. Efforts to offer training programs for "re-entry" family practitioners trying to upgrade their existing skill base have been less successful. While there have been several informal and ad-hoc training programs to try to meet these needs, very few have survived for any length of time. They have suffered from problematic barriers to access - both financial and geographic - as well as from considerable skepticism on the part of specialists who have been reluctant to participate in the production of what some feel is a less than complete specialist.

Re-entry physicians, however, are in a unique position. They have a reality-based knowledge of the actual needs of their community. Their request for advanced training represents a partnership with their community rather than a personal need. A successful program to enhance their skills may stabilize their community's maternity care capability--preventing closure of services and/or enhancing the community's maternity care capability, both leading to improved outcome.

Some well-trained international medical graduates may require only a short period of training for orientation to Canadian standards. The evaluative process would allow for validation of their knowledge and competence.

HOW MUCH IS ENOUGH

The amount of training required varies with the pre-existing capabilities of the student, their own capacity to learn, and the anticipated role that these physicians will serve in their communities. Any training program must be sufficiently flexible in duration and curriculum to accommodate the breadth of talent and needs in rural Canada.

There is little information that describes the learning curve for a family doctor to acquire advanced maternity care skills. For advanced maternity care skills one example comes from the Saskatchewan program which "suggests" 20 cesarean sections performed by the family practitioner with his/her involvement in another 30.²² This figure was derived from review of the literature and evaluations of first year obstetrics and gynecology residents. The American ACOG-AAFP Core Curriculum specifies 10 or more cesarean sections in a 3-month training block.²¹ The Royal Australian College of Obstetrics and Gynaecologists (RACOG)-Rural Doctors Association of Australia (RDAA)- Royal Australian College of General Practitioners (RACGP) curriculum suggests 6 months of training and a minimum of 23 cesarean sections as primary surgeon.²³ An American study noted that the training volumes for family doctors who currently perform cesarean sections ranged from 25 to 100 with the average completed in training to be 46.⁶

From this confusion of numbers based mostly on opinion, what can one learn? Physicians wishing to undergo training should realize that there is no set number, but that acquiring advanced maternity care skills is a task for which a significant commitment is required. Competency can only be based on measured proficiency in the procedure and not numbers. For a few physicians, mastery will come relatively quickly but others might not be ready for independent practice even after the suggested number.

MAINTENANCE OF COMPETENCE

Numbers

There is little in the literature relating to volume of advanced maternity procedures other than perhaps cesarean section. Ontario general practitioners / family physicians who do cesarean sections do an average of 15 of these procedures annually.²⁴ Research evidence shows that family practitioners who have acquired competence in cesarean section can maintain their skills with relatively few annual cases - 5 to 22 cesarean sections per year.⁶ This fits with research that suggests that it is the quality of the training, and not the numbers performed annually, which preserves the skill base.

"There is little to suggest that the psychomotor skills that are important in the practice of procedural medicine will be lost if they are not practiced regularly. The extent to which the skill was practiced during the initial learning phase is likely to be of greater importance. The more thorough the initial learning and the more overlearning [repetition past the point of having learned the skill] that occurs, the more resistant to forgetting the skill appears to be."²⁵

The SOGC Guideline for general competence in maternity care does not specify an absolute number of deliveries to maintain competence. Rather, they encourage a lifetime commitment to audit, review, and continuing professional development. We recommend this same approach for

trainees in advanced maternity care skills.

Professional Development and Continuous Quality Improvement

Once trained, these rural family practitioners with advanced maternity care skills require continuing professional support and education. We might learn much from the history of training programs for rural family practice anesthesia. These physicians are superbly trained but leave the university without plans for support to sustain their competence, refresh their clinical skills, and to retain them in rural clinical practice. Once trained, they are "orphaned".

Although specialists provide the training, these graduates have no home in the department, nor in the specialist society, nor in the Royal College. Although trained in family medicine, their continuing educational needs in anesthesia and critical care are not usually attended to by events organised by the departments or the College of Family Physicians. As a result, opportunities for continuing education are scarce. The trainees feel isolated. Occasions for interaction, shared experiences, and mutual support are rare or nonexistent. Burn-out, the subsequent exit from anesthesia and/or rural practice, is frequent.

