Overview

1. What is the Robson cesarean section classification?

2. Results of Robson classification in 5 Canadian provinces and worldwide

3. Robson reporting in the BORN Information System
What is Robson?

• Robson is a standard classification systems of 10 mutually exclusive and totally inclusive classification categories for cesarean section (CS).

• ‘Need to adopt standard classification systems so that comparisons and improvement of care can take place.’

Robson, 2001
Dr Michael Robson
OBGYN, National Maternity Hospital, Dublin, Ireland

Clinical Obstetrics and Gynecology, 2001

‘Caesarean section rates should no longer be thought of as being too high or too low, but rather whether they are appropriate or not, after taking into consideration all the relevant information.’
Robson groups

1. Nulliparous, singleton, cephalic, term, spontaneous labour
2. Nulliparous, singleton, cephalic, term, induced labour or CS before labour
3. Multiparous, singleton, cephalic, term, without a previous CS, spontaneous labour
4. Multiparous, singleton, cephalic, term, without a previous uterine scar, induced labour or by CS before labour
5. Multiparous, singleton, cephalic, term, with a previous CS
6. Nulliparous, singleton, breech
7. Multiparous, singleton, breech
8. Multiple pregnancy (twins or higher-order multiples)
9. Singleton, transverse or oblique lie
10. Singleton, cephalic, pre-term

All remaining records that could not be classified due to missing information on one or more of the following variables: presentation, parity, gestational age, type of labour or previous cesarean.
Why are CS rates of concern?

- Cesarean section (CS) rates have been increasing worldwide over the last few decades.
- Most countries exceed the WHO recommended rate of 15% for all deliveries, keeping in mind the obstetric populations specific to Canada and Ontario.
- In 2010, the CS rate in Canada reached 26.9% up from 17.6% in 1995.
Adoption of Robson classification

- United Kingdom, Ireland, Scandinavia, and many centers worldwide

In Canada

- Child Health Network (GTA): 2010 birth review focused on Robson Groups 1 & 2
- BC Perinatal Health: 2001/2 and 2010/11 focused on Robson Groups 1, 2, 5, and 99
Examining CS rates in Canada using the Robson classification system

Sherrie Kelly¹, Ann Sprague¹, Deshayne Fell¹, Phil Murphy², Nancy Aelicks³, Yanfang Guo⁴, John Fahey⁵, Leeanne Lauzon⁵, Heather Scott⁵, Lily Lee⁶, Brooke Kinniburgh⁶, Monica Prince¹, Mark Walker¹, 4, 7

¹BORN Ontario and the CHEO Research Institute
²Newfoundland and Labrador Provincial Perinatal Program
³Alberta Perinatal Health Program
⁴Ottawa Hospital Research Institute
⁵Reproductive Care Program of Nova Scotia
⁶Perinatal Services British Columbia
⁷University of Ottawa Faculty of Medicine

Accepted in the JOGC
Rate of CS using Robson classification

- BC, AB, ON, NS, NL (EHA 70% of NL births)
- 2007-08 to 2010-11
- 965,499 women who gave birth
- ~64% of births in Canada
Rate of cesarean section by province, 2010-2011

- British Columbia: 31.7%
- Alberta: 27.1%
- Saskatchewan: 27.0%
- Ontario: 28.3%
- New Brunswick: 32.1%

Canada (CIHI): 26.9%
Rate of cesarean section by province, 2007-2008 to 2010-2011

Data source – Provincial Perinatal Database Systems
Rank contribution of Robson groups to overall CS rate – 5 provinces

1. Nulliparous, singleton, cephalic, term, spontaneous labour #3
2. Nulliparous, singleton, cephalic, term, induced or CS before labour #2
3. Multiparous, singleton, cephalic, term, without a previous CS, spontaneous labour
4. Multiparous, singleton, cephalic, term, without a previous uterine scar, induced labour or by CS before labour
5. Multiparous, singleton, cephalic, term, with a previous CS #1
6. Nulliparous, singleton, breech
7. Multiparous, singleton, breech
8. Multiple pregnancy (twins or higher-order multiples)
9. Singleton, transverse or oblique lie
10. Singleton, cephalic, pre-term

All remaining records that could not be classified due to missing information on one or more of the following variables: presentation, parity, gestational age, type of labour or previous cesarean.
#1 Largest contribution to CS rate

Robson Group 5 - previous CS and a term, singleton, cephalic pregnancy

CS rate

- 2010-11: 76.1% in AB to 89.9% in NL
- 2007-8 to 2010-11: decreased slightly other than in ON showed slight increase

- Accounting for 11.3% of all deliveries
#2 Largest contribution to CS rate

Robson Group 2 - nulliparous women with a term, singleton, cephalic pregnancy who were induced labour or CS before labour

