

# **IMP CAPHC ACCSP** Advancing Medication Safety in Paediatrics

## **A National Collaborative**



#### Introduction

Paediatric healthcare facilities face unique challenges in the medication delivery systems. It is well known that various patient and system factors place paediatric patients at greater risk of experiencing harm from medication errors, and that certain medications have a higher potential to cause harm when used in error.

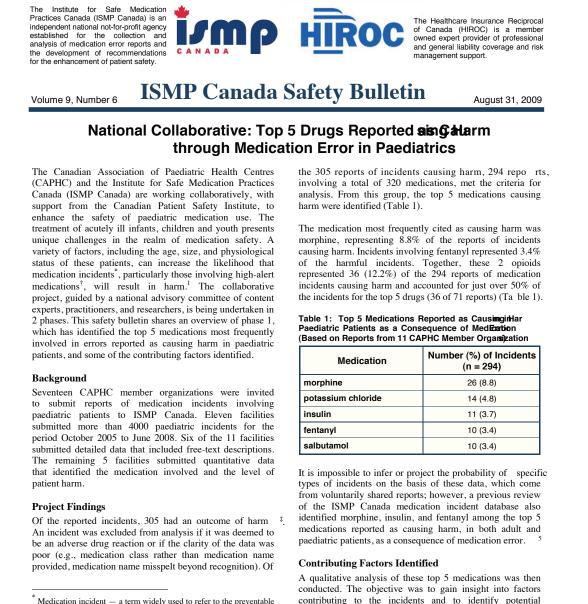
The Institute for Safe Medication Practices Canada (ISMP) Canada) and the Canadian Association of Paediatric Health Centres (CAPHC), with support from The Canadian Patient Safety Institute, Medbuy Inc., and Baxter Corporation have established a partnership intended to advance medication system safety in the delivery of high alert medications in Canadian paediatric facilities and community facilities that deliver paedatric care.

### Phase 1 - Identify Top 5 Drugs Causing Harm

- Identify the top medications reported to ISMP Canada as causing harm through medication error in Canadian paediatric healthcare settings;
- Identify existing leading practices; and
- Analyze the information obtained to develop solutions which form the basis of a medication safety intervention.

#### Results

(Based on 294 reports from 11 CAPHC Member Organizations)



oset of potential and actual adverse drug events; also recognized as interventions for improving system safety. Data for the

High-alert medications — drugs that bear a heighten, ed risk of reports received from 6 of the facilities, as described above

criteria for a category E error (i.e., categories E to I inclusive); harm and those not causing harm, were reviewed, to capture egory E is defined as "an error that may have contributed to or valuable insights that might also be gained from near-miss

in temporary harm to the patient and required intervention". and other no-harm reports.

qualitative analysis were limited to the detailed inciden

Specifically, all of the 482 detailed medication incider

reports involving the top 5 medications, both those causing

Medication	Number (%) of Incidents
morphine	26 (8.8)
potassium chloride	14 (4.8)
insulin	11 (3.7)
fentanyl	10 (3.4)
salbutamol	10 (3.4)

Reference: Institute for Safe Medication Practices Canada. National Collaborative: Top 5 Drugs Reported as Causing Harm through Medication error in Paediatrics. ISMP Canada Safety Bulletin 2009, August 31 Volume 9, Number 6.

#### Phase 2 - Transforming Opioid Delivery in Paediatrics

Develop a comprehensive set of recommendations and tools to ensure safe opioid medication practice including, but not limited to, methods of standardization of prescribing and administration, calculation tools, purchasing and storage.

#### **Opioid Safety Tactics**

A multi-disciplinary standardized developed approaches to opioid safety tactics. The 11 tactics encompass three groups of activities providing an optimal 'ladder of safety:

- 1. Fundamental System Safety Elements
- 2. Prescribing Standardization Elements
- 3. Dose Administration Standardization Elements

Opioid safety recommendations support standardization that is customized for community and tertiary hospitals.