If we are to succeed with formal programs to train maternity care providers with advanced skills, we must anticipate and provide for the continuing education, organizational needs, and professional support of the graduates. We considered several possibilities. Each of these programs has a large potential contribution to make in the continuing support and development of rural family physicians with advanced maternity care skills:

1. University and hospital departments of obstetrics and gynecology might, on an informal or formal basis, open their clinical practices to rural family practitioners wishing a short opportunity to refresh their training in advanced skills.
2. The Curriculum (Appendix) proposes that graduates continue to record their clinical experience in their log books and that this be reviewed every 5 years. This review should be educational, helpful, and non-threatening. This suggests some participation by the rural faculty of family medicine and obstetrics and gynecology without inclusion of the licensing body.
3. The Anesthetic Services Program Encompassing Nova Scotia (ASPENS)²⁶ is a voluntary peer-reviewed program, funded by the provincial Department of Health, within which an anesthetic department in a community hospital could be supported and peer-reviewed. Its objectives-
 1. Provide a peer review system for departments of anesthesia in Nova Scotia hospitals
 2. Maintain a resource library of information relevant to anesthesia
 3. Have a "hot line" system for urgent and emergency consultation, by telephone, for problems of patient management
 4. Provide advice regarding
 1. the purchase of new equipment,
 2. problem solving of malfunctioning equipment, and
 3. the development of a mechanism for urgent repairs and maintenance
 5. Promote and coordinate access to continuing medical education

Individual training programs should be encouraged to select that which seems most appropriate. However, we recommend that the accreditation of these programs should require that some formal maintenance of competence programming be initiated and subject to periodic evaluation.

BARRIERS TO ACCESS

Earlier attempts to formulate training programs in advanced maternity care skills have struggled with formidable barriers to access. We propose to overcome these barriers as follows:

Time Frame

A specific educational objective should be attainable within a reasonable time frame. Duration of training and volumes of experience should be appropriate to an individual's prior training and experience. This is the essence of a competency based curriculum.

Financial

Compensation, both to the preceptors and their departments, and to the applicants who have interrupted their income flow should be provided by provinces within their rural incentive programs.

Geography

Physicians leaving their homes and families need to be able to access training within some reasonable geographical proximity to their own communities. For example, the Saskatchewan program provides for a re-entry candidate to initiate a mentorship with a physician who performs cesarean sections in their own community.

INTERNATIONAL GRADUATES

Canadian family practice graduates with advanced skills training in any rural discipline are in short supply. As a result overseas recruiting has often been the "safety valve" used by rural and remote communities to meet local health care service needs. These international medical graduates are finding it increasingly difficult to get access to Canadian certification or even entry into the country. Until an adequate supply of Canadian trained physicians are available, care should be taken not to exclude these practitioners.

Due to the heterogeneity of foreign training it has been particularly difficult to evaluate these physicians for hospital privileges in advanced procedures. In the interest of providing a common standard of maternity care, a common evaluative process should be made available for practitioners to help them obtain appropriate hospital privileges. Again the Saskatchewan program illustrates one solution to this problem.

THE SASKATCHEWAN PROGRAM

In 1991, Saskatchewan was aware that rural doctors with advanced maternity care skills were nearing extinction. Most of those physicians trained over 25 years ago. They generally worked in rural locations where regional population was not sufficient to support specialist programs. In some locations, these family practitioners worked with a solo consultant so that the consultant did not work 24/7/52/365. Had the consultant been forced to work these hours he or she would have, in all likelihood, abandoned the community.

A multidisciplinary committee was conceived under the auspices of the College of Physicians and Surgeons of Saskatchewan (CPSS) to develop a "Program of Enhanced Obstetrical Performance for Family Physicians" that is offered in three different ways.

