

Obstetrics Services in Canada Advancing Quality and Strengthening Safety

A collaborative report from:
Accreditation Canada
Healthcare Insurance Reciprocal of Canada
Canadian Medical Protective Association
Salus Global Corporation



Obstetrics Services in Canada: Advancing Quality and Strengthening Safety

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How to cite this document:

Accreditation Canada, the Healthcare Insurance Reciprocal of Canada, the Canadian Medical Protective Association, and Salus Global Corporation. (2016). *Obstetrics Services in Canada: Advancing Quality and Strengthening Safety*. Ottawa, ON: Accreditation Canada.

Also issued in French under the title:

Les services d'obstétrique au Canada – Faire progresser la qualité et renforcer la sécurité.

About the contributing organizations



Accreditation Canada

Accreditation Canada is an independent, not-for-profit organization that accredits health care and social services organizations in Canada and around the world. Its comprehensive accreditation programs foster ongoing quality improvement through evidence-based standards and a rigorous external peer review. Accredited by the International Society for Quality in Health Care (ISQua), Accreditation Canada has been helping organizations improve health care quality and patient safety for more than 55 years.



HIROC

The Healthcare Insurance Reciprocal of Canada (HIROC) is a non-profit insurance reciprocal owned and governed by over 700 health care organizations across Canada. It was started in the 1980s when health care organizations were unable to find reasonably priced insurance in the commercial marketplace. The reciprocal/cooperative model allows for pooling of data across multiple similar organizations, sharing of lessons learned, and collective pressure exerted by members to implement effective risk management programs that reduce injury.



CMPA

The Canadian Medical Protective Association (CMPA) is a not-for-profit association which provides medical-legal protection to approximately 95,000 Canadian physicians. The CMPA multidisciplinary teams collect and analyze medical-legal information to determine risk trends. This contributes to the extensive knowledge base on which the Association's professional development programs for physicians, education materials, and policy positions are built.



Salus Global Corporation

For more than 14 years, Salus Global Corporation has been recognized as the world leader in helping health care organizations achieve better clinical, economic, and operational outcomes. A specialty consulting and implementation firm, we help health care organizations improve performance and quality outcomes through increased interprofessional collaboration.

Acknowledgements

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The partner organizations acknowledge and thank the following individuals for their contributions:

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Executive summary

The quality and safety of the obstetrics services provided to Canadian families deserve focused attention, given that there are around 380,000 births annually in Canada (Statistics Canada, 2015) and childbirth is the main reason for hospital stays (Canadian Institute for Health Information, 2014).

Obstetrics Services in Canada: Advancing Quality and Strengthening Safety is a collaborative report by Accreditation Canada, the Healthcare Insurance Reciprocal of Canada (HIROC), the Canadian Medical Protective Association (CMPA), and Salus Global Corporation that profiles the quality and safety of obstetrics services¹ in Canada from 2004 to 2015. Each organization is committed to health care safety and improving the performance of health care teams. Together, these four national organizations are using their detailed data to report on strengths, issues, and challenges in obstetrical care today.

Accreditation Canada client organizations showed a high level of compliance with the *Obstetrics Services Standards* from 2012 to 2015, particularly in the areas of:

- Timely, accurate, and appropriate client assessment
- Safe and effective use of obstetric and postpartum devices and equipment
- Keeping client information accurate, accessible, up to date, and secure

By contrast, there are opportunities for improvement with regard to having a policy and procedure for:

- Sponge and needle counts for pre- and post-vaginal births
- Identifying indicators to monitor progress for quality improvement objectives
- Sharing evaluation results of quality improvement initiatives with staff, clients, and families
- Contacting clients, families, or referral organizations to evaluate the effectiveness of a transition and to improve transition and end-of-service planning

Organizations using the *Obstetrics Services Standards* also achieved high levels of compliance with the Required Organizational Practices (ROPs).² However, there are opportunities for improvement with regard to providing training on infusion pumps, implementing a falls prevention strategy, and conducting medication reconciliation at care transitions.

HIROC's malpractice claims show an increase in maternal/newborn claims. By claims costs, the top-rated risk was the failure to interpret or respond to abnormal fetal status, followed by mismanagement of induction and augmentation medications. Overall, Level III centres³ had the highest level of compliance with maternal/newborn mitigation strategies, compared to Level I centres⁴ and Level II centres.⁵ Level II centres showed the greatest overall improvement in compliance with risk mitigation strategies. Areas for continued improvement relate to

¹Does not include midwife-led care.

²Required Organizational Practices (ROPs) are essential, evidence-informed practices that client organizations must have in place to mitigate risk and improve the quality and safety of their services.

³Level III centres are tertiary hospitals with full on-site perinatal and neonatal services.

⁴Level I centres are community or rural hospitals providing maternity care for women with no major risk factors normally without specialist support.

⁵Level II centres are community or regional hospitals providing care for low and high risk pregnancies with specialist support.

monitoring adherence to fetal surveillance protocols and chain of command protocols, and implementing on-call or second on-call contingency plans.

CMPA's analysis of 688 medical-legal cases closed in the last 10 years show five high-risk clinical areas:

- Fetal heart rate monitoring
- Induction and augmentation of labour
- Assisted vaginal delivery
- Timing of the decision to perform a caesarean section (C-section)
- Managing shoulder dystocia

Additional areas for improvement are clinical decision-making, team communication, policies or procedures, informed consent, and recordkeeping.

Salus Global Corporation's MORE^{OB} (Managing Obstetrical Risk Efficiently) Program is an obstetrics risk prevention and error reduction program used in over 300 hospitals and birthing units across Canada. Results associated with the MORE^{OB} Program include improved outcomes for infants and mothers, reduced numbers of malpractice claims, and lower liability insurance costs. It also results in improvements in resource utilization, quality of worklife, application of evidence-based knowledge, and completeness of documentation.

The leading practices, case studies, and stories outlined in this report demonstrate that changes in health care delivery, medical technology, demographics, and the workforce are among the factors that are having and will continue to have an impact on obstetrics services in Canada.

Introduction: Obstetrics services in Canada

Health care professionals strive to deliver high-quality health services, and those who provide obstetrics services are committed to safe care for women and newborns. Recognizing the importance of quality and safety in obstetrics, Accreditation Canada, HIROC, CMPA, and Salus Global Corporation collaborated to highlight the strengths and opportunities for improvement in obstetrics services⁶ across the country. These four organizations are committed to health care safety and to improving the performance of health care teams. This report:

- Showcases the performance of Canadian health care organizations and practitioners providing obstetrical services with respect to safety and quality standards
- Identifies areas of strength and opportunities for improvement in obstetrical services, including postpartum care⁷
- Highlights key risks in obstetrics
- Outlines key risk mitigation strategies and their adoption by health care organizations
- Showcases resources, innovations, and leading practices available to health care teams and organizations delivering obstetrics services

CASE STUDY

Creating a community of practice

The team at Inuvik Regional Hospital created a community of practice to address a lack of consistent, complete, and safe prenatal care in the region. Interventions focused on developing a formal communications strategy that included all obstetrical care providers. Weekly multidisciplinary prenatal rounds, a prenatal round table to discuss risks and follow up for every woman who is at 36 weeks, and ongoing performance audits created a culture of safety that is providing safer and more comprehensive obstetrical care for women and babies. Read the detailed case study in [Appendix E](#).

The quality and safety of obstetrics services provided to Canadian families deserve ongoing attention, given that around 380,000 births occur annually in Canada (Statistics Canada, 2015) and that childbirth is the main reason for hospital stays (Canadian Institute for Health Information, 2014). The results presented in this report indicate that while the quality of obstetrics care in Canada is high, patient safety incidents continue to occur.

As much as there are clear opportunities to learn from what goes wrong, it is equally vital to understand why things go right, so as to recreate them. This concept is known in resilience engineering as production safety. A focus on a culture of safety and an emphasis on teamwork, effective communication, and standardized and reliable care processes are crucial to improvement. Measuring quality plays a significant role in the effectiveness, efficiency, and safety of services. Risks and areas for improvement need focused attention from health care leaders and interprofessional teams across the country to achieve sustained, positive change.

⁶Does not include midwife-led care.

⁷Care that follows childbirth.

National results from Accreditation Canada: Measuring performance in obstetrics services

The [Accreditation Canada](#) Qmentum accreditation program helps health care organizations improve the quality of their services by providing comprehensive, sector-specific standards, a customized on-site survey plan, a thorough self-assessment and on-site survey process, and detailed accreditation results identifying strengths and opportunities for improvement. For more information about Qmentum, see [Appendix A](#).

The *Obstetrical Services Standards* apply to the labour and birth process in the acute care setting, up to the point when the mother and baby go home or are transferred to another care setting. Compliance rates with the standards provide information on how organizations are performing with respect to quality, safety, and best practices.

In 2011, the *Obstetrics Services Standards* were enhanced by Accreditation Canada, with the help of a national Standards Working Group consisting of obstetrics experts and stakeholder organizations from across the country, and additional input from a broad web-based consultation. The language was updated and new content was added with regard to:

- The use of structured communication tools and documentation of fetal health assessments
- Determining levels of monitoring and expertise required during labour and at birth
- Having standardized procedures for fetal health surveillance, responding to abnormal fetal heart rate tracings, and mobilizing resources for urgent birth cases
- Having a policy and procedure for sponge and needle counts for pre- and post-vaginal births
- Having an infant feeding policy
- Safely using obstetrics devices and equipment
- Safely administering oxytocin and prostaglandin
- Using a safe surgery checklist before beginning surgical procedures

The enhanced standards were first evaluated during on-site surveys starting in September 2012.

Compliance with the Accreditation Canada *Obstetrics Services Standards*

Compliance with the *Obstetrics Services Standards* was assessed in 185 health care organizations—91 acute care organizations, 93 health systems, and one aboriginal health services organization—from 2012 to 2015. Across Canada, client organizations achieved high compliance with the standards overall, and excelled in three areas, as shown in Table 1, where they achieved full compliance.

