

# Smart Pumps: Applications and Implications

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Patricia Trbovich

Helen Edwards

Heather Colbert



Healthcare  
Human Factors  
University Health Network

**SickKids<sup>®</sup>**

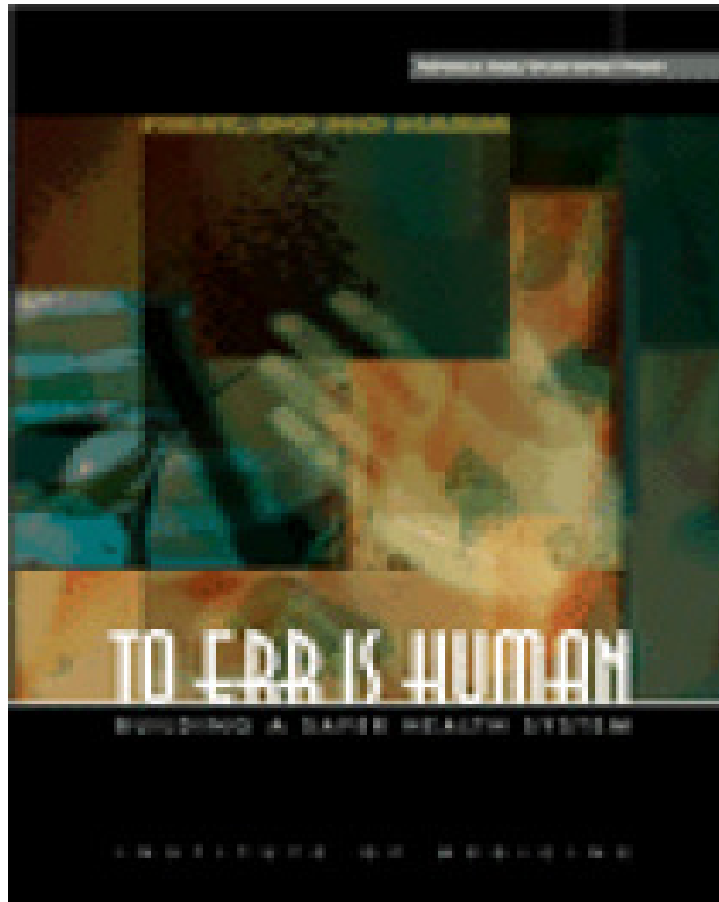
# Agenda

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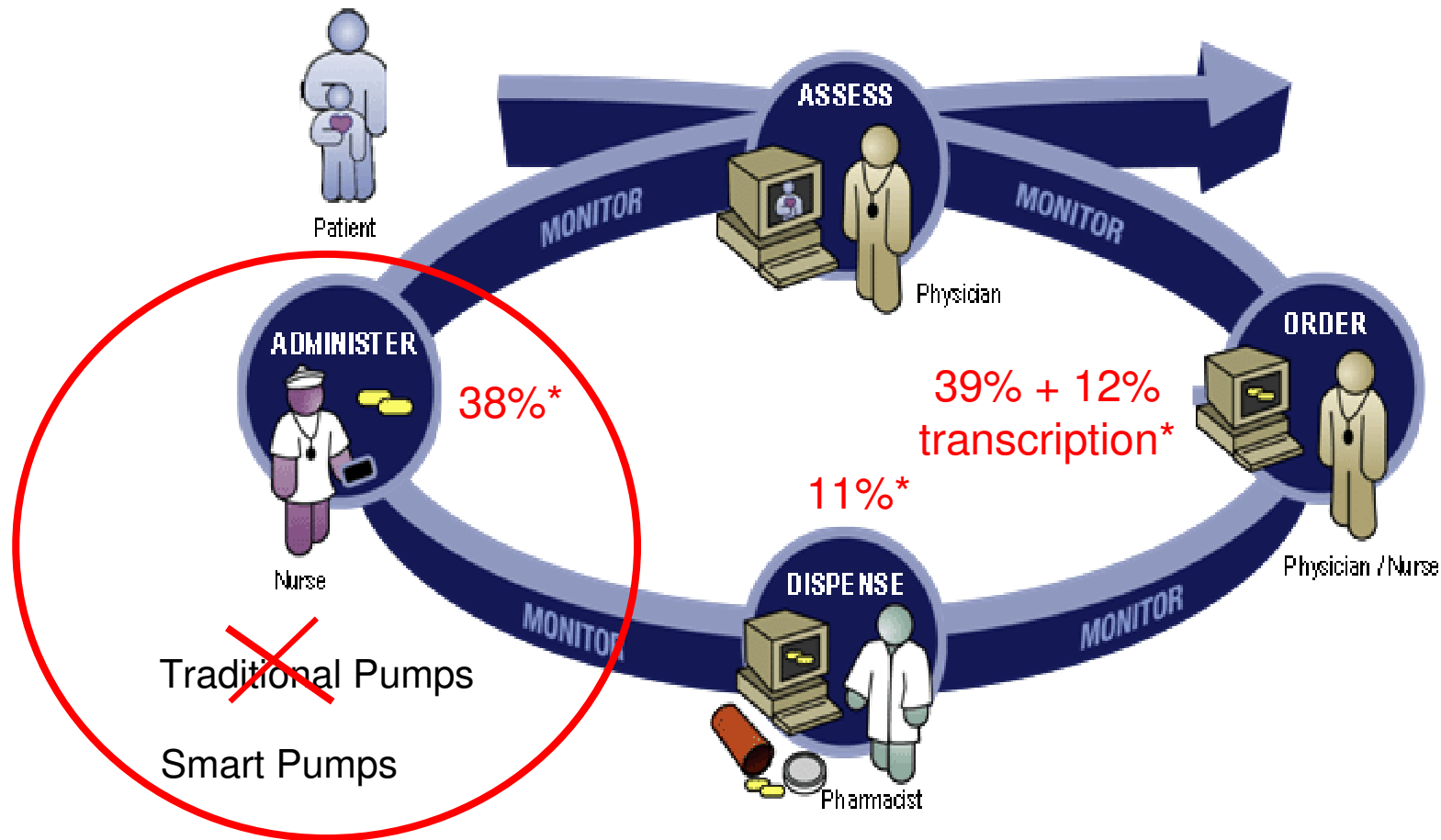
- Issue and Background
- Case Study #1
  - Sick Kids
- Case Study #2
  - Human Factors Analysis
- Future Work
  - MoH Project

# Project Background

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# Medication Administration Process



# Traditional Infusion Pumps

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- Programming issues
  - 0.1 ml/h is programmed as 1 ml/hr
  - 1.0 ml/h is programmed as 10 ml/h

# 3 Pump Types

Traditional Infusion Pump

Smart Infusion Pump

Smart Infusion Pump with Bar Coding



✓ Few input parameters

✗ Involved in high rate of ADEs

✓ Drug libraries (standard concentrations and dosing units)

✗ New tasks and conceptual model

✓ Smart pump is integrated with a bar-code medication administration system

✗ Not there yet

# Research Gap

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- Frequency of Errors
  - Traditional pumps > Smart Pumps
  - VS
  - Traditional pumps = Smart Pumps
- Literature focuses on individual case studies with limited baseline data
- No empirical research that assess effects of different types of pumps on clinicians' medication administration safety and efficiency

# Project Approach

Technology migration	1. “traditional” pump	2. “smart” pump	3. “Smart” pump with bar coding
Prong 1	<b>Lab study:</b> comparison of traditional, smart, and bar coding infusion pumps on medication administration safety & efficiency		
Prong 2 a)	<b>Field study:</b> successful factors for the migration from traditional to smart pump		
Prong 2 b)	<b>Survey:</b> Ontario implementation of smart pumps		

# Project Deliverables

Technology migration	1. "traditional" pump	2. "smart" pump	3. "Smart" pump with bar coding
Prong 1	<b>Q: Are we going down the right path?</b> <b>D: Evidence on the risks with each pump type</b>		
Prong 2 a)	<b>Q: How can we minimize migration risks?</b> <b>D: Emerging best practice</b>		
Prong 2 b)	<b>Q: What is the current state in Ontario?</b> <b>D: Data on diffusion and compliance with emerging best practice</b>		
<b>Future work</b>			

# Project Benefits