1. As an add-on to the current 2-year program in family medicine.
2. As a program of 3 to 12 months at one of the teaching hospitals for a currently practicing doctor.
3. As a community apprenticeship program working with an appropriately qualified community-based tutor.

All candidates are independently evaluated at a teaching hospital following their training. Training is assumed complete. For their final evaluation candidates demonstrate their competence in 10 cesarean sections. Successful candidates are awarded recognition of their advanced level of performance by a letter from the University of Saskatchewan Faculty of Medicine. Through an agreement with the CPSS, this process allows for credentialling at any rural Saskatchewan hospital. Maintenance of competence requires a minimum annual performance. If there is an insufficient number of cases locally, a physician may arrange brief refresher courses at a large center.

The significance of the Saskatchewan program cannot be overestimated. For the first time in Canada, following a model developed long ago in anesthesia, there is a formal training program in advanced maternity care skills. The training program is supported by all and endorsed by the licensing body. It is accessible to both family medicine residents and re-entry doctors. It attempts to reduce or eliminate most,

if not all, of long-standing barriers to access. While individual academic centres might wish to modify some elements of this program, the basic principles of access, training, education and evaluation seem to be generic.

SUMMARY

Advanced maternity care skills, including operative birth, belong historically in the scope of family practice. Clearly this is appropriate. Family practitioners who perform cesarean sections can provide outcomes that meet or exceed national standards. Communities with local access to advanced maternity care skills can sustain local maternity services. Access to local advanced maternity care skills should be an expectation for all Canadian women anticipating childbirth.

What is required is a joint commitment from the disciplines of family medicine and obstetrics and gynecology to design and deliver formal, accessible training programs for advanced maternity care skills, including operative birth. The CFPC has an obligation to rural women and their families to accredit these programs. Academic departments should organise these programs, health ministries should fund the training, and the provincial licensing authorities should support this work.

RECOMMENDATIONS

1. Existing centers with cesarean section capability should work to sustain this service.
2. Every woman who can anticipate a safe birth in a rural community should be able to be supported by physicians with local access to advanced maternity care skills, including, where feasible, cesarean section.
3. The principles of risk management, regionalisation, disclosure, informed consent, and patient choice in the Joint Position Paper on Rural Maternity Care ¹ apply without qualification to rural maternity care providers who successfully acquire advanced maternity care skills.
4. Advanced maternity care skills, including operative birth, are included in the scope of rural family practice.
5. Training in advanced maternity care skills is the joint responsibility of the university departments of family medicine and obstetrics and gynecology.
6. The departments of family medicine need to play the lead role in negotiating these training programs with their obstetrics colleagues, the universities, provincial licensing authorities, and the funding authorities.
7. These training programs should be accredited by the CFPC.
8. Family physicians who obtain advanced training in maternity care should have a lifetime commitment to audit, review and continuing professional development.
9. Accreditation of training programs should require that formal programs for the support and continuing professional development of the graduates of these training programs be in place and evaluated on a regular basis.
10. Training should be accessible to third year family medicine residents and to re-entry physicians. In principle, subject to availability of mentors and teaching opportunities, these skills could be acquired in a teaching centre, a regional hospital, a rural hospital, or a combination of sites.
11. Training programs in advanced maternity skills for rural family practitioners should have a formal realistic mechanism for the evaluation and certification, that includes the observation of in-hospital work, of physicians who received their training outside of Canada.
12. Applicants for training should be evaluated for previous training, existing skills and community resources and support. The proposed duration and scope of training should be sufficiently flexible to meet the needs of individual trainees and communities.
13. Membership in the CFPC or the RCPSC should not be a factor in the selection process. In particular, for re-entry physicians, neither prior training in family medicine, nor membership in the CFPC shall be a prerequisite.