Table 1 – Obstetrics Services Standards: Strengths, 2012–2015

Standard	Description
The team accurately and appropriately assesses each client in a timely manner.	Timeframes for completing the initial assessment, including physical and psychological health, are set and tracked; risks and level of monitoring and care required during labour and birth are identified.
The team safely and effectively uses obstetrics and postpartum devices and equipment.	Best practice guidelines and manufacturers' instructions are followed; training on the use of new devices and equipment is provided.
The team keeps client information accurate, accessible, up to date, and secure.	Client records are maintained; applicable legislation for protecting the privacy and confidentiality of client information is met; clients have opportunities to access their records; and staff and service providers have timely access to client information.

Approximately 10% of client organizations did not meet certain standards, as shown in Table 2.

Table 2 – Obstetrics Services Standards: Opportunities for improvement, 2012–2015

Standard	Description	What needs to be improved?
The team prepares the client for vaginal or C-section birth.	Standardized procedures are followed and plans/procedures are ready for any emergency.	Having a policy and procedure for sponge and needle counts for pre- and post-vaginal births.
The team prepares clients and families for transition to another service team or setting, service provider, or end of service.	Clients and families are informed about and prepared for the transition process.	Contacting clients, families, or referral organizations to evaluate the effectiveness of a transition. Using information to improve transition and end-of-service planning after the transition or end of service. Developing a formal evaluation process for obstetrics services (e.g., using follow-up phone calls).
The team makes ongoing improvements to its obstetrics services.*	Performance measures for obstetrics services are identified and monitored, and evaluation results are shared with staff, clients, and families.	Monitoring clients' and families' perspectives on the quality of obstetrics services, and comparing results with other similar organizations. Sharing evaluation results of quality improvement initiatives with staff, clients, and families.

Standard	Description	What needs to be improved?
The team collects and uses indicator data to guide its quality improvement initiatives.	Indicator data to guide quality improvement initiatives at the team level are collected and used.	Identifying indicators to monitor progress toward quality improvement objectives.

* n effect from 2012 to 2014.

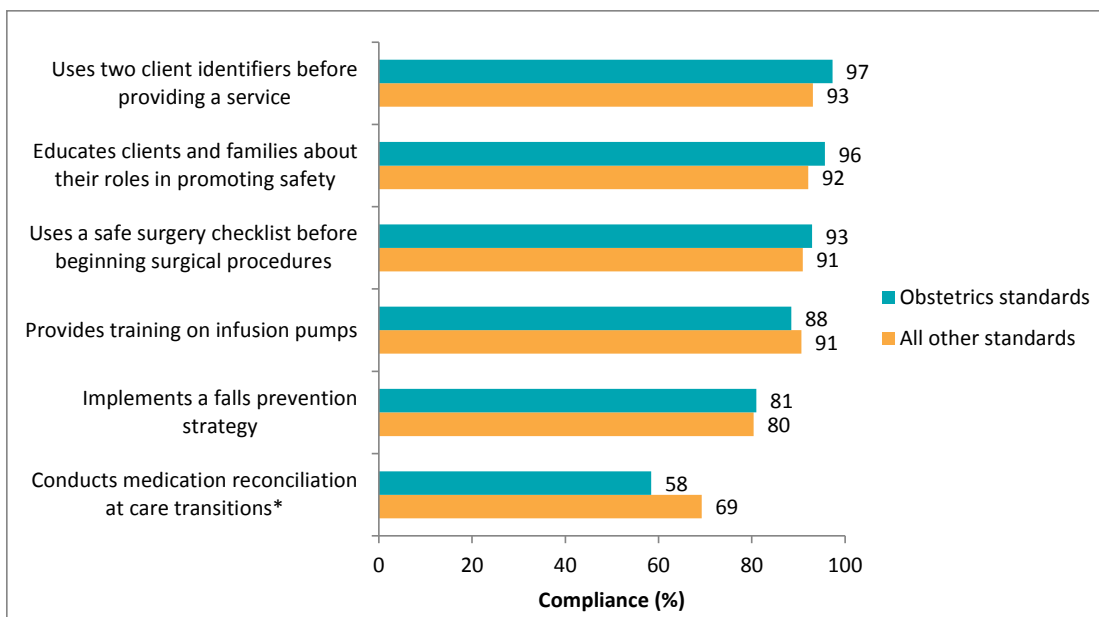
** New in 2015; replaces “The team makes ongoing improvements to its obstetrics services.”

Required Organizational Practices in the *Obstetrics Services Standards*

Required Organizational Practices (ROPs) are key components of Qmentum. Introduced in 2005, ROPs are essential, evidence-informed practices that client organizations must have in place to mitigate risk and improve the quality and safety of their services. ROPs are developed with input from health care experts from across the country at provincial, territorial, and national levels, including health service practitioners and providers, researchers, policy makers, ministry personnel, and academics.

Each ROP has a goal statement, a guideline with the rationale and supporting evidence, and tests for compliance that are rated as met or unmet during the on-site survey. An organization must meet all tests for compliance to meet the ROP. Figure 1 compares ROP compliance from 2012 to 2015 for the ROPs found in the *Obstetrics Services Standards* with all other standards.

Figure 1 – ROP compliance, 2012–2015



*The medication reconciliation at admission ROP and the medication reconciliation at transfer or discharge ROP were replaced by the medication reconciliation at care transitions ROP for on-site surveys beginning in 2014. The compliance rates for medication reconciliation at care transitions in this figure are based on 2014 and 2015 data only.

As shown in Figure 1, organizations using the *Obstetrics Services Standards* achieved higher compliance with most ROPs than did other clinical teams using all other standards. However, there are three key opportunities for improvement, as follows:

1. Conducts medication reconciliation at care transitions (58%)

Organizations using the *Obstetrics Services Standards* achieved 58% compliance with this ROP from 2014 to 2015⁸, while organizations using all other standards achieved 69% compliance. The low compliance with this ROP in obstetrics services can be explained by organizations not yet initiating medication reconciliation in obstetrics services during the on-site assessment period. Accreditation Canada is moving towards full implementation of medication reconciliation across all services and programs.

2. Implements a falls prevention strategy (81%)

Organizations using the *Obstetrics Services Standards* achieved 81% compliance with implementing a falls prevention strategy, while organizations using other standards achieved 80%. While some believe obstetric populations are at low risk for falling, blood loss and medications can cause obstetrical populations to be unexpectedly unsteady on their feet.

3. Provides training on infusion pumps (88%)

Organizations using the *Obstetrics Services Standards* achieved 88% compliance with this ROP compared to all other organizations that had 91% compliance. For surveys beginning in January 2016, this ROP was revised to expect organizations to go beyond training and adopt a comprehensive approach to infusion pump safety. It was strengthened with six tests for compliance as opposed to one in the previous version.

Recognizing Leading Practices

Accreditation Canada recognizes Leading Practices in organizations across the care continuum. These practices are worthy of recognition as commendable examples of high-quality leadership and service delivery. Many are ingenious in their simplicity and show how innovative strategies can be applied and excellence achieved, often at minimal cost. To qualify as leading, the practice must be:

- Linked to Accreditation Canada standards
- Sustainable
- Creative and innovative
- Client- or family-centred
- Regularly evaluated
- Able to demonstrate successful results and efficiency in practice
- Adaptable by other organizations

Leading Practices are posted on the [Leading Practices database](#). Table 3 shows some of the obstetrical Leading Practices accepted between 2012 and 2015.

⁸Compliance with previous versions of this ROP was similar from 2012 to 2013: 66% for medication reconciliation at admission and 46% for medication reconciliation at transfer or discharge.

Table 3 – Leading Practices in obstetrics services

Organization	Leading Practice
Sunnybrook Health Sciences Centre, Ontario	Leadership in critical care obstetrics education
The Scarborough Hospital, Ontario	Early Pregnancy Assessment Clinic (EPAC)
Markham Stouffville Hospital, Ontario	Birth options following C-section sessions
London Health Sciences Centre	The development of an Obstetrical Triage Acuity Scale (OTAS)

LEADING PRACTICE

Leadership in critical care obstetrics education at Sunnybrook Health Sciences Centre, 2013

Sunnybrook Health Sciences Centre has established an innovative model of care to support critically ill pregnant women with co-morbidities. This program fills a gap in traditional obstetrical care for pregnant women with complex medical needs. Expert obstetrical nurses are trained in advanced critical care competencies, allowing them to care for complex cases in addition to monitoring the fetus and providing care throughout labour, delivery, and postpartum. This innovative model allows pregnant women who have both obstetrical and critical care needs to be cared for in one program.

Everyone who took the critical care course reported that it changed their nursing practice, as well as increased their confidence, improved their critical thinking, and lessened their anxiety when caring for critically ill patients.

This education initiative has been presented corporately and nationally. Support for staff learners includes flexible work schedules and mentorship. Sunnybrook demonstrated innovation in nursing education by developing opportunities for learning, growth, and self-sufficiency while also creating a safe and innovative model of family-centred care. The program minimizes multiple transfers to different units, thus decreasing the potential for knowledge translation errors and enhancing patient safety. And families benefit from the continuous care and being able to maintain an established nurse-patient therapeutic relationship.

The development of an Obstetrical Triage Acuity Scale (OTAS) at the London Health Sciences Centre, 2015

Obstetrical triage at the London Health Sciences Centre is an outpatient area in the inpatient birthing unit that provides urgent and emergent ambulatory care for pregnant women over 20 weeks gestation. It is often very busy. Working in triage requires critical thinking and prioritizing care to manage patient volume and provide safe, client-centred care. In many ways it is similar to an emergency room with issues related to overcrowding, prolonged length of stay, and patient access.

The London Health Sciences Centre began work on triage practices based on an Accreditation Canada on-site survey in 2005 which identified that communication from the initial registration area of the unit and the time to initial assessment by the nurse both needed to be improved. The Obstetrical Triage Acuity Scale (OTAS) was the result. Based on the Canadian Triage Acuity Scale (CTAS) used in Canadian emergency rooms, OTAS is a five-category acuity scale, from resuscitative to non-urgent, with a comprehensive set of obstetrical determinants.

OTAS is the first obstetrical triage acuity scale with established reliability and validity. Results were published in the American Journal of Obstetrics and Gynecology in 2013. Initial contacts with CTAS authors have developed into an ongoing collaboration that will help sustain the OTAS as a tool that can be used in any level of institution.

Implementing OTAS as a standardized assessment of acuity for obstetrical triage can help obstetrical teams assess the distribution of acuity, measure patient flow stratified by acuity, and assess triage interventions to improve patient flow.

