



Preventing needlestick injuries in Ontario's acute care hospitals: Progress and ongoing challenges

Andrea Chambers

PhD Candidate, University of Toronto

IWH Plenary

November 19, 2013



Thesis Committee

- Dr. Cameron Mustard
- Dr. Curtis Breslin
- Dr. Linn Holness
- Dr. Kathryn Nichol

Advisory Committee Representation

- Public Service Health and Safety Association
- Ontario Hospital Association
- Ontario Nurses Association
- Ministry of Labour

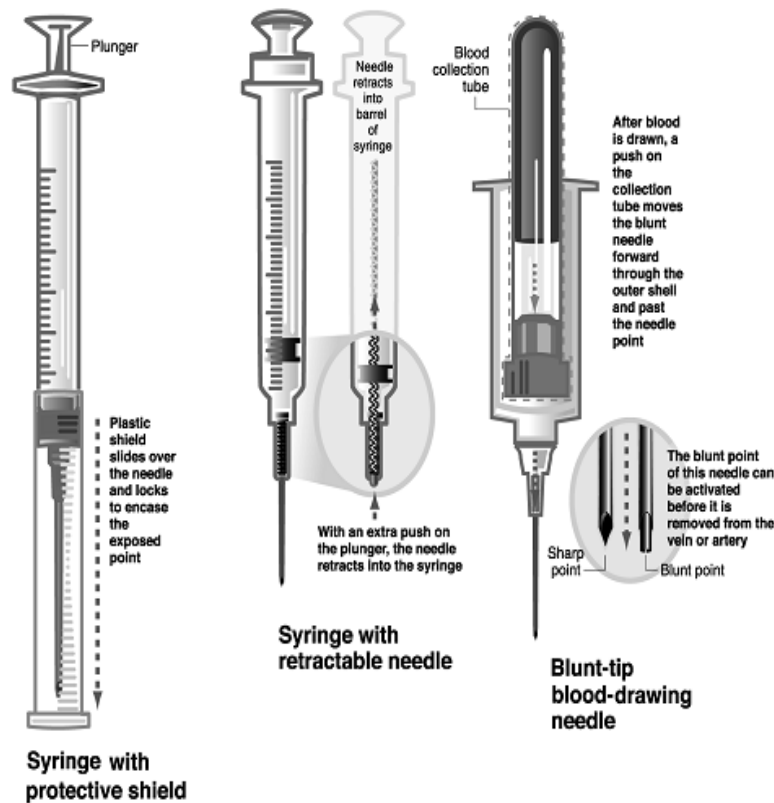


A case report

A hospitalized patient with AIDS became agitated and tried to remove the intravenous (IV) catheters in his arm. Several hospital staff members struggled to restrain the patient. During the struggle, an IV infusion line was pulled, exposing the connector needle that was inserted into the access port of the IV catheter. A nurse at the scene recovered the connector needle at the end of the IV line and was attempting to reinsert it when the patient kicked her arm, pushing the needle into the hand of a second nurse. The nurse who sustained the needlestick injury tested negative for HIV that day, but she tested HIV positive several months later

American Health Consultants (1992). Occupationally infected doctor says exposure was preventable. AIDS Alert. August 118-119.

Engineered controls for the prevention of needlestick injuries



Sources: Health Devices Magazine, industry advertising, and Chronicle research, Steve Kearsley, San Francisco Chronicle

Sources: BD, www.BD.com



Why regulate?

Burden

- 33,000 needlestick injuries in Ontario (Alliance for Sharps Safety and Needlestick Prevention)
- Primary source of occupational exposure to blood among healthcare workers
- 20 pathogens have been reportedly transmitted – including HIV, HBV, HCV
- Psychological impacts post-exposure

Cost:

- \$65-\$4,800 post-exposure testing and treatment (Lee et al., 2005)

Solution:

- Safety-engineered needles and medical sharps

Problem:

- The adoption of these devices by healthcare organizations was initially slow, in part due to the higher costs of SENs relative to conventional devices.



**Institute
for Work &
Health**

Research Excellence
Advancing Employee
Health

Have needlestick injuries declined in Ontario?



