Institute for Safe Medication Practices Canada
REPORT MEDICATION INCIDENTS
Online: www.ismpcanada.ca/report/
Phone: 1-866-544-7672

A KEY PARTNER IN
CMIRPS Canadian Medication Incident Reporting and Prevention System
SCDPIM Système canadien de déclaration et de prévention des incidents médicamenteux

ISMP Canada Safety Bulletin

Volume 25 • Issue 4 • April 9, 2025

Shared Learning from the International Medication Safety Community: NHS Alert on Risk of Oxytocin Overdose

Monitoring patient safety alerts issued by national and international organizations, including the World Health Organization, the National Health Service (NHS; United Kingdom), the Australian Commission on Safety and Quality in Health Care, and the International Medication Safety Network (IMSN), can support proactive risk assessment and the strengthening of medication-use systems. This bulletin shares information published by NHS England in September 2024 describing the risks of oxytocin overdose during labour and childbirth,[1] and considers the Canadian context.

BACKGROUND

Oxytocin is a high-alert medication.[2] Low-dose intravenous (IV) infusions of oxytocin are used to induce labour whereas at higher doses, oxytocin can be used to manage postpartum hemorrhage.[3]

The National Patient Safety Alert from NHS England highlights the following incident examples:[1]

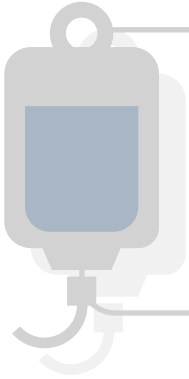
- Mix-ups between bags of IV oxytocin and bags of plain IV fluids (500 mL or 1000 mL), resulting in unintentional administration of oxytocin during labour, at rates intended for IV fluids (used for maintenance or hydration).
- Mix-ups between bags of IV oxytocin intended for use postpartum (higher concentration) and those intended for use before and during labour (lower concentration), resulting in fetal hypoxia and placental abruption.

Intravenous Oxytocin Safety Issues Identified in the Alert from NHS England

SITUATION:
Bags of intravenous (IV) oxytocin are prepared before the medication is ordered to enable rapid initiation of oxytocin infusions in urgent situations (e.g., to manage postpartum hemorrhage).

SAFETY ISSUES:
(1) Bags of IV oxytocin can be inadvertently selected and administered instead of plain IV fluids.
(2) Where different concentrations of oxytocin are used for different indications, the bags of IV oxytocin for use postpartum (higher concentration) can be inadvertently selected and administered instead of those for use during labour (lower concentration).

KEY CONTRIBUTING FACTOR:
Oxytocin infusions are pre-prepared on the unit in advance of need.



Pharmaceutical induction and augmentation of labour is high risk and ranked as one of the top risks identified by the Healthcare Insurance Reciprocal of Canada (HIROC).
(Communication with HIROC, 2025)

THE CANADIAN CONTEXT

The alert from NHS England was assessed for applicability in Canada by

- reviewing previous learning and analyzing recent reports of oxytocin-related incidents*
- consulting with Canadian experts regarding the current local risk for errors similar to those described in the alert

Shared Learning from Reports of Incidents

Multi-incident analyses of incidents involving oxytocin conducted in 2013 (n = 93 incidents) and 2019 (n = 144 incidents) have been shared in previous issues of the ISMP Canada Safety Bulletin.[4,5] The first of these publications identified the lack of labelling of pre-prepared bags of oxytocin as a key factor contributing to selection errors. The second publication described continued concerns about the lack of, or poor quality of, labelling of bags containing oxytocin, as well as challenges with safe storage, problems with IV pump and line setup, confusion about the rates of infusion, and gaps in communication and documentation.