#### **Community Hospital** Recomendations

In mixed units where adult and paediatric patients are being treated in the same area (e.g. Emergency Department, ambulatory care clinics), sequester paediatric opioids (narcotics) from adult opioid (narcotics).	1.4	
LIMIT the opioid injectable agent to morphine	1.3	
RESTRICT ACCESS to fentanyl injectable.  Exceptions:  If fentanyl is needed then provide guidelines for use including dosing. (For example: Rapid Sequence Intubation).  Hospitals with a NICU may require fentanyl 50 mcg/mL for admixing infusions.	1.3	
RESTRICT ACCESS to hydromorphone injectable to palliative care areas.	1.3	
EVALUATE the use of oral codeine liquid based on recent literature. Consider the use of oral morphine 1 mg/ml liquid as the opioid of choice.	1.3	
LIMIT the available concentration of morphine to : ORAL: Morphine oral liquid 1 mg/mL INJECTABLE: Morphine 2 mg/mL INFUSION: Morphine 0.2 mg/mL and 1 mg/mL	2.1 3.2	
STORE all oral opioids in pre-filled oral syringes.	1.4	
LABEL EVERY dose of injectable or oral opioid prepared by nurses away from the bedside. (e.g. in med room, anteroom etc.)	1.4	
ALL opioid orders for paediatric patients who weigh 50 kg or less must include the dosage by weight in: - (mg or mcg)/kg/hr or (mg or mcg)/kg/dose	2.2	
DEVELOP and DISSEMINATE institution wide dosingguidelines for commonly used opioids in paediatrics, including initial dose recommendations and initial max adult doses for opioid naive patients.	2.2	

#### Tertiary Hospital Recomendations

Paediatric Opioids Recommendations For TERTIARY Hospitals	Tactic	Aligned with Accreditation Canada	Aligned With HIROC
EVALUATE the use of oral codeine liquid based on recent literature.  Consider the use of oral morphine 1 mg/mL liquid as the oral opid of choice.	1.3		
ADOPT STANDARD CONCENTRATIONS of continuous opioid infusions to:  Morphine: 0.2 mg/mL and 1 mg/mL Hydromorphone: 250 mcg/mL and 40 mcg/mL Fentanyl: 50 mcg/mL and 25 mcg/mL **A dditional concentrations may be required for hospitals with extremely premature babies and hospitals without two decimal pumps**	2.1 3.2	1	1
STORE all oral opioids in pre-filled oral syringes.	1.4		
LABEL EVERY dose of injectable or oral opioid prepared by nurses away from the bedside (e.g. in med room, anteroom etc.)	1.4		
ALL opioid orders for paediatric patients who weigh 50 kg or less must include the dosage by weight in: - (mg or mcg)/kg/hr or (mg or mcg)/kg/dose	2.2	1	
DEVELOP and DISSEMINATE institution wide dosingguidelines for commonly used opioids paediatrics, including initial dose recommendations and initial max adult doses for opioid naive patients.	2.2		

Utilize an innovative approach by applying human factors expertise, and psychological theory and practice to design strategies for developing support for professionals in safe medication delivery practice.

#### **Human Factors Analysis**

Human factors analysis evaluated the effectiveness of moving from non-standard concentrations to standard concentrations and focused on the preparation of morphine solutions for IV infusions.

The study was conducted at CAPHC's Annual Conference in October 2009.

Human Factors results support the transition to standard concentrations to reduce errors.

- The task analysis showed that introduction of standard concentrations simplifies the calculations required.
- Calculation test participants made more errors when using the rule of six method than they did using the standard concentrations method.
- 67% of participants indicated that they found standardized calculation easier than rule of six.



## Phase 2 - Employed a New Equation for Change

**Opioid Safety Tactics** 



**Human Factors** Analysis



**Psychological** Insights



Safer Opioid Delivery

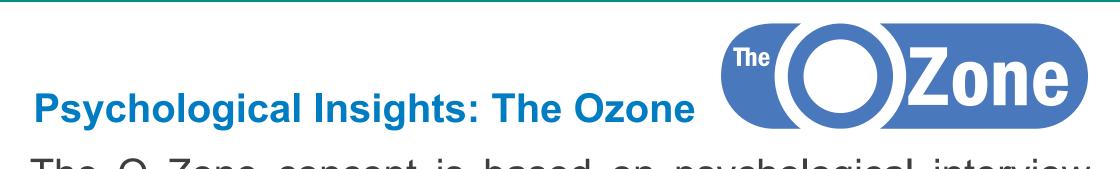
For the Phase II report and further information visit www.caphc.org or www.ismp-canada.org