Administrative data sources

Workers' Compensation Claims

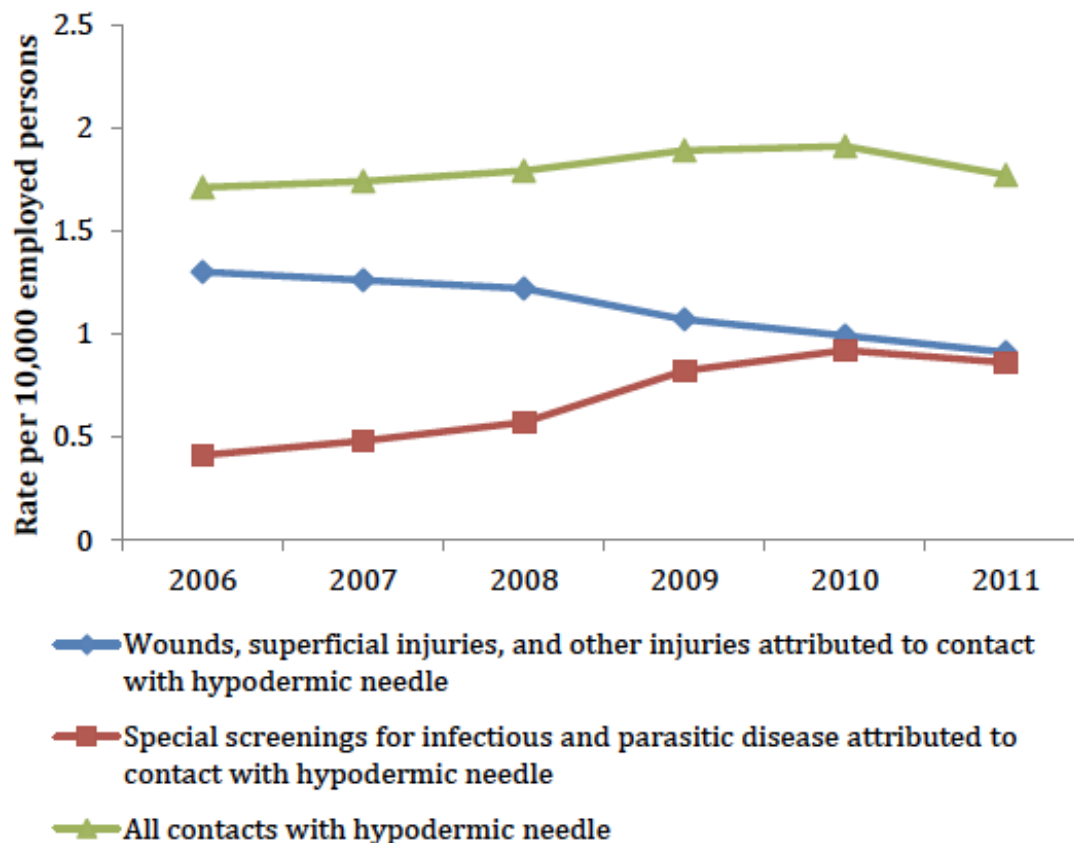
- Needlestick injuries resulting in lost-time or incidents captured in PEIR
- Custom tabulation request for needlestick injuries by year (2004-2012), claim type and rate group

Work-related Emergency Department Records

- Emergency visits where responsibility for payment code assigned to WSIB
- Case definition:
 - Contact with hypodermic needle (external cause)
 - Wound, superficial injury or other injury / special screening for infectious and parasitic disease (main problem)