14. Until an adequate supply of Canadian trained physicians are available, care should be taken not to exclude entry of international medical graduates with training in advanced skills.
15. Physicians who successfully acquire certification in advanced maternity care skills require assurance that these skills will be recognized by provincial licensing bodies and by hospital boards.
16. Funding authorities need to provide an appropriate level of financial support to the applicants, the preceptors, and the departments of family medicine and obstetrics and gynecology.
17. A continuous audit and quality improvement program is a necessary adjunct to training programs in advanced maternity care skills.
18. The Curriculum for Advanced Skills in Maternity Care for Family Physicians ([Appendix](#)) is recommended as one example of an appropriate, generic, and inclusive training program.

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APPENDIX - A Proposed Curriculum for Advanced Skills in Maternity Care for Family Physicians.

The following represents a suggested curriculum and evaluation methods to teach physicians advanced maternity care skills including operative birth.

Candidates

- Rural generalists who require operative birth capabilities

- Existing doctors who wish certification of their existing skill set in operative birth
- FP residents as an add on to a two year basic family practice residency or a rural family practice residency

Course

The teaching of procedural medicine should happen within the larger cognitive context of the indications, options and complications of these procedures. In addition, successful completion of the curriculum will require the candidates to demonstrate their familiarity with the principles of risk management, the CFPC training standards for maternity care ²⁷ and the relevant guidelines endorsed by the CFPC, SOGC, and SRPC.

Knowledge Component

- Indications for cesarean section
- Options to cesarean section
- Risk management
- Audit and quality assurance
- Conditions that increase risks of operative complications including
 - preterm cesarean section
 - grand multip
 - placenta previa
 - placenta accreta
 - repeat cesarean section with extensive adhesions
 - morbidly obese patients
 - foetal abnormalities
 - maternal coagulopathy
 - multiple gestation
- Complications of cesarean sections
 - injury to bowel or bladder
 - extension of uterine incision into uterine arteries, cervix or vagina
 - uterine atony
 - uterine infection
 - wound hematoma or infection
 - coagulopathy or thromboembolic disease

Core Procedures

- Cesarean sections (assisted) 15
- Cesarean sections (completely done) 25
- Repair of bladder *
- Mid-cavity (non-rotational) forceps 10
- Vacuum extraction 10
- Repair of 4th degree tear *
- Manual removal of retained placenta *
- Manual rotation *
- Treatment of obstetrical emergencies *
- Neonatal intubation *
- Umbilical catheterisation *

() indicates knowledge of principles and as much experience as possible*

Optional Procedures

- Twin birth 3
- Internal version *
- Breech presentation 5
- External version 5
- Tubal ligation 5
- Repair of lacerated cervix *
- Repair of bowel *
- Basic obstetrical ultrasound *
- Obstetrical analgesia including regional block *

() indicates knowledge of principles and as much experience as possible*

Logbooks

An integral part of the ongoing and exit examination is based on logbooks of procedures. Each candidate will keep a logbook of procedures done. For operative birth, the following information will be kept as appropriate

- Case number (as on the hospital chart)
- Procedure (e.g. lower uterine segment cesarean section)
- Level of responsibility (e.g. primary surgeon)
- Indication (e.g. fetal distress)
- Complications (if any)
- Blood loss (Hgb preop and 2nd day, units transfused if any)
- Post op fever (if any, in degrees Celsius)
- Apgar scores, cord gases and fetal outcome

Evaluation

All candidates will be evaluated by standardized criteria. All candidates will undergo a continuous formative evaluation by their supervisor during training. When the required volume and competency levels have been achieved the supervisor will recommend the candidate for an exit evaluation. Each candidate will be tested for competency in operative birth by an outside examiner. The exit evaluation is in three parts.

- **ORAL EXAMINATION:** Each candidate will submit his or her logbook. The examiner will pick a number of charts for the candidate to bring to the examination. The examiner will use a review of these charts as a basis for discussion.
- **WRITTEN EXAMINATION:** Written questions will assess cesarean section and any other skills for which the candidate is being tested.
- **PRACTICAL EXAMINATIONS:** The candidate will be observed performing operative birth.

Maintenance of Competence

As an adjunct to a program to maintain their competence in advanced obstetrical skills, all trainees are required to continue to record their clinical experience in their logbooks. A formal review of this experience should be conducted every 5 years.