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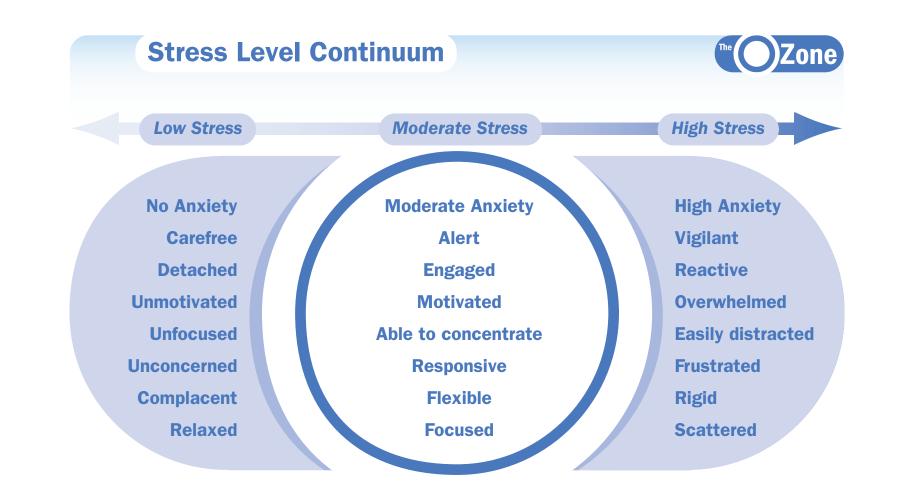


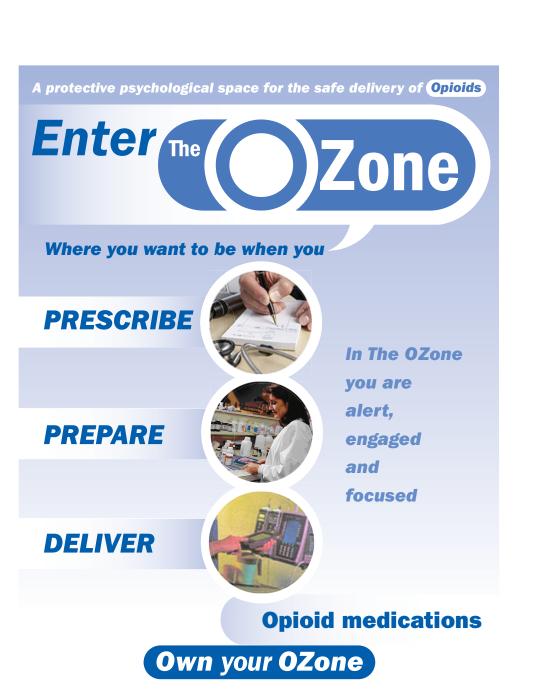


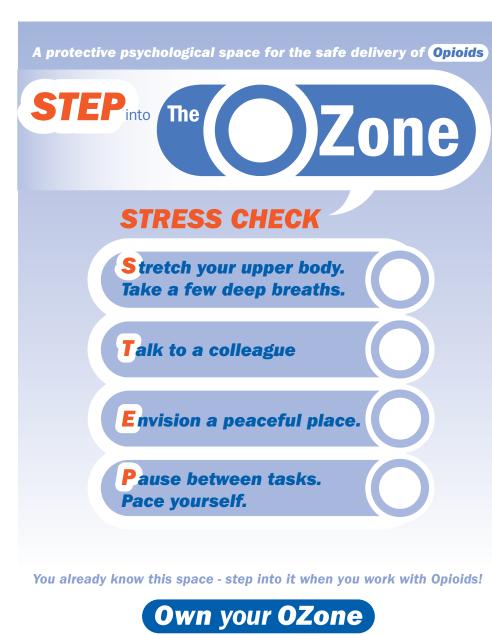


The O Zone concept is based on psychological interview findings and follow-up discussions with other healthcare professionals. It identifies a state described by many as a particular kind of space they know they're in when they are working most attentively and effectively. The O Zone is a name for that space.

Findings indicate an optimal psycho-physiological state to deliver opioids.







#### **Conclusions and Next Steps**

- Moving to standardized concentrations to reduce calculation and other errors.
- Customization of recommendations for community and tertiary hospitals.
- The benefits of an optimal psycho-physiological state adds a new dimension to engage and support practitioners involved in the delivery of paediatric opioids.

Future work will involve testing, validating and building support for these recommendations in the paediatric community across Canada.

Harm — any error meeting or exceeding the National Coordinating Council for Medication Error Reporting and Prevention (NCC MERP)