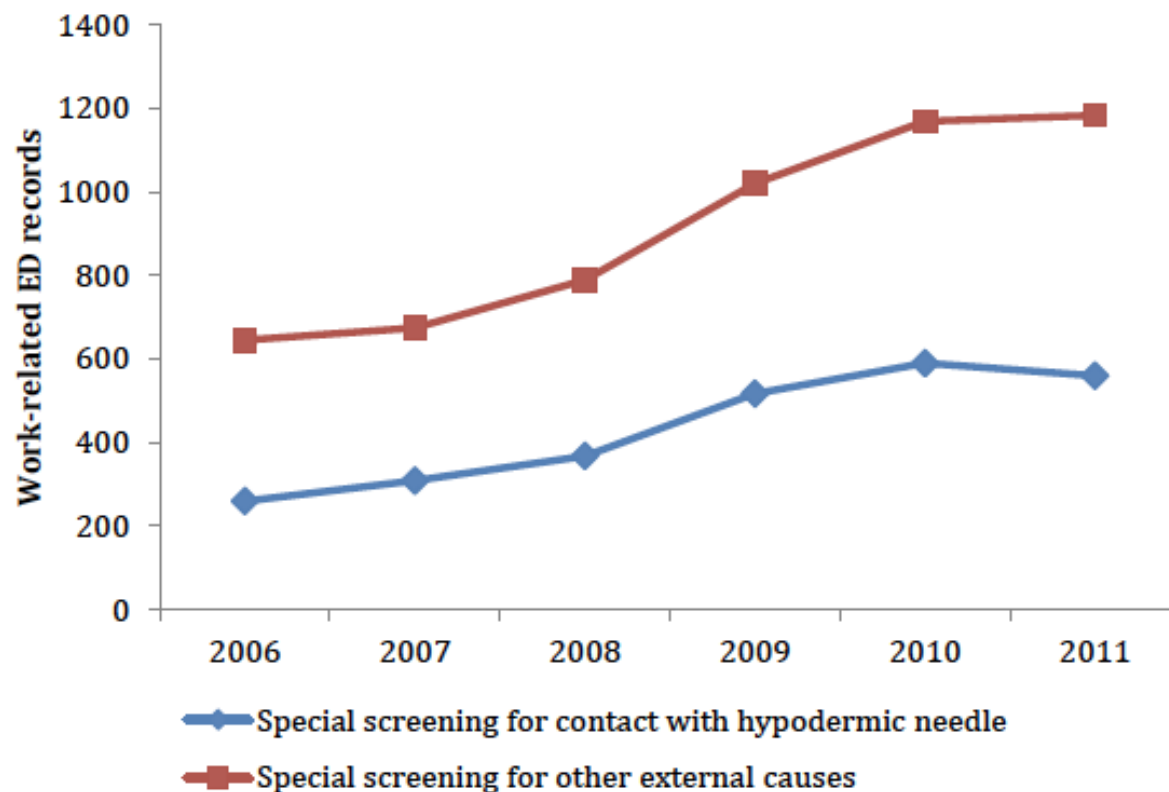


Work-related Emergency Department Records (Ontario)



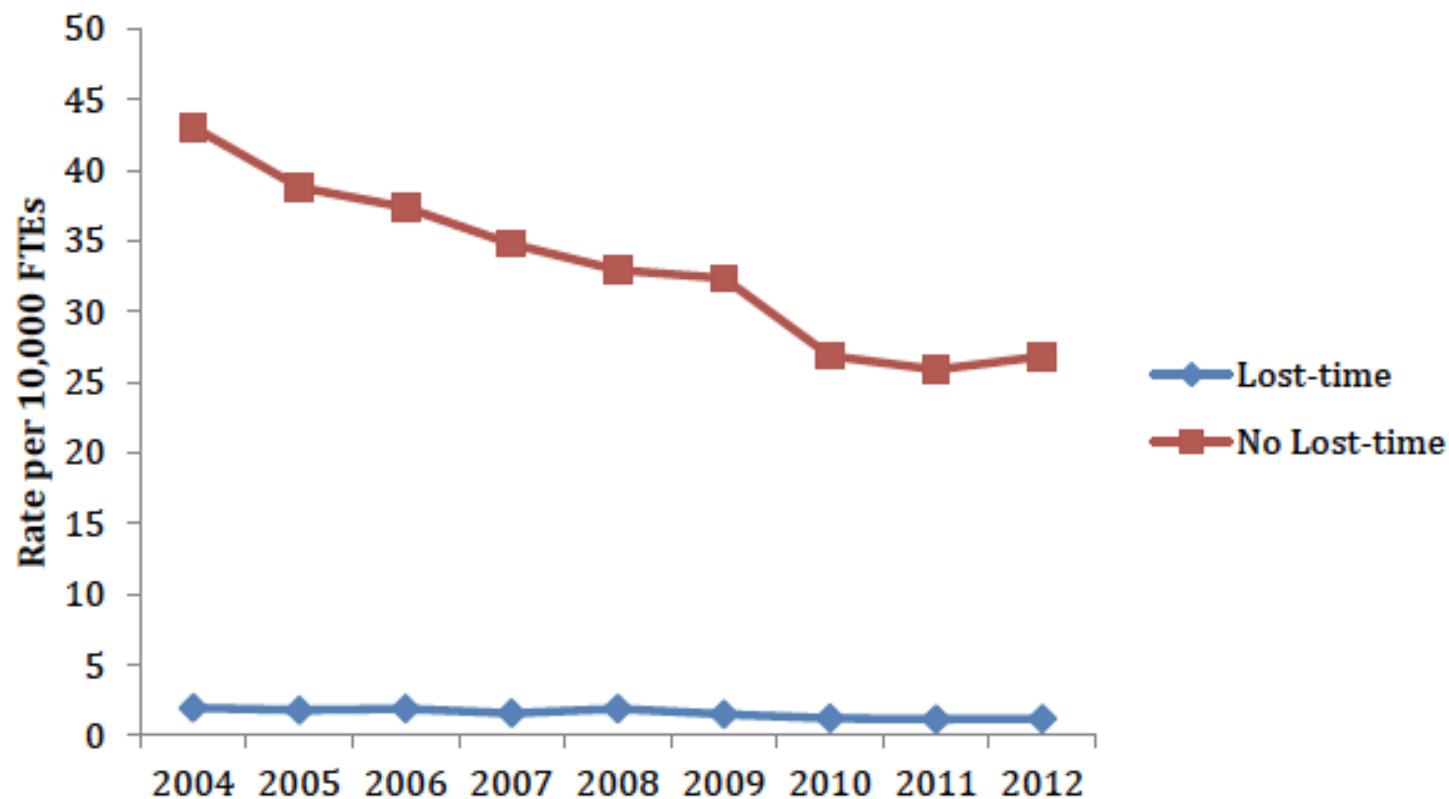


Work-related Emergency Department Records (Ontario)