Incident Example: *An unlabelled bag of what was presumed to be plain IV fluids was retrieved and administered to a patient. Staff later noted maternal uterine cramping and fetal heart rate deceleration. It was discovered that the bag contained oxytocin. The patient required emergency caesarean section.*[5]

An analysis of oxytocin incidents submitted in the past 5 years (2020–2024; n = 65) was undertaken. Some reports described pre-prepared oxytocin doses intended for postpartum use being available in the patient care area during labour, as well as bags and syringes containing oxytocin that were unlabelled.

Incident Example: *Pre-prepared unlabelled syringes of oxytocin and an opioid were placed together at the bedside. The opioid was given in error. Fortunately, there was no harm to the patient or the baby.*

Consultation with Canadian Experts

Canadian health care providers confirmed the following unsafe practices:

- oxytocin being prepared before it is ordered (e.g., in busy clinical areas)
- syringes or bags containing oxytocin being unlabelled
- oxytocin being available in the patient care area before the intended stage of labour

In Canada, most hospitals continue to prepare bags and syringes of oxytocin in patient care areas. Ready-to-use formats of oxytocin are available.[6]

RECOMMENDATIONS

Subsequent to review of the alert from NHS England, analysis of reports of incidents, and consultation regarding obstetric practice in Canada, the following strategies are recommended.

Protocols/Order Sets

- Ensure protocols, supporting procedures, and order sets related to oxytocin (e.g., for induction of labour or management of postpartum hemorrhage) are readily available.[7,8]
  - Define roles and responsibilities of interprofessional team members for prescribing, preparing, administering, and monitoring of oxytocin.[9,10,11]
  - Incorporate standardized safety checks for oxytocin, to be completed before and during administration.[5] Safety checks could be integrated in detailed order sets or be part of a safety checklist.[12,13]
  - Provide guidance for when oxytocin should be made available in the patient care area.
  - Outline documentation requirements (e.g., patient consent, dosing and administration, and continuous monitoring).
  - Require independent double checks at vulnerable steps involving oxytocin (e.g., when preparing

* The reports were submitted to the Consumer Reporting program, the Individual Practitioner Reporting database, and the Canadian Institute for Health Information's National System for Incident Reporting (NSIR), all of which are components of the Canadian Medication Incident Reporting and Prevention System (CMIRPS). The analyses, conclusions, opinions, and statements expressed herein are those of ISMP Canada.

solutions for infusion and when programming infusion pumps).[5]

Preparation/Dispensing

- Avoid pre-preparing IV oxytocin in any patient care area before it is ordered and required.[1,14]
- When possible, standardize oxytocin infusions to a single concentration for use during induction, labour and/or postpartum.[14,15]
- Standardize the labelling of prepared bags and syringes containing IV oxytocin. Prominently label both sides of the bag to differentiate it from plain IV fluids and other infusions.[14]
- Where possible, supply IV oxytocin in a ready-to-use format from pharmacy or a manufacturer, to reduce the risk of preparation errors.[5,14]

Storage and Administration

- Use infusion pumps with dose error reduction software to administer IV oxytocin, with safety parameters for each indication (e.g., specific soft and hard stops for induction, labour, and postpartum hemorrhage).
- Implement barcode scanning of oxytocin-containing products prior to administration, where available.[14]
- Stock postpartum hemorrhage kits in all clinical care units where they may be required (e.g., birthing suites, postpartum care areas); the kits should be readily accessible (e.g., in automated dispensing cabinets). The use of kits permits oxytocin to be readily available to manage postpartum hemorrhage during the second stage of labour, or thereafter, while sequestering doses away from patients in labour.[1]

Patient Education

- Discuss the benefits and risks of oxytocin with patients and engage them in monitoring and communication with health care providers.[15,16] A resource kit is available here: https://ismpcanada.ca/resource/oxytocin-safety/

CONCLUSION

In Canada, learning and sharing from analyses of oxytocin incidents, as reported by health care organizations, pharmacies, and individuals, inform opportunities for continuous improvement. The alert from NHS England highlights how reports of oxytocin incidents in one country can help inform safety globally.