The HIROC experience: Obstetrical patient harm incidents in medical-legal claims

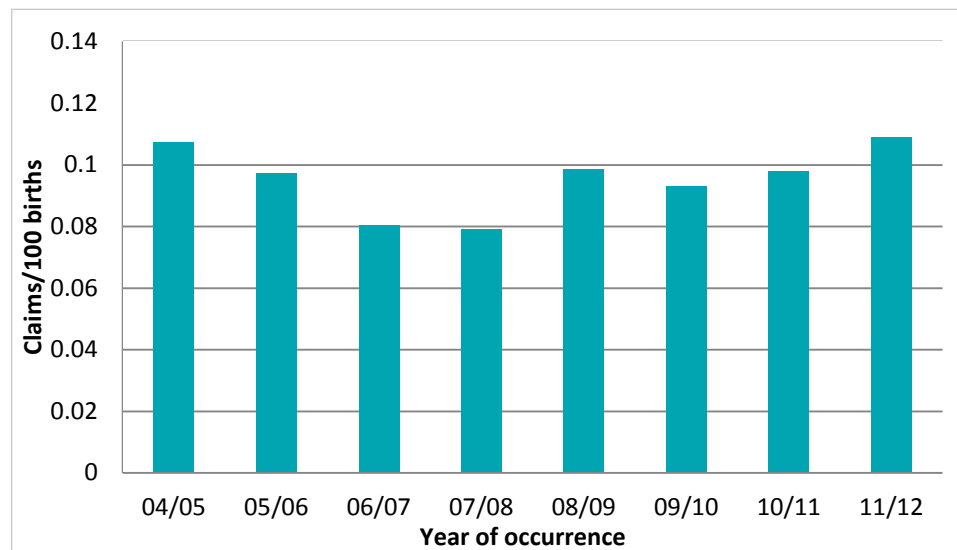
HIROC's medical-legal claims database is a rich source of patient safety knowledge. Maternal and newborn patient safety incidents are prominent in medical malpractice databases due to the severity of harm and the associated high costs. [Appendix B](#) describes the uses and limitations of medical malpractice data and the nuances associated with assessing harm in maternal and newborn cases.

The findings in this section are based on an analysis of maternal/newborn⁹ claims reported to HIROC and occurring between April 2004 and March 2012. Results from HIROC's knowledge translation strategy to scale and spread the learnings from maternal/newborn claims are also discussed.

Maternal/Newborn Claims (2004–2012)

Over 1,000 claims were reviewed over the eight-year period between April 1, 2004 and March 31, 2012 for hospitals insured by HIROC.¹⁰ Figures 2 and 3 depict trends in the number of claims and costs and show that the number of maternal/newborn claims reported to HIROC declined from 2004–05 to 2007–08 and then increased from 2008–09 onward. Costs were relatively flat with the exception of 2009–10 which was influenced by a few very costly maternal/newborn claim settlements.¹¹

Figure 2 – Number of claims per 100 births by year



⁹Includes labour, delivery, and immediate postpartum care.

¹⁰Includes hospitals in Newfoundland and Labrador, Ontario, Manitoba, Saskatchewan, and Yukon.

¹¹Due to the time it takes for maternal/newborn claims to come to full development, the analysis ends at 2011–2012. Subsequent years are considered immature from a claims cost perspective.

Figure 3 – Claims costs (\$) per birth by year

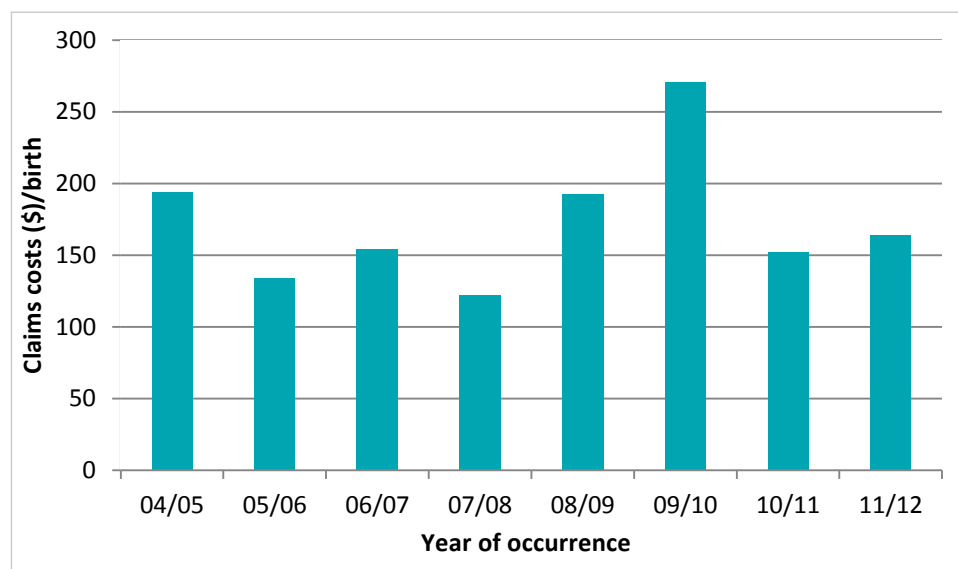


Table 4 shows the relative proportion of births, numbers of claims, and claims costs by maternal levels of care categories. Level I centres (community/rural hospitals, generally without specialist support) account for approximately 10% of births and claims. They are under-represented in claims costs, have the highest average number of claims per 100 births, and have the lowest average claims costs per birth. Level II centres (community/regional hospitals with specialist support) account for over 60% of births and numbers of claims. They are over-represented in total claims costs and have the highest average claims costs per birth. Level III centres (tertiary hospitals with full on-site perinatal and neonatal services) account for 25 to 30% of births and numbers of claims. They are under-represented in claims costs and have the lowest average number of claims per 100 births.

Table 4 – Births, number of claims, and claims costs by maternity level of care

Factor	Level I	Level II	Level III
Birth numbers (% of total)	8%	63%	29%
Maternal/newborn number of claims (% of total)	10%	65%	25%
Maternal/newborn claims costs (% of total)	4%	74%	22%
Average number of claims/100 births	0.13	0.10	0.08
Average claims costs (\$)/birth	\$93	\$205	\$132

Key Risks in Maternal/Newborn Claims

Certain risks are prevalent in maternal/newborn claims. Table 5 outlines the top 10 risks and their relative proportion of total maternal/newborn claims costs.

Table 5 – Top risks as a proportion of maternal/newborn claims costs

Maternal/Newborn Claims Risks (all hospitals)	Rank	% Costs
Failure to interpret/respond to abnormal fetal status	1	42%
Mismanagement of induction/augmentation medications	2	12%
Failure to monitor fetal status	3	10%
Failure to identify/manage hyperbilirubinemia	4	7%
Failure to communicate fetal status	5	6%
Delayed delivery (induction/C-section)	6	3%
Failure to identify/manage infection	7	3%
Shoulder dystocia	8	2%
Assisted vaginal delivery	9	2%
Improper performance of vaginal delivery (non-VBAC)*	10	2%

*VBAC refers to vaginal birth after C-section.

The top five maternal/newborn risks are also among the top 30 of all risks for acute care organizations.

1. **Failure to interpret/respond to abnormal fetal status:** Monitoring fetal status occurs but there are issues with not interpreting and/or responding to abnormal findings as appropriate.
2. **Mismanagement of induction/augmentation medications:** Inappropriate acceptance of an order for induction/augmentation medications and/or inappropriate management of induction/augmentation medications.
3. **Failure to monitor fetal status:** Not monitoring fetal status as appropriate and/or failing to document that fetal monitoring was performed.
4. **Failure to identify/manage hyperbilirubinemia:** Not identifying or screening neonates for jaundice and/or not communicating bilirubin levels to the most responsible practitioner.
5. **Failure to communicate fetal status:** Monitoring and interpreting fetal status occurs but there are delays or failures in communicating findings in a timely and/or effective manner to the most responsible practitioner. Also involves cases where the on-call practitioner could not be reached to attend a consult, birth, or an obstetrical emergency.

Learning from Failures: HIROC's Knowledge Translation Strategy

HIROC translates patient safety knowledge from claims to make it useful for the health care system and health care practitioners. This includes developing a list of the top risks leading to the most costly claims in acute care organizations; creating concise risk reference sheets for each risk highlighting claims findings, themes, cases, and key mitigation strategies; and an online program for organizations to systematically self-assess compliance with the key evidence-based mitigation strategies for each risk.

HIROC’s online Risk Assessment Checklist (RAC)¹² Program allows organizations and practitioners to assess their compliance with the 10 most effective mitigation strategies to address each risk and track and benchmark results over time. Table 6 summarizes overall compliance with the five maternal/newborn risks included in the RAC and the average improvement for the 30 organizations that have completed the three-year cycle to date.

Table 6 – RAC results for maternal/newborn risks

Maternal/Newborn Risks	% Compliance (year 1)	% Increase (by year 3)
Failure to interpret/respond to abnormal fetal status	87%	10%
Mismanagement of induction/augmentation medications	85%	12%
Failure to monitor fetal status	89%	7%
Failure to identify/manage hyperbilirubinemia	89%	9%
Failure to communicate fetal status	76%	18%

Following are key mitigation strategies for the highest ranked and lowest scoring of these risks.

Failure to interpret/respond to abnormal fetal status is the risk associated with the highest claims costs. The mitigation strategies that showed the biggest improvements were:

- Monitoring adherence to fetal surveillance protocols (66% compliance in year 1; 18% improvement by year 3)
- Having a decision tree/algorithm for atypical or abnormal fetal heart rate (80%; 18% improvement)
- Ensuring initial and ongoing competency of nursing staff in fetal surveillance (84%; 16% improvement)
- Adopting a standardized decision tool for emergency delivery preparations (80%; 11% improvement)

Failure to communicate fetal status is the maternal/newborn risk with the lowest compliance scores. The mitigation strategies with the biggest improvements were:

- Monitoring adherence to chain of command/escalation protocol (52% compliance in year 1; 32% improvement by year 3)
- Reviewing the on-call/second on-call contingency plan each time it is activated (61%; 19% improvement)
- Implementing an obstetrical chain of command/escalation protocol (84%; 16% improvement)
- Implementing an on-call and second on-call contingency plan (68%; 16% improvement)

A case study illustrating the complexity and risks associated with obstetrics care, particularly fetal surveillance monitoring, on-call contingency plans, and chain of command protocols can be found in [Appendix B](#).