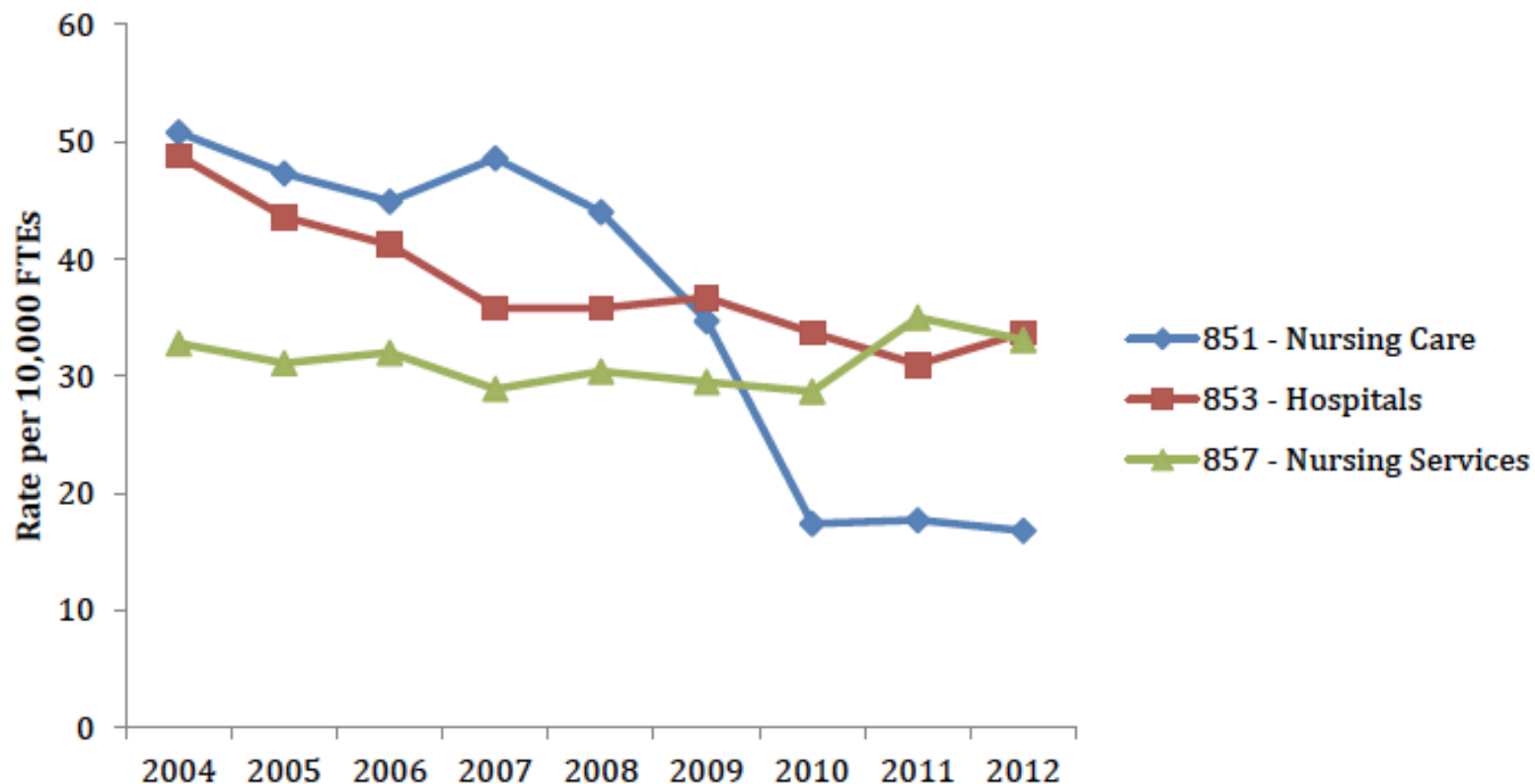


Ontario Workers' Compensation Claims





Ontario Workers' Compensation Claims



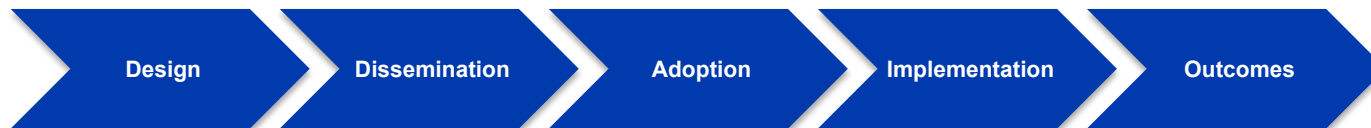


Why focus on implementation?