ACKNOWLEDGEMENTS

ISMP Canada gratefully acknowledges the consumers, health care providers, hospitals, and organizations who have reported medication incidents for analysis and shared learning. The expert review of this bulletin by the following individuals (in alphabetical order) is also recognized and appreciated:

Sharon Dore RN PhD, Associate Clinical Professor, Department of Obstetrics & Gynecology, McMaster University, Hamilton, ON; Dr. Brian Edwards, Vice-President, International Society of Pharmacovigilance, Surrey, UK; Sebastian R Hobson MD PhD MPH FRANZCOG FACOG FRCSC, Maternal Fetal Medicine Specialist, Head of Labour & Delivery, Mount Sinai Hospital, Chair, Clinical Obstetrics Committee, Society of Obstetricians & Gynaecologists of Canada, Toronto, ON; National Patient Safety Team (Advice & Guidance), NHS England, London, UK; Brandi Newby RPh BScPharm ACPR, Pharmacy Coordinator, Neonatal and Pediatric Pharmacy, Surrey Memorial Hospital, Surrey, BC; Kailey Somerville RN, Quality and Safety Lead, BC Women's Hospital, Vancouver, BC; Laura Zahreddine RN BScN MN, Senior Program Manager, Provincial Council for Maternal and Child Health, Toronto, ON.

REFERENCES

1. National Patient Safety Alert: Risk of oxytocin overdose during labour and childbirth. London (UK): NHS England; 2024 Sep [cited 2024 Dec 17]. Available from: patient-safety-alert-risk-of-oxytocin-overdose-during-labour-and-childbirth.pdf
2. High-alert medications list. Toronto (ON): ISMP Canada; 2024 [cited 2024 Dec 17]. Available from: https://ismpcanada.ca/resource/highalertlist/
3. Oxytocin injection USP. 10 USP units/mL [product monograph]. Kirkland (QC): Pfizer Canada Inc.; [cited 2024 Dec 19]. Available from: https://pdf.hres.ca/dpd_pm/00048775.PDF
4. Aggregate analysis of oxytocin incidents. ISMP Can Saf Bull. 2013 [cited 2025 Jan 6];13(11):1-4,7. Available from: https://ismpcanada.ca/wp-content/uploads/ISMPCSB2013-11_OxytocinIncidents.pdf
5. Errors associated with oxytocin use: a multi-incident analysis. ISMP Can Saf Bull. 2019 [cited 2024 Dec 17];19(8):1-5. Available from: https://ismpcanada.ca/bulletin/errors-associated-with-oxytocin-use-a-multi-incident-analysis/
6. Ready-to-use products containing oxytocin. Mississauga (ON): Baxter Corporation. Available upon request to Baxter CIVA Canada.
7. Mismanagement of induction and augmentation of labour. Toronto (ON): Healthcare Insurance Reciprocal of Canada; 2023 [cited 2025 Jan 9]. Available from: https://www.hiroc.com/resources/risk-reference-sheets/mismanagement-induction-and-augmentation-labour
8. Failure to appreciate deteriorating pregnant and postpartum persons. Toronto (ON): Healthcare Insurance Reciprocal of Canada; 2023 [cited 2025 Jan 9]. Available from: https://www.hiroc.com/resources/risk-reference-sheets/failure-appreciate-deteriorating-pregnant-and-postpartum-persons
9. Robinson D, Basso M, Chan C, Duckitt K, Lett R. Guideline No. 431: Postpartum hemorrhage and hemorrhagic shock. J Obstet Gynaecol Can. 2022;44(12):1293-1310.e1. Errata in: J Obstet Gynaecol Can. 2023;45(3):241. J Obstet Gynaecol Can. 2024;46(5):102174.
10. Pre-use [and in-use] oxytocin safety checklist. Toronto (ON): Provincial Council for Maternal and Child Health. 2024 Jun [cited 2025 Feb 20]. Available from: https://www.pcmch.on.ca/wp-content/uploads/2022/02/Safe-Adminiatration-of-Oxytocin-Pre-and-In-Use-Checklists.pdf
11. Prevention and management of postpartum hemorrhage. Clinical Practice Guideline No. 17. Toronto (ON): Association of Ontario Midwives. 2024 [cited 2025 Apr 3]. Available from: https://www.ontariomidwives.ca/sites/default/files/2024-06/CPG-Postpartum%20Hemorrhage-2024-PUB.pdf
12. Labour and delivery order set – oxytocin induction and augmentation. Toronto (ON): Provincial Council for Maternal and Child Health. 2024 Jun [cited 2025 Feb 20]. Available from: https://www.pcmch.on.ca/wp-content/uploads/Safe-Adm-Oxytocin-Order-Set-2023mod-1.pdf
13. Recommendations for global implementation of safe oxytocin use practices. International Medication Safety Network: Oxytocin Safety Interest Group. 2023 [cited 2025 Feb 16]. Available from: https://www.intmedsafe.net/wp-content/uploads/2023/05/IMSN-OxytocinSIG-Recommendations-2023.pdf
14. Safe administration of oxytocin: standardizing practice to promote safe induction and augmentation of labor. Toronto (ON): Provincial Council for Maternal and Child Health. 2024 Jun [cited 2025 Feb 20]. Available from: https://www.pcmch.on.ca/wp-content/uploads/2022/02/Safe-Administration-of-Oxytocin-Guidance-Report.pdf
15. Institute for Safe Medication Practices Canada (ISMP Canada). Implementation Guide: Oxytocin to start or advance labour: 5 questions to ask. ISMP Canada; 2021. Accessed January 10, 2023. https://www.ismp-canada.org/download/Implementation-Guide-Oxytocin-Safety-EN.pdf
16. Watt A, Webel-Edgar L, Murray M, Noble J, Hyland S, Zahreddine L, et al. Oxytocin to start or advance labour: 5 questions to ask [poster]. Toronto (ON): Institute for Safe Medication Practices Canada and Healthcare Insurance Reciprocal of Canada; 2022 Jun 9 [cited 2025 Feb 27]. Available from: IHI2021posterOxytocinJune92022.pdf