¹²The RAC, introduced in 2011, generates an overall compliance score for each risk based on an organization’s response to each mitigation strategy within the risk. The assessment cycle is every year for three years.

Learnings from the CMPA: High-risk patient safety issues in obstetrics

The Canadian Medical Protective Association (CMPA) provides information to support improvements in the safety and quality of obstetrics services in Canada and makes practical suggestions to enhance clinical care. A legal action naming a CMPA physician member arises in approximately one in every 7,700 births in Canada. Between 2010 and 2014, 688 obstetric medical-legal cases¹³ were closed at the CMPA.

Table 7 – Percentage of patient outcomes for mothers and babies, CMPA obstetrical cases closed (2010–2014)

Patient disability/outcome	Mother (%)* (n 688)	Baby (%)* (n 395)
Death	4%	33%
Catastrophic**	0	27%
Major***	6%	15%
Less severe	37%	19%
No harm	52%	7%

*Totals do not equal 100% due to rounding.

**Catastrophic disability refers to impairments of the nervous system, including brain, spinal cord, peripheral nerves, mental status, and integrative functioning.

***Major disability is defined as major motor or sensory abnormalities rendering the person into a dependent state, and includes permanent and temporary injuries. Examples are severe hemorrhage, third or fourth degree tears for mothers, and mild diplegic cerebral palsy for babies.

Of the 688 cases, 395 pertained to the care of the baby. A review of patient outcomes in these cases reveals that the babies experienced greater harm than the mothers.

An extended analysis of the CMPA medical-legal cases closed over the last 10 years revealed the following five high-risk clinical areas. These were also identified by HIROC as being among the top claims risks.

- Fetal heart rate monitoring
- Induction and augmentation of labour
- Assisted vaginal delivery
- Timing of the decision to perform a C-section
- Management of shoulder dystocia

Themes and Recommendations

Based on the CMPA's analysis, the following themes, cutting across multiple care areas and disciplines, were identified. For each theme, recommendations are based on expert opinions and CMPA analysis.

¹³Includes civil legal actions and complaints to regulatory authorities (colleges) and hospitals.

Deficiencies in clinical decision making

A large proportion of CMPA cases involved delay in recognizing an atypical or abnormal fetal heart rate pattern by nurses and physicians. These delays were often attributed to poor situational awareness (i.e., keeping track of what is happening and anticipating what might need to be done) or inadequate interpretation of the fetal heart rate tracing. Examples of delay include infrequent assessments or persistent use of oxytocin in the presence of an atypical/abnormal fetal heart rate pattern that warranted expedited delivery. Deficiencies in clinical judgment were frequent contributors to ineffective team communication (see case study below).

Recommendations for improvement

- Recognize gaps in skills or training within the obstetrical team and provide appropriate professional development.
- Invite input from all health care professionals to maintain situational awareness.
- Be mindful of changes in patient condition when using high-alert medications such as oxytocin or magnesium sulfate.
- Reinforce the need for regular training in fetal assessment and situational awareness for all obstetrics clinicians.

CASE STUDY

Deficient clinical judgment, lack of informed consent, non-adherence with protocols

A woman is admitted for induction of a twin pregnancy in her 37th week. Her labour progresses uneventfully following artificial rupture of the membranes and oxytocin infusion. Twin A delivers vaginally within six hours with no clinical issues. Artificial rupture of membranes of Twin B's sac is performed and oxytocin augmentation is resumed over the next hour. Application of a fetal scalp electrode shows decelerations with loss of variability. The obstetrician makes the decision to apply a vacuum but encounters multiple pop-offs. The obstetrician then makes three unsuccessful attempts at delivery with forceps. C-section is undertaken approximately 90 minutes after delivery of Twin A. Twin B is diagnosed with hypoxic ischemic-encephalopathy and dies two days later.

Experts find that Twin B's fetal heart rate warranted immediate delivery within 10 to 15 minutes after delivery of Twin A and that the resumption of oxytocin was contraindicated. The obstetrician acknowledges the need for improved consent discussion for instrumental deliveries and the importance of discussing the events at delivery with the patient and family.

For more case studies highlighting key issues and the complexity of CMPA obstetric cases, see [Appendix C](#).

Ineffective team communication

Team communication issues have been reported in 70% of obstetrical sentinel events (Joint Commission, 2004). Communication problems were contributing factors in a number of CMPA cases. Common communication issues include nurses not providing sufficiently detailed information on maternal and fetal status, physicians not seeking out or questioning the clinical information provided to obtain a more complete clinical picture, and clinical staff not providing sufficient detail at shift change or handover. Other failures include not communicating the

urgency of requests for consultation or delivery which contributed to delayed response and patient harm.

Research identifies the reluctance of team members to escalate concerns due to uncertainty or intimidation, including disruptive physician behaviour (American College of Obstetricians and Gynecologists, 2011), as a factor leading to poor interprofessional communication. This problem is often associated with hierarchy and workplace culture; consequently, fostering a culture of safety has been an important focus of many teamwork-related obstetrical patient safety initiatives (Simpson, Knox, Martin, George, & Watson, 2011; Milne, Walker, Vlahaki, 2013).

Recommendations for improvement

- Communicate sufficient information to promote situational awareness about patient condition and progress.
- Implement a standardized communication tool for patient consultations and handovers.
- Employ strategies to escalate clinical concerns within the team.
- Clearly communicate persistent fetal heart rate concerns and clinical concerns to emphasize timely attendance of appropriate staff or delivery.
- Provide simulation training and drills to practice shared awareness, communications, and crisis response within the team.
- Foster a culture of safety with open and respectful communication.

Failure to have or follow a procedure and other system issues

The CMPA data indicate that a lack of procedures as well as clinicians not adhering to procedures and clinical practice guidelines were implicated in cases involving problems in assisted vaginal delivery, induction or augmentation, and fetal monitoring. Examples include non-standardized protocols for dosing, monitoring, and acting on fetal and maternal responses to oxytocin or for surveillance of women with risk factors such as vaginal birth after C-section (VBAC).

Other system issues are lack of resources (e.g., equipment and people), lack of familiarity with equipment or procedures, lack of clarity around roles and responsibilities (e.g., most responsible physician), unclear on-call protocols, and inadequate supervision of junior staff.

Recommendations for improvement

- Clearly define the roles and accountabilities of each team member to optimize care coverage and team responsiveness.
- Have adequate policies and procedures to monitor maternal and fetal well-being. Embed decision support guidelines into the flow of care. Evaluations of policy and procedures adherence and improvements should be undertaken on a regular basis.
- Review and discuss clinical practice guidelines and related policies with the team, particularly for high-risk situations and medications to reduce unwarranted variation in the provision of care.
- Ensure all necessary equipment is available and functioning and that clinicians are familiar with it.
- Determine if a back-up plan is required prior to attempting a trial of instrumental vaginal delivery.
- Have clear policies for the interpretation and management of atypical or abnormal fetal heart rate tracings.
- Encourage regular review and updating of policies and related skills.

Inadequate informed consent

Expert opinion across many cases focused on the incomplete discussion of risks associated with specific interventions or routes of delivery. Catastrophic VBAC cases were often associated with inadequate consent discussions about maternal or fetal harm that may arise from uterine rupture during induction or augmentation.

Recommendations for improvement

- Discuss each patient's individual labour and delivery options in the antepartum period, and consider the possibility of unanticipated events requiring urgent or emergent interventions.
- Tailor the risk discussion to the patient's pre-existing conditions and take sufficient time to address the patient's questions.
- Inform patients about the role of other health care providers, including trainees, who may be potentially involved in their care.
- Ensure each consent discussion is clearly documented in the medical record.

Incomplete records

Gaps in documentation in the medical record made it challenging to understand and support the clinical care and decision making under review. Missing information included prenatal assessments (e.g., obstetric history, maternal comorbidities, or fetal measurements), delivery plans (e.g., interventions, elective C-section), and individualized risk discussions. Failure or delay in documenting details of labour and delivery (e.g., fetal position) was a major issue; particularly lacking were the maneuvers used to manage shoulder dystocia. The absence of documented patient discussions was also problematic.

Recommendations for improvement

- Ensure records and investigations are up to date and available to the obstetric team.
- Carefully document each discussion with the patient in the medical record.
- Consider using standardized templates (e.g., checklists) to facilitate documentation of important delivery information.
- Consider holding a team debrief after a challenging delivery.
- Strive for accurate and consistent documentation of the sequence and timing of events.

Salus Global Corporation's MORE^{OB} Program: Creating sustainable culture change

In 2001, the interprofessional Society of Obstetricians and Gynaecologists of Canada (SOGC) developed the MORE^{OB} (Managing Obstetrical Risk Efficiently) Program, a comprehensive patient safety approach focused on creating a sustainable change in culture (Ruiter & Cameron, 2016). In 2007, the SOGC and HIROC acted on their common interest in improving patient safety and formed Salus Global Corporation to research and develop safety approaches, and to deliver the MORE^{OB} program. In 2015, Salus Global became the first Jointly Accredited¹⁴ provider of interprofessional education in Canada.

MORE^{OB} reduces risk and error by integrating the lessons learned from managing risk and adverse events in industry and high reliability organizational structures into obstetrics and promotes a culture of patient safety. It is an innovative approach to the care of pregnant women that leverages interprofessional, up-to-date, and evidence-based education, the review of normal and abnormal events, skills practices, and simulations to emphasize teamwork, effective communication, and culture change. It brings together all health care professionals in the birthing unit through interprofessional, team-based education venues that leverage front-line ownership; this builds locally relevant and evidence-based practices that teams agree upon. MORE^{OB} provides the process and methods to eliminate a culture of blame in hospitals.

LEADING PRACTICE AND CASE STUDY

Targeted interventions to reduce C-section rates

Markham Stouffville Hospital set a goal of reducing C-section rates by 5 percent—and surpassed it using targeted interventions. The interventions included group learning sessions for pregnant women with a previous history of C-section; supportive care in labour practices; regular sharing of individual and provider group C-section, VBAC, and induction rates; and updating policies and procedures for non-medically indicated inductions. The team believes it is possible to replicate its results in other units by following the same strategy of stratifying the data, targeting the leading contributors to the C-section rate, and using best evidence to guide and sustain practice. Read the detailed case study in [Appendix E](#).