- Too often we report less than optimal impacts of system level intervention with an absence of information to contextualize unexpected or less than optimal results
- Ontario's regulatory standard on needle safety was designed to be *flexible* – how and what will be implemented is dependent on organizations



Implementation Science



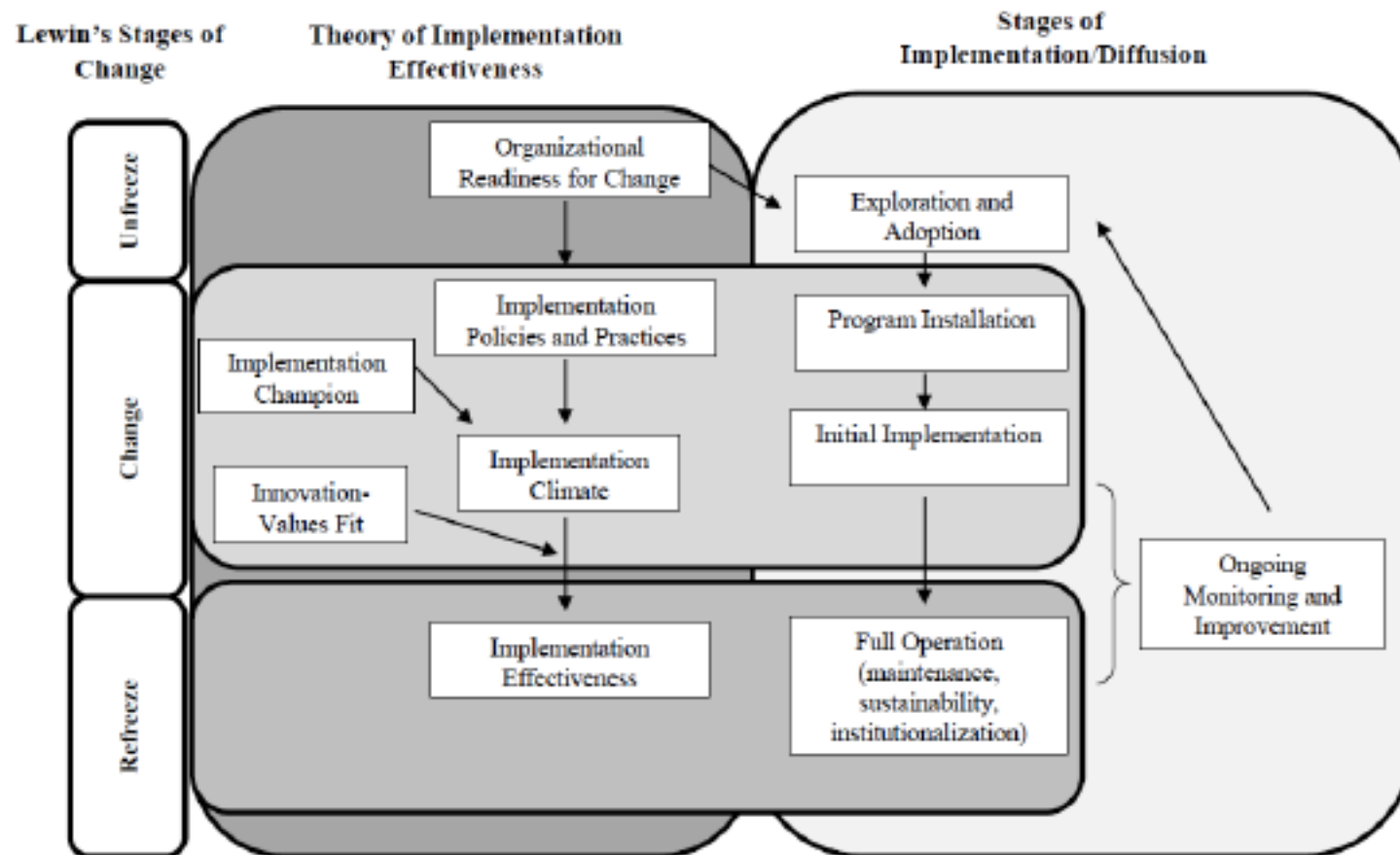
Implementation Science – a new interdisciplinary field that identifies structures, supports and conditions that promote the successful integration of new programs, innovations and ideas into practice.