- CS rates: 34.4% in NS to 44.6% in BC in 2010-11
- Accounting for 13.1% of all deliveries
#3 Largest contribution to CS rate

**Robson Group 1** - nulliparous women with a term, singleton, cephalic pregnancy with spontaneous labour

- CS rates: 14.5-20.3% in 2010-2011
- Accounting for 23.6% of all deliveries

*Note: Group 1 and 2 reversed for contribution in BC*
Implementation & Contribution

• **Easily implemented** across different countries, hospitals and systems
  – studies in Latin America (120 hospitals in 8 countries) and North America, Europe, Australia, and New Zealand (9 hospitals in 9 countries)

• **Robust and useful tool for ongoing surveillance**

• **Group 5** (previous CS, term, singleton, cephalic) makes the **largest contribution** to the overall CS is consistent with the results from Robson’s studies and international findings
Targeting reduction of CS

**Repeat CS** - Robson Group 5

*Best way to reduce the overall CS rate is by preventing the first CS*

**Primary CS** - Robson Groups 1 & 2

- **medical factors**: increases in maternal age & pre-pregnancy BMI, changes in obstetric practice - increased use of electronic fetal monitoring, labour induction, epidural anesthesia - reduced use of midpelvic forceps
- **non-medical factors**: CS requested by mother, fear of litigation among caregivers, and inappropriate organization of maternity care

**Other**: support VBAC and breech vaginal birth where feasible and appropriate
Primary Caesarean Section Rates, by Age Group in Canada, 2010–2011

Notes
Data represents the province or territory the patient was from (excluding non-residents of Canada).
I represents the 95% confidence interval.
The solid grey line is the Canadian primary C-section rate for women younger than age 35; the solid black line is the Canadian primary C-section rate for women age 35 and older.

Coverage issues:
Two small acute care facilities in Ontario did not submit data to CIHI in 2010–2011.
Repeat Caesarean Section Rate in Canada, 2010–2011

Notes
Data represents the province or territory the patient was from (excluding non-residents of Canada). I represents the 95% confidence interval.

The solid grey line is the Canadian repeat C-section rate for all ages.

Coverage issues:
Two small acute care facilities in Ontario did not submit data to CIHI in 2010–2011.

Source
Hospital Morbidity Database, Canadian Institute for Health Information.
Limitation of 5 province study

• >5,000 CSs could not be classified due to **missing data** (CS rate 56.6% in 2010-11, would be 4th largest contributor)

• Imperative to document in BIS:
  • type of presentation
  • parity
  • gestational age
  • type of labour
  • whether there was a previous CS
Limitations of Robson

• Purpose is to identify contributors to differences in CS rates across subgroups, but does not provide an explanation for these differences, nor look at the specific reason for performing the CS, e.g. indication
  – Clinical audit is the next important step
• Institution-specific quality improvement initiatives are needed to address this issue.
Conclusion of study

- All hospitals and health authorities can use the Robson classification system as part of a quality improvement initiative to monitor CS.
  - New SOGC Guidelines

- Identifies target areas for interventions and resources to reduce CS.
Strategies for reduction of CS

- Implement customized targeted **quality improvement** strategies with rapid “plan/do/study/act” cycles to quickly effect change
  - Audit & feedback
  - Second opinion
  - Guideline implementation: team agreement with mothers, HCPs and stakeholders

- Re-consider VBAC deliveries and breech VBs where feasible and appropriate
Classification of Caesarean Sections in Canada: The Modified Robson Criteria

Abstract

Objective: To advocate for the use of a common classification system for Caesarean section across Canada.

Recommendation

Modified Robson criteria should be used to enable comparison of Caesarean section rates and indications. (III-B)
Modified Robson criteria

1. Nullipara, singleton cephalic, ≥ 37 weeks, spontaneous labour
2. Nullipara, singleton cephalic, ≥ 37 weeks
   A: Induced
   B: Caesarean section before labour
3. Multipara, singleton cephalic, ≥ 37 weeks, spontaneous labour
4. Multipara, singleton cephalic, ≥ 37 weeks
   A: Induced
   B: Caesarean section before labour
5. Previous Caesarean section, singleton cephalic, ≥ 37 weeks
   A: Spontaneous labour
   B: Induced labour
   C: Caesarean section before labour
6. All nulliparous breeches
   A: Spontaneous labour
   B: Induced labour
   C: Caesarean section before labour
7. All multiparous breeches
   (including previous Caesarean section)
   A: Spontaneous labour
   B: Induced labour
   C: Caesarean section before labour
8. All multiple pregnancies
   (including previous Caesarean section)
   A: Spontaneous labour
   B: Induced labour
   C: Caesarean section before labour
9. All abnormal lies
   (including previous Caesarean section but excluding breech)
   A: Spontaneous labour
   B: Induced labour
   C: Caesarean Section before labour
10. All singleton cephalic, ≤ 36 weeks
    (including previous Caesarean section)
    A: Spontaneous labour
    B: Induced labour
    C: Caesarean section before labour
SOGC Summary

• Common classification of CS rates and indications allows evaluation and comparison of the contributors to the CS rate and their impact.