Since 2002, 317 hospitals across Canada have used a comprehensive, multidisciplinary approach to managing obstetrical risk through the MORE^{OB} Program. The program has also been used in the United States since 2005. Through MORE^{OB}, Salus Global partners with interprofessional obstetrical teams in their own practice environments to improve the way they work together.

At the start of the engagement, baseline assessments are performed. These assessments focus on culture, inter- and intra-professional knowledge gaps, key performance indicators, and patient satisfaction scores. By learning and working together in their own units, on issues that are specific to them, relevant change occurs which reinforces front-line ownership and engagement in the overall approach. Obstetrical teams develop the collective knowledge,

¹⁴This distinction is awarded by three global leaders in accreditation: Accreditation Council for Continuing Medical Education (ACCME), Accreditation Council for Pharmacy Education (ACPE), and American Nurses Credentialing Center (ANCC).

skills, attitudes, behaviours, and practices that build and sustain a culture of safety and continuous quality improvement. The assessments are repeated at selected intervals and have shown improvement. See salusglobal.com for further information.

Following is an overview of the MORE^{OB} Program's impact in helping interprofessional teams improve the quality and safety of obstetrics care.

Results

Applying knowledge and evidence-based patient safety tools and improving patient safety culture helps improve outcomes. The following data related to MORE^{OB} Program outcomes are drawn from the MORE^{OB} environmental scan, third-party peer-reviewed studies, and HIROC data.

Fewer interventions and improved maternal and neonatal outcomes

An approach focused on first reducing the probability of risk, followed by early diagnosis and rapid response when risk does occur, is associated with improved maternal outcomes. The improved outcomes include:

- Inappropriate post-date inductions reduced by 55% (n=189,983)
- Normal spontaneous vaginal delivery rate increased by 11% (n=247,767)
- Combined forceps and vacuum operative vaginal births reduced by 47%
- Prime C-section rate reduced by 12% (n=335,200)
- Decreasing trend in the probability of postpartum hemorrhage (Ruiter, Senikas, & Renouf, 2015)
- Third and fourth degree tears reduced by 22%
- Discharge ≥ 48hr reduced by 12% (Frick et al., 2009)

The reduced maternal interventions noted above were associated with improved outcomes for newborns:

- Infants with an Apgar score¹⁵ of ≤ 5 at five minutes reduced by 50%
- After low risk pregnancy and elective birth, the number of infants going to the NICU decreased by 77% (n=111,829)
- Infants on ventilators reduced by 31%
- Severe infant morbidity¹⁶ reduced by 24%
- Hypoxic ischemic encephalopathy reduced by 33%
- Infant mortality reduced by 18%

Reduced claims costs

HIROC studied the first 26 hospitals involved in the MORE^{OB} Program (chosen based on the maturity of the data) and found reduced claims costs when data from the five-year period preceding the MORE^{OB} intervention were compared to data from the five-year period following

¹⁵Apgar score is an index of observable signs on the newborn, generally accepted as an indication of infant wellbeing. The score is out of 10 with 10 being the best.

¹⁶Severe infant morbidity is an index of multiple conditions including respiratory distress; bacterial sepsis; omphalitis; cerebral, intraventricular, or subarachnoid hemorrhage due to birth injury; and intracranial non-traumatic hemorrhage.

the MORE^{OB} intervention. The MORE^{OB} approach led to the following outcomes over the last fifteen years:¹⁷

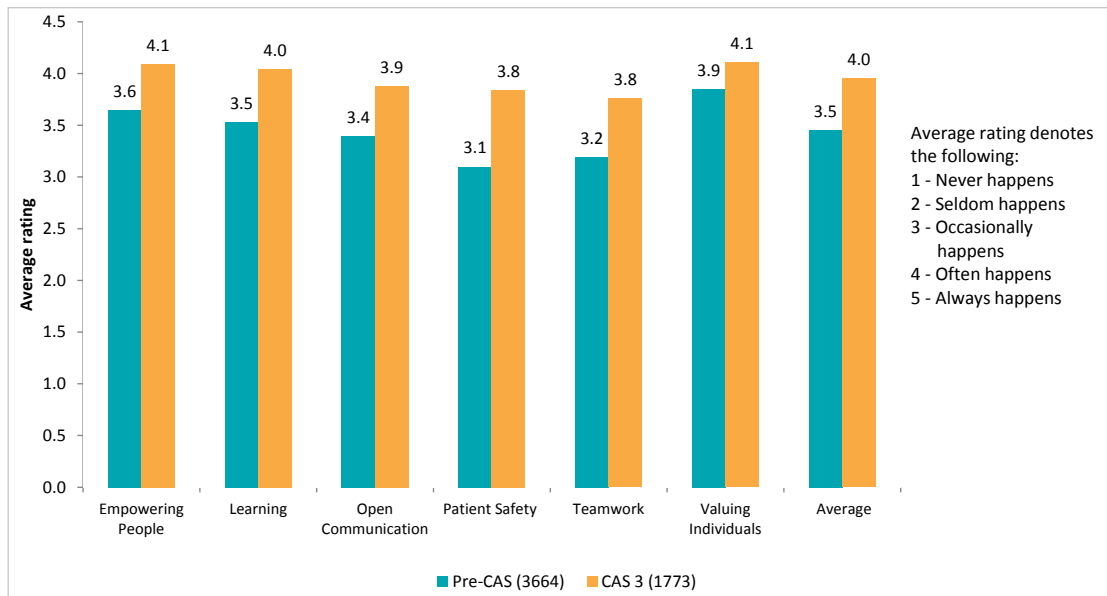
- Within the study group, the number of births rose by 8%, from 78,306 to 84,895 per year.
- Within the study group, the cost of significant¹⁸ HIROC claims decreased from \$137 million to \$89 million, while those in other units at the same hospitals rose.
- The trended claims cost per birth within the study group decreased by 40%, from \$350 to \$210 per birth.

Unit-based Culture Assessment Survey

Since many of the observed risk elements within this report can be linked to existing culture, a focus on culture is appropriate. The validated, unit-focused MORE^{OB} Culture Assessment Survey (CAS) is one of the assessments used in the program. The CAS evaluates the elements necessary to support a high reliability organization (Milne et al., 2010). A survey is performed at the outset of the program, and at selected time intervals. Results of the CAS reveals that continued engagement in MORE^{OB} is associated with an improvement in all elements of culture necessary to successfully build and maintain a high reliability perinatal unit. A recent analysis of HIROC data revealed that an interruption of engagement in the MORE^{OB} Program leads to an increase in the cost of litigation per birth (Graves & Montgomery, 2016).

Figure 4 illustrates the culture improvement, from baseline to the end of three years, in a recent cohort of 65 hospitals. The difference in the *n* is, in part, due to individuals not having yet completed the full three-year engagement.

Figure 4 – Improvement in culture rating from baseline CAS to the end of three years



See [Appendix D](#) for more information on the importance of culture in health care organizations.

¹⁷Based on a review of malpractice history before and after the introduction of the MORE^{OB} Program.

¹⁸Significant claims are defined as those above \$500,000.

CASE STUDIES

How MORE^{OB} is being used

Markham Stouffville Hospital Corporation, Ontario

Decreased C-section rates are attributed to involvement in MORE^{OB}. Interventions to reduce C-section rates were based on data collection and analysis. This is also an Accreditation Canada Leading Practice. More detail can be found in [Appendix E](#).

Kehewin Health Centre, Alberta

A shared care model is introduced for improved prenatal care for First Nation women, including more involvement by First Nation women. Results include decreased C-section rates and increased postpartum visits.

Grey Nuns, Alberta

Simulation workshops led to improved communication and collaboration among staff, physicians, and anesthesiologists.

Beaufort-Delta Health and Social Services Authority, Northwest Territories

A formal communication strategy improved the quality of care for prenatal patients. More detail can be found in [Appendix E](#).

Windsor Regional Hospital, Ontario

Three practice changes resulted in improved interprofessional relationships and communication.

Key learnings and looking forward

While the quality of obstetrics care in Canada is high, patient safety incidents continue to occur. Although infants often experience the greatest harm, consequences can be severe for infants, mothers, and their families. There is a high degree of alignment around the major risks and priority areas for improvement in obstetrical care:

- Fetal heart rate monitoring, interpretation, and response
- Induction and augmentation (i.e., intravenous oxytocin) of labour
- Timing of the decision and resources to perform a C-section
- Management of shoulder dystocia
- Assisted vaginal delivery (i.e., forceps and vacuum-assisted deliveries)

Ineffective team communication including not escalating care concerns, failure to use standardized obstetrical guidelines and protocols, and poor clinical documentation were also identified as issues.

Collectively, a care team with common goals, processes, and knowledge can move obstetrical patient safety forward. Health care organization leaders and interdisciplinary teams must maintain a focus on achieving and sustaining improvements in obstetrical care to achieve:

- A culture of safety
- Effective teamwork and communication
- Reliable implementation of standardized care policies and processes
- Monitoring and measuring the effectiveness, safety, and patient centredness of services

Looking forward

Accreditation Canada's focus on identifying emerging safety and quality risks is an important part of its ongoing enhancement of the Qmentum accreditation program. Most recently, significant revisions were made to strengthen and broaden the client- and family-centred care content in all Accreditation Canada standards, for evaluation during on-site surveys as of January 2016. This change reflects and promotes the need for meaningful involvement by clients and families throughout the care process. The standards now specify the elements of client engagement and collaboration that promote best practice.

Also for evaluation during on-site surveys as of January 2016, the Accreditation Canada standards were updated to include measurement for improvement criteria outlining the steps to use indicators effectively. This new content helps organizations identify areas for quality improvement and select and use indicators to measure the impact of their activities. In support of these new standards, the MORE^{OB} Program is piloting an approach in 2016 that is designed to support these practices.

HIROC's knowledge translation strategy continues to evolve to provide health systems and obstetrical care teams and practices with focused and evidence-based tools and resources. Revised Risk Ranking and Risk Reference Sheets reflecting changes in medical-legal claims and evidence-based practices are now available at hiroc.com. Starting in 2016, over 80 health systems are participating in their second three-year RAC cycle.