Effective Innovations x Effective Implementation = Positive Outcomes

Source: National Implementation Research Network

Implementation Science

How do we accomplish successful implementation at the organizational level?





Research Methods

How did implementation play out in acute care hospitals?... How did hospitals respond and manage the integration of SENs?... Consequences of integrating these devices?... Remaining issues?

Interviews/document review and analysis

Ontario's Regulation

Acute Care
Hospital

Acute Care
Hospital

Acute Care
Hospital

Key informants

Analysis of policy/program/
media docs

Organizational informants

Front-line workers

Program documents

Mixed Sampling
Strategy

- Random purposeful
- Snowball
- Convenience



Research Methods

Organizational Informants

- Occupational health and safety
- Representatives from safer needle task force
- Joint Health and Safety Committee representatives
- Purchasing/procurement
- Logistics
- Professional practice / education

Front-line workers

- RNs & RPN
- Emergency, critical care, other*
- Frequently using SENs



The document sample

Organizational Documents

- Policies and procedures
- Injury statistics
- Newsletters
- Training program
- Online educational resources
- Safety device evaluation results
- Email correspondence
- News reports
- Terms of reference
- Task force meeting minutes
- Exemption request forms
- Employee survey results
- Ministry of Labour orders
- SEN cost comparison





Participant Sample

Respondents

Primary Informant Category:

Registered Nurse / Registered Practical Nurse	17
Organizational Informant	9
Clinical Manager / Supervisor	4

Health and Safety Role:

Occupational Health and Safety	4
JHSC	11
Safer Needle Task Force	6
None of the above	9

Gender:

Female	22
Male	8

Time in Current Organization:

Less than 5 years	5
5-10 years	9
More than 10 years	16



Interview questions

Staff Background

- Role in the implementation process
- Type of SENs in use

Needlestick Injuries

- Injury experience
- Impact of SENs on perceived injury risk

Staff Response

- SEN design preferences
- Feedback from staff during transition

Implementation Issues

- Availability of non-safety devices
- Reasons for inactive SENs
- Reasons ongoing injuries

Implementation Process

- Status/timing of transition
- Types SENs available
- Overall experience
- Internal & external facilitators

Ongoing Implementation

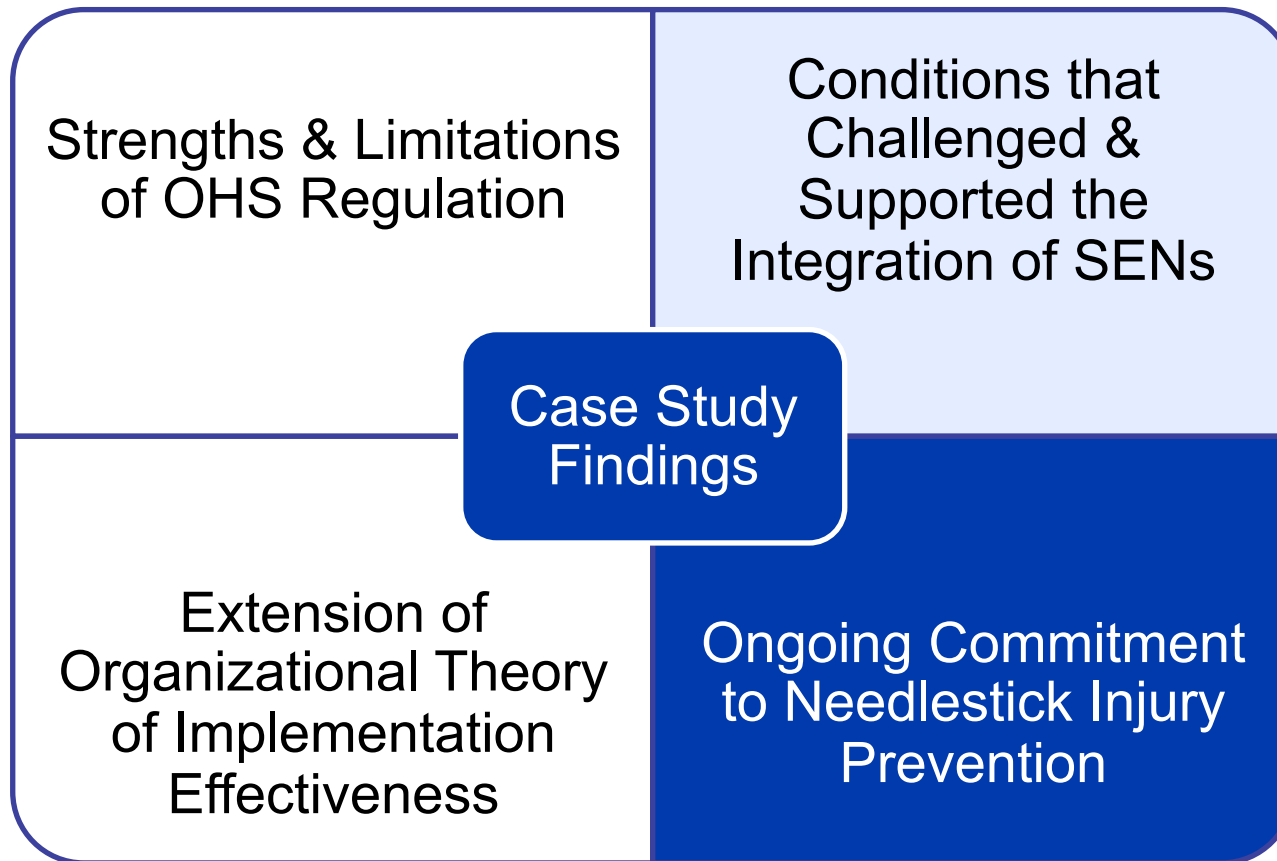
- Current priorities
- Ongoing implementation practices
- Review of exceptions
- Advances in SEN / SEMS use