• Allows comparison between institutions, regions, and countries.
Figure 4.15. Rate of cesarean delivery, by Robson classification groups
# Rate of cesarean section, by Robson classification groups

Hospital 1, April 1, 2008 to March 31, 2010

<table>
<thead>
<tr>
<th>Robson classification group</th>
<th>A</th>
<th>B</th>
<th>Rate of cesarean (A/B) x 100</th>
<th>Relative size of group (B/Total obstetrical population) x 100</th>
<th>Contribution to overall rate (A/Total obstetrical population) x 100</th>
</tr>
</thead>
<tbody>
<tr>
<td># of cesarean sections</td>
<td>n</td>
<td>n</td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>1 Nulliparous, singleton, cephalic, ≥37 weeks, spontaneous labour</td>
<td>2,692</td>
<td>16,925</td>
<td>15.9</td>
<td>24.7</td>
<td>3.9</td>
</tr>
<tr>
<td>(1a) Augmentation</td>
<td>2,000</td>
<td>10,000</td>
<td>20.0</td>
<td>14.6</td>
<td>2.9</td>
</tr>
<tr>
<td>(1b) No Augmentation</td>
<td>692</td>
<td>6,925</td>
<td>10.0</td>
<td>10.1</td>
<td>1.0</td>
</tr>
<tr>
<td>2 Nulliparous, singleton, cephalic, ≥37 weeks, induced labour or cesarean before labour</td>
<td>3,037</td>
<td>7,839</td>
<td>38.7</td>
<td>11.4</td>
<td>4.4</td>
</tr>
<tr>
<td>(2a) Induced labour</td>
<td>2,000</td>
<td>6,000</td>
<td>33.3</td>
<td>8.7</td>
<td>3.7</td>
</tr>
<tr>
<td>(2b) Cesarean before labour</td>
<td>1,037</td>
<td>1,839</td>
<td>56.4</td>
<td>2.7</td>
<td>1.1</td>
</tr>
<tr>
<td>3 Multiparous, singleton, cephalic, ≥37 weeks, no previous cesarean, spontaneous labour</td>
<td>489</td>
<td>16,404</td>
<td>3.0</td>
<td>23.9</td>
<td>0.7</td>
</tr>
<tr>
<td>(3a) Augmentation</td>
<td>400</td>
<td>6,404</td>
<td>6.2</td>
<td>9.3</td>
<td>0.6</td>
</tr>
<tr>
<td>(3b) No Augmentation</td>
<td>89</td>
<td>10,000</td>
<td>0.9</td>
<td>14.6</td>
<td>0.1</td>
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<tr>
<td>...</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>6 Nulliparous, singleton, breech</td>
<td>1,361</td>
<td>1,456</td>
<td>93.5</td>
<td>2.1</td>
<td>2.0</td>
</tr>
<tr>
<td>7 Multiparous, singleton, breech</td>
<td>1,017</td>
<td>1,126</td>
<td>90.3</td>
<td>1.6</td>
<td>1.5</td>
</tr>
<tr>
<td>8 Multifetal pregnancy</td>
<td>714</td>
<td>1,151</td>
<td>62.0</td>
<td>1.7</td>
<td>1.0</td>
</tr>
<tr>
<td>9 Singleton, transverse or oblique lie</td>
<td>404</td>
<td>479</td>
<td>84.3</td>
<td>0.7</td>
<td>0.6</td>
</tr>
<tr>
<td>10 Singleton, cephalic, ≤37 weeks</td>
<td>931</td>
<td>3,564</td>
<td>27.7</td>
<td>4.9</td>
<td>1.4</td>
</tr>
<tr>
<td>All others with missing information on presentation, parity, gestational age, type of labour or previous cesarean</td>
<td>2,513</td>
<td>7,640</td>
<td>32.9</td>
<td>11.1</td>
<td>3.7</td>
</tr>
<tr>
<td>TOTAL POPULATION</td>
<td>19,305</td>
<td>68,581</td>
<td>28.1</td>
<td>100.0</td>
<td>28.1</td>
</tr>
</tbody>
</table>

Data source: BORN Ontario, 2008-2010
Conclusion

• Reducing CS rates can seem daunting because there are so many contributing factors.

• Determining the most important contributors for CS rates, gives you a place to begin.

• Target your quality improvement strategies where you will see the biggest impact:
  – Clinically meaningful
  – Feasible to measure
  – Actionable
Questions?

www.BORNOntario.ca
info@BORNOntario.ca

Sherrie Kelly
shekelly@BORNOntario.ca
613-737-7600 ext 6019