The CMPA is developing a focused education program in obstetrics with the aim of further reducing avoidable harm for mothers and babies, in collaboration with stakeholders. Pilot testing for this program occurred in 2016 and national spread is anticipated. In addition to

providing birthing units with information about the key risks, the interprofessional curriculum highlights the importance of reliability in decision making, team communications, system issues, informed consent, documentation, and quality improvement processes.

Obstetrical care providers also benefit from Salus Global Corporation's solutions for building stronger health care teams. The advantages of increased patient centeredness, interprofessional collaboration including the reductions in adverse events, improved performance, and quality outcomes can be achieved by teams and organizations delivering obstetrical services.

As much as there are clear opportunities to learn from what goes wrong, it is equally vital to understand why things go right, so as to recreate them. This concept is known in resilience engineering as production safety – an approach that needs to be carefully balanced in each team with a more traditional approach. This balance is a central tenet of the MORE^{OB} Program.

In summary

While Canadian health systems, teams, and practitioners strive for better maternal and infant outcomes, significant opportunities for improvement exist. Action is required at the system and direct care levels to reduce avoidable fetal, infant, and maternal harm incidents. A collective focus on obstetrical patient safety, including the adoption of evidence-based and reliable care processes, is crucial.

This report demonstrates the benefit of joint reporting and knowledge sharing to identify successes and prioritize improvement areas in obstetrics. Remembering and recreating what works and acting on opportunities for improvement can reduce the high cost of errors and patient safety incidents and, most importantly, benefit babies, mothers, and their families.

References

- American College of Obstetricians and Gynecologists. (2011, October). Disruptive behavior. Committee Opinion Number 508. Retrieved from <http://www.acog.org/Resources-And-Publications/Committee-Opinions/Committee-on-Patient-Safety-and-Quality-Improvement/Disruptive-Behavior>
- Canadian Institute for Health Information. (2014). DAD/HMDB hospitalization rate, average length of stay for top 10 high-volume inpatient hospitalizations and surgeries, and hospital-based newborn rate, 2013-2014. Retrieved from <https://www.cihi.ca/en/types-of-care/hospital-care/dadhmdb-hospitalization-rate-average-length-of-stay-top-10-high-volume>
- Choudry, Ifte. (n.d.) Culture, some definitions. Texas A & M University. Retrieved from <https://www.tamu.edu/faculty/choudhury/culture.html>
- Frick, C., Nguyen, T., Jacobs, P., Sauve, R., Wanke, M., & Hense, A. (2009, June). Outcomes following province-wide implementation of the Managing Obstetrical Risk Efficiently (MORE^{OB}) Program in Alberta. Poster presented at the Society of Obstetricians and Gynaecologists of Canada Annual Clinical Meeting. Halifax, Nova Scotia.
- Gittell, J. H. (2009). High performance healthcare: Using the power of relationships to achieve quality, efficiency and resilience. New York: McGraw-Hill; 2009.
- Graves, E., & Montgomery, N., (2016). Average cost savings of the MORE^{OB} Program. Unpublished manuscript.
- Hollnagel, E. (2014). Safety-I and safety-II: The past and future of safety management. Farnham, UK: Ashgate.
- The Joint Commission. (2004, July). Sentinel event alert, Issue 30. Retrieved from http://www.jointcommission.org/assets/1/18/SEA_30.PDF
- Levtzion-Korach, O., Frankel, A., Alcalai, H., Keohane, C., Oray, J., Graydon-Baker, E., Bates, D. W., (2010). Integrating incident data from five reporting systems to assess patient safety: Making sense of the elephant. *The Joint Commission Journal on Quality and Patient Safety*, 36(9):402-10.
- Milne, J. K., Bendaly, N., Bendaly, L., Worsley, J., Fitzgerald, J., & Nisker, J. (2010). A measurement tool to assess culture change regarding patient safety in hospital obstetrical units. *Journal of Obstetrics and Gynaecology Canada*, 32(6):590–97.
- Milne, J. K., Walker, D. E., & Vlahaki, D. (2013). Reflections on the Canadian MORE^{OB} obstetrical risk management programme. *Best Practice & Research: Clinical Obstetrics & Gynaecology*, 27(4):563-9.
- Morath, J., & Turnbull, J. (2005). To do no harm: Ensuring patient safety in health care organizations. San Francisco: Jossey-Bass.
- Ruiter, J. & Cameron, C. (2016). Birth models that nurture cooperation between professionals: Pizza and other keys to disarmament. In Daviss, B., & Davis-Floyd, R. (Eds), *Birth models on the edge: Finding solutions to global controversies*. Berkeley and London: University of California Press. Manuscript submitted for publication.

Ruiter, J., Senikas, V., & Renouf, L. (2015). Trends in postpartum hemorrhage during implementation of an educational and culture change program. Unpublished manuscript.

Simpson, K.R., Knox, G.E., Martin, M., George, C., & Watson, S.R. (2011). Michigan Health & Hospital Association Keystone Obstetrics: A statewide collaborative for perinatal patient safety in Michigan. *Joint Commission Journal of Quality and Patient Safety*, 37(12):544-52.

Statistics Canada. (2015). Birth, estimates, by province and territory. Retrieved from <http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/demo04a-eng.htm>

Thomas, E., & Petersen, L. (2003). Measuring errors and adverse events in health care. *Journal of General Internal Medicine*, 18(1):61-7.

Vincent, C., Davy, C., Esmail, A., Neale, G., Elstein, M., Cozens, J. F., & Walshe, K. (2006). Learning from litigation. The role of claims analysis in patient safety. *Journal of Evaluation in Clinical Practice*, 12(6):665-74.

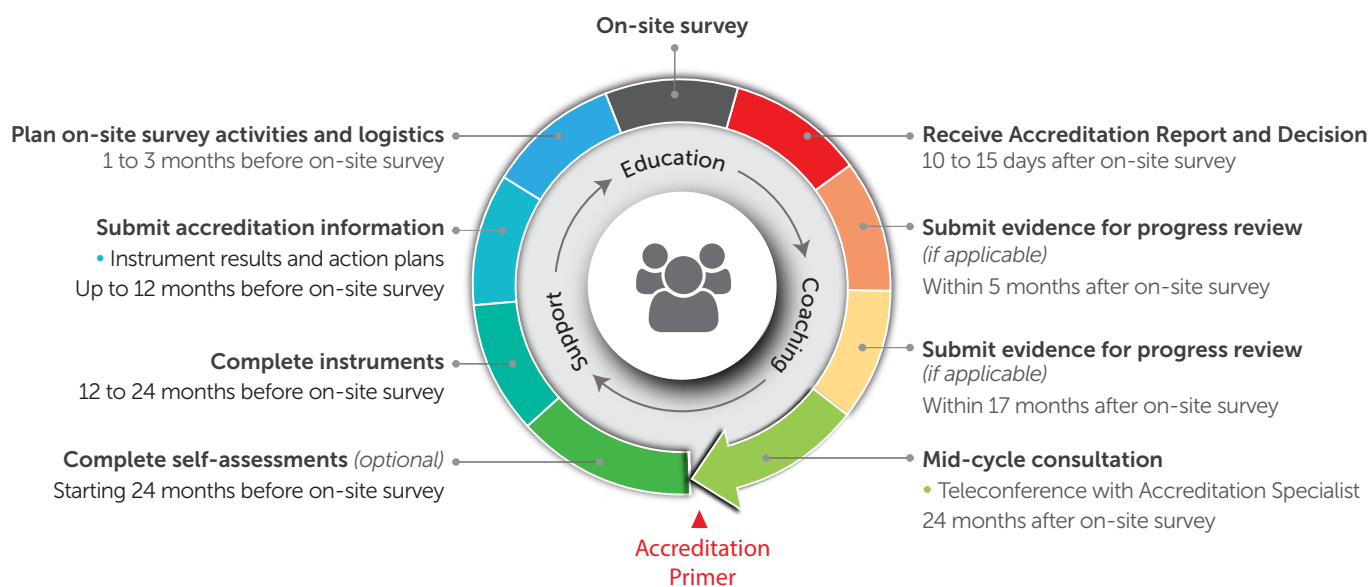
Vaughan, D. (1996). *The Challenger launch decision: Risky technology, culture, and deviance at NASA*. Chicago: University of Chicago Press.

Appendix A: The Accreditation Canada Qmentum program

Included in the Qmentum program are comprehensive standards, a customized survey plan, a thorough self-assessment and on-site survey process, and detailed accreditation reports identifying strengths and opportunities for improvement.

Accreditation Canada surveyors are peer colleagues from the health care system who are trained to assess the performance of health care organizations according to the Qmentum process. These experienced senior health care professionals—nurses, physicians, administrators, laboratory scientists, pharmacists, and social workers, among others—are from Canadian health care organizations accredited by Accreditation Canada. During the on-site survey, they observe and evaluate the extent to which the standards are being met, and draw from their understanding of the Qmentum program as well as their personal experience and knowledge to offer advice and guidance on areas for improvement.

Qmentum accreditation four year cycle



Appendix B: HIROC Medical malpractice data and maternal newborn claims

Uses of claims data: Medical-legal claims can be used to improve reliability by identifying important and actionable deficiencies in health care processes that are not generally captured by other data sources (Levtzion-Korach et al., 2010). Claims files provide information that can be used to qualitatively analyze adverse events, and are also particularly useful for identifying latent and systemic issues (Vincent et al., 2006; Thomas & Petersen, 2003). Analysis of aggregated claims data in anaesthesia, for example, led to the creation of professional standards requiring pulse oximetry and end-tidal carbon dioxide monitoring in the operating room, which dramatically decreased the risks associated with anaesthesia (Vincent et al., 2006).

Limitations of claims data: The limitations of using claims data are well established, particularly in the context of a single organization where claims are typically infrequent events. These limitations include low frequency and selection bias (they do not provide a representative picture of the entire population of adverse events); hindsight bias; and non-standardized data, which makes coding and analysis difficult outside of a pooled database (Vincent et al., 2006; Thomas, 2003).