Analysis

- Initial analysis involved preparing interview summaries for participants to review
- Iterative process guided data gathering and analysis; each informed the other.
- Use of implementation science & organizational change theory; theory played an important interactive role.
- Systematic data coding procedure to help navigate the data (topic codes) and to support the within and cross-case analysis
- Focus on description and synthesis rather than data reduction
 - Descriptive case reports
 - Thematic analysis





Three Case Reports

	The Extrinsic Late Adopter	The Extrinsic Early Adopter	The Intrinsic Early Adopter
Characteristics	Large teaching hospital	Multi-site community hospital	Large teaching hospital
Transition to Safety Needles	2007, in response to safer needle regulation	2006, in response to a workplace inspection order	2003, voluntary transition
Types of SENs	Mix of semi-automatic & manual	Mix of semi-automatic & manual	Mix of semi-automatic, manual, & passive
Challenges	<ul style="list-style-type: none">- Physician resistance- Product hoarding- SEN use- Training- Exceptions- Product failure- Financial approval	<ul style="list-style-type: none">- Senior management resistance- SEN use- Exceptions- Training	<ul style="list-style-type: none">- SEN use- Sharps disposal- Training
Relative decline in NSIs: year of transition to 2011	28%	61%	85%



Implementation Challenges

SENs were for the health and safety of front-line workers, it did not follow that the devices were immediately accepted and used...

Physician response to the transition

“I do think the doctors were probably one of the biggest, after the staff got used to them, the doctors were probably the biggest problem. I think they are a little more compliant, there’s still some that aren’t though. I don’t know how you fix that.”

Issues with safer needle use

- Safety features not being used / modified
- Product hoarding:

“The other issue that does occur and I am sure its occurred in many hospitals is some staff will try to steal, hoard the old needles and we have found here and there stashes of non-safety needles that staff were hiding.”



Performance First

An important influence on how front-line workers responded to SENs was an apparent conflict between the changes imposed by the new SENs and the values shared by front-line workers towards their **performance**.

“You’re taking people who are used to for example holding a wing set in a certain way and applying it and they’re now masters of that and now you’re suddenly asking them to use something in a different way and anybody who draws blood for a living will bawlk against it.”

Care providers prioritized their skill and performance, the ability to care for their patients, to get the job done.. these values appeared to influence how they responded to the new safety technology...



Implementation Challenges

Ongoing needlestick injuries

- During activation
- During a procedure and as a result of patient action.
- Sharps disposal practices

“We have the cap that flips over the needles, the butterflies have a little device that you retract up, not the easiest device to use but if you're in a contained stable environment it's fine but if you have a patient who's not very cooperative, I have been stuck by one of the butterflies before because I couldn't get the sleeve up to cover it...”



Learning Curve

Learning Curve: an initial period of poor performance that decreases over time with experience.

- Needlestick injuries increased ‘during a procedure’ following the implementation of SENs before declining.

Negative feedback, resistance to the transition, and activation problems were often discussed in **retrospect**.

In all three cases, there was a shared belief that issues with SENs had either been resolved or staff had learned to adapt...



Implementation Facilitators

What helped organizations overcome implementation challenges?

- **External resources**
 - Product vendors
- **Organizational readiness for change**
 - Timing of the transition
 - Management support
- **Implementation policies and practices**
 - Communication
 - Ongoing monitoring
- **Implementation climate**
 - OHS management system
 - Implementation champion(s)



Ongoing Integration Efforts

Implementation Effectiveness: When new learning is integrated into practices, policies and procedures. The implemented program is fully operational and the innovation is “accepted practice” – There is consistent and quality use of an innovation

Is there a need for ongoing focus on needlestick injury prevention?