CMIRPS SCDPIM

Canadian Medication Incident Reporting and Prevention System

Système canadien de déclaration et de prévention des incidents médicamenteux

The Canadian Medication Incident Reporting and Prevention System (CMIRPS) is a collaborative pan-Canadian program of Health Canada, the Canadian Institute for Health Information (CIHI), the Institute for Safe Medication Practices Canada (ISMP Canada) and Healthcare Excellence Canada (HEC). The goal of CMIRPS is to reduce and prevent harmful medication incidents in Canada.

Funding support provided by Health Canada. The views expressed herein do not necessarily represent the views of Health Canada.

HIROC

The Healthcare Insurance Reciprocal of Canada (HIROC) provides support for the bulletin and is a member owned expert provider of professional and general liability coverage and risk management support.

ISMP CANADA

The Institute for Safe Medication Practices Canada (ISMP Canada) is an independent national not-for-profit organization committed to the advancement of medication safety in all healthcare settings. ISMP Canada's mandate includes analyzing medication incidents, making recommendations for the prevention of harmful medication incidents, and facilitating quality improvement initiatives.

Report Medication Incidents

(Including near misses)

Online: www.ismpcanada.ca/report/
Phone: 1-866-544-7672

ISMP Canada strives to ensure confidentiality and security of information received, and respects the wishes of the reporter as to the level of detail to be included in publications.

Stay Informed

To receive ISMP Canada Safety Bulletins and Newsletters visit:

www.ismpcanada.ca/safety-bulletins/#footer

This bulletin shares information about safe medication practices, is noncommercial, and is therefore exempt from Canadian anti-spam legislation.

Contact Us

Email: cmirps@ismpcanada.ca
Phone: 1-866-544-7672

©2025 Institute for Safe Medication Practices Canada.