Other challenges associated with using claims data include: claims may not be known or reported for many years after an incident occurred, meaning data from past years is subject to change (actuarial projections of currently unreported claims can be made in aggregate but are not included in this report); claims costs develop over time as new/expert information comes to light related to damages and causation; and judicial inflation (increasing awards for the most catastrophic types of claims).

Neonatal harm and claims costs: The most worrisome claims in labour and delivery involve neurological injury to neonates which usually involve hypoxic ischemic encephalopathy caused by lack of oxygen during the antenatal period which can lead to brain damage, and kernicterus (bilirubin-induced brain dysfunction) caused by a build-up of bilirubin in the postnatal period. Deficits may not be evident during infancy, but become apparent as cognitive and development milestones are missed later in life.

Medical malpractice claims costs comprise a number of factors including costs associated with investigating and managing a claim (i.e. adjusters, lawyers, and experts); and indemnity payments to the injured party/claimant for pain and suffering, out-of-pocket expenses and lost income, family losses, and cost of future care. The latter expense explains the high cost of maternal/newborn claims as neurological injuries in neonates may lead to permanent and debilitating injuries which result in the child requiring support with some or all of his or her activities of daily living and other medical care. In these circumstances, care may be required twenty-four hours per day and that care is funded by one or more of the defendants in a malpractice action if it is determined the party is liable.

Claims and claims investigations: The medical malpractice system represents society's approach to compensation of injured parties provided a number of legal considerations are met. Investigations of medical-legal claims are carried out by trained adjusters, legal counsel, and clinical experts. They investigate whether the care provided met a reasonable standard (i.e., what most other providers would do in a similar set of circumstances). Issues related to causality are also central to the review (i.e., whether the alleged breach in the standard of care

provided, caused, or materially contributed to the injury sustained). Investigations with clinical experts may determine that care did not meet an appropriate standard, resulted in damages to a patient, and that compensation is warranted. An investigation may also reveal that nothing could have been done to alter the course of events and that the health care provided did not cause or contribute to the injury sustained. Investigations of maternal/newborn claims can be particularly challenging as it is often difficult to determine when anoxia/brain injury occurred, whether it was preventable and by whom, and whether other factors such as maternal/placental factors or genetics played a role in the resulting outcome.

Case study: Complexities and risks in obstetrics care

A postdates pregnant woman went to the hospital twice with spotting and decreased fetal movement in the two weeks before her delivery. On her third visit, she was in the early phase of labour and fetal heart rate monitoring was started. Once she was transferred to the labour and delivery floor, the nurses recalled discussing the abnormal tracing with the on-call obstetrician and reported that the obstetrician left shortly after to attend another urgent obstetrical situation. The discussions with the obstetrician were never documented. When the obstetrician returned, the abnormal fetal heart rate pattern was confirmed and an emergency C-section was called. The infant was born with poor Apgar scores at one, five, and 10 minutes, and was diagnosed with severe brain damage and died five days after birth.

Expert review was critical of the nurses' reluctance to escalate their concerns to another physician if they did not receive a satisfactory response from the on-call obstetrician. The nurses also never documented their interactions with the obstetrician. While the experts felt the obstetrician was likely aware of the abnormal fetal heart rate pattern before attending the woman, the nurses were unable to recall what the obstetrician's responses or recommendations were.

Experts were also critical of the hospital's lack of a formal second on-call contingency plan in the event of two concurrent obstetrical emergencies. This system issue was felt to have delayed the C-section. Finally, experts were critical of the hospital's failure to have a formal escalation or "speaking up" chain of command protocol to facilitate and support any team member in escalating care concerns.

Appendix C: CMPA case studies

These examples highlight some of the key issues and complexities of CMPA obstetric cases.

Case study: Poor team communication and clinical judgment

A woman is admitted for induction at 37 weeks with oligohydramnios (a deficiency of amniotic fluid) and an abnormal non-stress test. Following two doses of dinoprostone, an oxytocin infusion is started. Electronic fetal monitoring is normal.

The physician artificially ruptures the membranes for clear fluid and applies a scalp clip. After five hours of active labour, an epidural is established. Within 30 minutes, the fetal heart rate tracing shows decreased variability and repetitive late decelerations. One hour later, the nurse notes increased uterine tone with poor relaxation between contractions; however, the nurse takes no action and continues to increase the oxytocin infusion.

Over the next two hours, the nurse notes three late decelerations, minimal variability, and fetal tachycardia. The nurse advises the physician, who remotely reviews a portion of the electronic fetal tracing, and orders that the induction continue. The nurse continues to increase the oxytocin infusion.

The physician attends one hour later and notes persistent minimal variability in the fetal heart rate tracing. The patient is found to be fully dilated and is instructed to start pushing. The monitor demonstrates progressive late decelerations; the physician is not notified of the worsening fetal status. The oxytocin infusion is increased. Two hours later, a limp infant is delivered spontaneously; aggressive resuscitation is required. The infant experiences early onset of convulsions, multi-system failure, and dies two days later. The autopsy shows extensive cerebral hypoxic-ischemic changes.

All experts consulted are critical of the poor communication regarding fetal status, the decision to not attend in person, and the failure to intervene in the presence of a worrisome tracing. Without expert support, a shared settlement is paid by the CMPA on behalf of the physician, and by the hospital on behalf of the nurse.

Case study: Inadequate risk discussion and no documentation regarding the management of shoulder dystocia

An obese 28-year-old woman with gestational diabetes is induced at 38 weeks for suspected fetal macrosomia. Her labour progresses quickly. Once she is fully dilated, the nurse pages the obstetrician who attends promptly. After the head is delivered, shoulder dystocia is encountered. The obstetrician instructs the nurses to place the patient in the McRoberts position and to apply gentle supra-pubic pressure. The obstetrician performs a midline episiotomy and a 4,945 gm (10 lb. 14 oz.) baby boy is delivered. The head-to-body interval was four minutes.

The physician is called away to assess another patient and does not document the events of the delivery. On examination, the baby's left arm appears flaccid, consistent with Erb's palsy. Following brachial plexus nerve grafting, the baby recovers some function of his arm.

A legal action ensues. Peer experts maintain that in light of the suspected macrosomia, the obstetrician should have discussed the risks of shoulder dystocia and management options available. The experts state the lack of documentation makes it difficult to support the care provided to resolve the shoulder dystocia. Without expert support, a settlement is paid by the CMPA on behalf of the obstetrician.

Appendix D: Culture

Culture is a way of life of a group of people—the behaviors, beliefs, values, and symbols that they accept, generally without thinking about them, and that are passed along by communication and imitation from one generation to the next.

Professor Ifte Choudhury, Texas A&M University

Issues with communication and teamwork are frequently cited as root causes of patient safety incidents. The causes of poor quality communication are steeped in poor quality professional relationships (Gittell, 2009). Poor work relationships and non-adherence to policies are related to organizational culture.

Groups of people who work together invariably have a culture. Cultures will assimilate newcomers. If a culture is positive, then newcomers will be assimilated into a good environment; if the culture is not positive, a more negative experience is expected. Within a culture are group experiences that can lead to dangerous situations. These are collectively known as normalization of deviance, such as those identified in the investigation of the Challenger disaster. Faulty or risky processes are not recognized or are minimized; serious deficiencies become entrenched in the work culture and are accepted as normal (Morath, 2005). As time goes on, technical and professional standards degrade. Eventually, all group cultures become less safe as they get away with normalizing deficiencies and the degradation of standards (Vaughan, 1996).

Therefore, interventions that are not focused on improving culture will likely not have sustained results. Interventions such as the MORE^{OB} Program incorporate within their design the improvement of culture, communication, and teamwork. MORE^{OB}'s team-based learning venues appear on the surface to be obstetric-focused educational activities—this focus drives engagement—yet are designed to leverage front-line ownership and improve culture, communication, and teamwork. As these improve, engagement builds and newcomers become assimilated into the positive culture. The communication and teamwork approaches they learned at school are now more likely to be accepted and applied, helping to sustain the change.

A focus on resilience and production safety (Hollnagel, 2014) further enhances culture, quality, and safety by leveraging the human as a resource rather than a liability. Reinforcing the team's ability to make changes leads to quick wins—further improving engagement and forming a quality and culture improvement cycle.

Appendix E: MORE^{OB} case studies

Joanne Engram
Beaufort-Delta Health and
Social Services Authority
Inuvik, Northwest Territories

Improving consistency and quality of care despite diverse culture, harsh landscape, and inconsistent staffing

The care team at Inuvik Regional Hospital created a community of practice to address a lack of consistent, complete, and safe prenatal care. Interventions focused on developing a formal communications strategy that included all obstetrical care providers. Weekly multidisciplinary prenatal rounds, a prenatal round table to discuss risks and follow up for every woman who is at 36 weeks, and ongoing performance audits created a culture of safety that is providing safer and more comprehensive obstetrical care for the women and babies in the region.

Background and overview

The Beaufort-Delta Health and Social Services Authority (BDHSSA) serves the 7,500 residents of the Beaufort-Delta region in the Northwest Territories. The Inuvik Regional Hospital offers acute care services in the fourteen in-patient bed unit, three special care unit beds, four day-surgery beds, and two birthing room beds. A complement of registered nurses and licensed practical nurses provide 24/7 care. The acute care department has access to diagnostic testing and laboratory services in the hospital. Seriously ill or injured patients needing intensive care beyond the scope of services available at Inuvik Regional Hospital are transferred to Yellowknife or Edmonton. There are approximately 150 births per year at the Inuvik Regional Hospital. Our primary care team has a patient- and client-focused approach to service delivery, striving to provide competent, evidence-driven, quality care. Our physician complement consists of nine full-time positions, of which only one is filled by a permanent physician. Therefore, the BDHSSA physician complement is staffed by 89 percent locum physicians.

Problem statement

Pregnant women in outlying and satellite communities come to Inuvik for confinement at 37 weeks. Historically, if a woman was low risk, only at the time of confinement was the Inuvik Regional Hospital obstetric (OBS) physician made aware of this patient. Due to the inconsistent physician population mentioned above, the MORE^{OB} Core Team noted that often patients would present in labour on the acute care unit without standard prenatal care. There was a lack of the MORE^{OB} Module One goals, especially the development of quick wins by having all disciplines on the same page. A few common occurrences included RH negative women who were not treated at 28 weeks, poorly completed obstetrical histories, and incorrect dating, all of which increased the risk to mother and newborn. As well, group B strep bacteria status was rarely confirmed, resulting in unnecessary use of antibiotics. There was no established reporting system or sign-over system among the locum physicians providing prenatal care. As

the MORE^{OB} Program maintains open communication, increased trust and respect among all members of the team resulted in improved maternal and neonatal outcomes and reductions in harmful events.

Goal

The MORE^{OB} Core Team wanted to develop a formal communication strategy among obstetrical care providers for the prenatal patients within the BDHSSA.

Plan

The MORE^{OB} Core Team met with its participant group and locum physicians in January 2011 to brainstorm solutions to address the lack of consistent, complete, and safe prenatal care. All parties agreed on a formal process of review of prenatal patients by those involved in their care. Working closely with the co-medical directors, it was decided that a weekly review would occur for prenatal patients at 36 weeks gestation and over, as well as for any patient deemed high risk.

Weekly multidisciplinary prenatal rounds were implemented in February 2011 and subsequently enhanced. The OBS physician scheduled time on Monday mornings for chart reviews and to request clinic appointment bookings for all patients on the standardized prenatal list. Patients are booked that week with the on-call OBS physician. Each Monday and Thursday, staff involved in prenatal care (including the team leader for acute care and emergency, manager of hospital nursing units, medical director, OBS locum physicians, visiting gynecology/obstetrics specialist, medical students and residents, nurse practitioners, prenatal nutritionist, manager of clinics and anaesthesia) take part in a prenatal round table. This involves a review of the patient's current status, including gestation confirmation and method, gravida and para review, group B status, RH status and treatment, blood type and antibody review, third trimester hemoglobin, third trimester chlamydia and gonorrhoea screen, body mass index (BMI), risk factors, date last seen in clinics, and any other relevant medical or psychosocial history. The obstetrics physician for that week discusses each patient's condition and relevant scheduled follow-up, and the multidisciplinary team actively plans for a safe delivery.

Formalized prenatal rounds

The MORE^{OB} Program asserts that when an interprofessional team works together, it creates a community of practice. Team members share a common interest and recognize that reflective learning results in shared knowledge. All team members must be empowered to speak up and identify what might be negatively affecting patient care and safety. With this initiative, the manager of nursing units discussed the MORE^{OB} Core Team's concerns regarding inconsistent prenatal care that often did not align with the MORE^{OB} standards as well as the lack of communication among prenatal care service providers with the medical directors. The manager of nursing units presented the MORE^{OB} Core Team's suggestion of formalized prenatal rounds to the senior management team, and this was supported by the senior leaders and the quality and risk manager.

After this approval, the MORE^{OB} Core Team met with its participant group and locum physicians to share the proposed solution. The participants play an essential role in this initiative. Once a week, one of the group members reviews all prenatal records in the family clinics and adds every woman at 36 weeks to the list with her relevant medical/obstetrical history and information. The OBS physician completes chart reviews and presents each

patient at the multidisciplinary obstetrical rounds on Mondays. The MORE^{OB} Core Team and participant members have been the change champions behind this initiative. They have often rallied to ensure it stayed on track in its infancy.

A performance audit can be helpful to review a program and determine whether it is achieving its objectives effectively and efficiently. Module 2 enhanced the BDHSSA staff and management's knowledge of the functional components of auditing. Through completed audits, we were able to identify that 25% of our RH negative women were not treated as per MORE^{OB} standards at 28 weeks gestation prior to the implementation of the prenatal reviews. We are now proud to report that 100% of our RH negative patients receive the standard of care. The audit reports and successes have been shared with our stakeholders, including Accreditation Canada, territory referral centres, quality and risk management, the public via the annual general report, senior management, and our dedicated obstetrical staff.

The bi-weekly multidisciplinary prenatal rounds are well established and the MORE^{OB} team has been successful in changing the culture to one that values communication and that has a common and informed voice for all team members. The multidisciplinary rounds have improved patient outcomes by identifying a growing population of women with a BMI greater than 45. This has led to the BDHSSA developing a guideline that requires an anaesthesia consult pre-delivery for any woman with a BMI greater than 45. In one case, this led to a transfer to the tertiary centre for delivery; in another, it ensured a patient with a cardiac condition (supra ventricular tachycardia treated with Verapamil) had proper supports such as additional trained personnel at delivery for both neonatal resuscitation and advanced cardiac life support. Finally, for patients choosing adoption, there now are support plans involving social programs to ease the transition. There are countless benefits for patient outcome improvements and staff education via this initiative.

Summary

In conclusion, our MORE^{OB} Core Team of seven members and participant team of ten members are often faced with the challenges of a diverse culture, harsh landscape, and inconsistent staffing patterns. Despite the obstacles, the team has consistently raised the bar in patient care, and has created a culture of safety that is apparent. I am proud to be part of such a group of change champions, leaders, and patient care advocates.

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Upsetting the apple cart: Changing the status quo hierarchy and high C-section rates

Markham Stouffville Hospital set a goal of reducing C-section rates by 5 percent—and surpassed it using targeted interventions. The interventions included group learning sessions for pregnant women with a previous history of C-section; supportive care in labour practices; regular sharing of individual and provider group C-section, VBAC, and induction rates; and updating policies and procedures for non-medically indicated inductions. The team believes it is possible to replicate its results in other units by following the same strategy of stratifying the data, targeting the leading contributors to the C-section rate, and using best evidence to guide and sustain practice.

Background and overview

Markham Stouffville Hospital (MSH) is a community-based, Level 2 hospital in York Region, one of the fastest growing regions in Ontario, Canada. It is experiencing a steady increase in the number of births each year. In 2014, the hospital welcomed close to 4,000 babies. MSH has a neonatal ICU allowing for management of gestation above 32 weeks. Since 2007, it has participated in the MORE^{OB} Program.

As we gained experience with the Program, the team focused not only on the clinical areas of risk identified in the program, but on addressing unit-specific needs and goals as a collaborative effort. At MSH, maternity care providers, obstetricians, family physicians, midwives, and nurses now function as a well-integrated multidisciplinary team and have learned to collaborate. Providers meet regularly and jointly develop clinical guidelines and policies reflecting various scopes of practice.

Goal

In 2010, after a rise in C-sections and induction rates and a decrease in VBAC, the MORE^{OB} Core Team created a Caesarean Reduction Strategies Task Force to examine the reasons for these trends and identify, implement, and evaluate a range of evidence-based interventions. The long-term goal was to reduce C-section rates by 5 percent. The task force brought together a multidisciplinary team of maternity care providers including midwives, nurses, obstetricians, anesthesiologists, pediatricians, and administrators.

Plan

The team stratified data by multiple variables and decided to focus on induction and VBAC. After a review of the literature on intervention strategies, the task force designed a specific plan to decrease these interventions and reduce the C-section rate. The interventions fell into three main categories: those aimed at pregnant women planning to deliver at MSH; those aimed at MSH providers; and those that would affect hospital policies.

Targeted interventions

Interventions targeting pregnant women included meetings with local prenatal educators to ensure consistency of information between educators and providers, and a revision of all patient education material to ensure that the descriptions of caesarean birth, VBAC, induction of labour, and supportive care in labour in those materials reflected best evidence. Based on the principles of informed choice and group learning, a session for all women with a history of previous C-section was established and led by the midwives. The Options for Birth Following Caesarean Birth sessions are an opportunity for women and their partners to discuss the reasons for their C-section and explore options for subsequent births. The session facilitator together with women who attend discuss the benefits and risks of both elective repeat C-section and VBAC and use a patient decision-making tool that assists women to fully explore their own specific risks and values. Session surveys demonstrate a high rate of satisfaction among participants.

Supportive care in labour practices is a focused intervention where staff have the education and tools to enhance one-to-one care for labouring women. Newly cross-trained perinatal nurses attend supportive care sessions with midwives, auscultation practices are encouraged in order to minimize the use of the electronic fetal monitor, and there is an area in the room for the nurse/midwife to sit comfortably. Necessary supplies, tools for documentation, and a Vocera communication device were also integrated into the room design.

Interventions aimed at practitioners began with rounds and data collection. The decision was made to communicate individual and provider group C-section birth rates, VBAC rates, and induction rates. At the start of this process, the chief of obstetrics provided each physician and midwife with a copy of their own personal rate along with their peer group's rate; these results were blinded. After two cycles of releasing quarterly rates, the results were unblinded at the request of all caregivers, and became known to all individuals in the peer group. These individual rates, overall unit rates, and the work done on reduction strategies are now part of each department and division meeting. Overall hospital rates for C-section, VBAC, and induction are posted by management on the unit in a place visible to the public. Stories describing our C-section reduction initiative, birth option sessions, and overall rates have appeared several times in the local newspapers. Our experience is now growing as the go-to place for other hospitals looking to reduce their C-section and induction rates. Staff members have remarked that Markham Stouffville has a strong reputation for lowering C-section rates.

All policies related to care of women in labour, VBAC, and induction of labour were reviewed and revised by our Patient Quality Committee, working closely with the task force members. One of the discoveries we made during our data review was the number of non-medically indicated inductions that were specifically listed as "post-dates." Our focus on the policy and process around this issue saw this rate fall to 1% in 2011–2012. Furthermore, our overall induction of labour rate decreased from 26% to 12% over the intervention period. The task force, together with management and professional practice, rolled out the policy changes as a package at varying times. It is difficult to know which had the most impact or whether the entire group of interventions working together achieved our results. It will likely be possible to replicate results in other units by using our strategy of stratifying the data, targeting the leading contributors to the C-section rate, and using best evidence to guide and sustain practice.

Summary

Our journey to reduce C-sections began in April 2010, when our rate was 29.6%. In 2010–2011, this fell to 26.3%, to 26% in 2011–2012, to 25.8% in 2012–2013, to 23.7% in 2013–2014. We surpassed our original goal of reducing the rate to 25%. While only 15% of women attempted VBAC in 2009–2010, this increased to 33.6% of women in 2013–2014, and approximately 80% of those had vaginal births.

We continue to work to improve care for women and hold each other accountable for high-quality, evidence-based practice. Our rates and indicators are tracked and reported monthly. Should the induction and C-section rates rise two months in a row, we strategize countermeasures that can be adopted to return to our goal.