- Ongoing needlestick injuries
- Exceptions
- Product improvement
- Practice issues

Ongoing activities appeared to be more reactive in nature



**Institute
for Work &
Health**

Research Excellence
Advancing Employee
Health

What might challenge further progress to advance needlestick injury prevention?



Change Commitment

Do organizational members perceive the change to be needed, beneficial or worthwhile?

- Apprehension about the value of future investments to promote consistent and quality use of SENs and the need to enhance the current stock of safety devices.
- Front-line workers were not always aware that injuries were continuing to occur
- There were different perspectives over whether this mattered and what should be done about it



Change Commitment

Regarding the move to passive safety devices...

The belief that ongoing injury risk is largely due to individual practice

“at the end of the day the issue isn’t what the hospital has, the issue is how staff uses it”

The importance of staff compliance and “being more careful”

- Importance of taking control over the situation
- Not rushing through a procedure

Sense that staff are “content” with the current stock of safety needles

“I do think that staff are quite happy with their safety engineered devices, I am not saying that, that they wouldn’t be happier if they have had their retractable, I would certainly think in certain cases it would be, it would be better, but I do think that, what we’ve got is certainly helping...”



Readiness for further change

There were however, alternative views expressed...

- All front-line workers who participated in an interviews and recently reported a needlestick injury expressed support for the use of passive SENs providing detailed accounts of how their injury experience could have been prevented had a passive safety needle been available.

“I got one needlestick injury since I’ve been here and it happened so fast..as I was going over with [occupational health], I thought I did almost everything right... I think the best thing that I am always for is to have one of those retractions, like the IV one we have, it goes in and then locks by itself, you don’t have to take it out before you activate.”



Change Efficacy

Do organizational members perceive future change as feasible?

There were a number of conditions and perceptions shared by front-line staff and organizational informants that revealed influences on the appraisal of the capacity for further change.

- Other OHS priorities
- Perceptions of available financial resources

“A retractable would be better it’s a much higher cost and right now everybody is cutting so much that I can’t imagine them bringing anything more in...”



Contextual Influences

- **'Change fatigue'** - an explanation for not investing in further activities to address ongoing needlestick injuries:

“Hospitals are going through so much change right now universally that people are almost resisting anything, I mean not just making an argument for the sake of arguing but people are fed [up], in the current state just get a little fed up with change so I think that’s confounding what they really feel about the product or its safety. If it’s something different it’s a change and they don’t want it.”

- Change fatigue has been studied in the organization change literature and recently discussed in relation to nursing practice but has yet to be integrated to study implementation (McMillan & Perron, 2013; Hansson et al., 2008)



Summary

- Injury trends in Ontario demonstrate needlesticks have not declined substantially
- All 3 hospitals under study responded with integrity, there was evidence of inconsistent implementation and outcomes
- During the initial implementation phase some front-line workers developed strategies to avoid using the SENs. There was a conflict between values healthcare workers placed on performance and patient care and the learning curve associated with the initial transition
- Ongoing activities to address needlestick injuries were described as reactive in nature, heavily reliant on injury data
- What might challenge further progress in needlestick injury prevention:
 - Lack of awareness ongoing risk
 - Different views re how to address ongoing risk
 - Whether additional investments would be worthwhile
 - Variation in perceptions as to what should be changed
 - Progress reliant on financial constraints, other priorities



Implications

Needlestick Injury Prevention

- Increase awareness regarding ongoing injury risk
- Root cause analysis to identify what measures can be taken to reduce injury risk
- Enhance surveillance efforts at systems level
- Enhancing safer needle technology

Research

- Role of professional values, workload demands and change fatigue on implementation of OHS interventions
- Efficacy of passive SENs



Thank You!

Acknowledgement:

CIHR Frederick Banting & Charles Best Canada Graduate Scholarship

Please contact me for further information

E-mail: **achambers@iwh.on.ca**

Andrea Chambers



References

Alliance for Sharps Safety and Needlestick Prevention. Letter to Premier and Ministers of Health and Labour. Ontario Public Service Employee Union 2007; Available from:

<http://www.opseu.org/campaign/saferneedles/AllianceOc07LetterPremier.pdf>

Hansson A, Vingard E, Arnetz BB, Anderzen I. Organizational change, health, and sick leave among health care employees: A longitudinal study measuring stress makers, individual, and work site factors. *Work and Stress* 2008;21(1):69-80.

Lee JM, Boteman MF, Zanthakos N, Nicklasson L. Needlestick injuries in the United States: Epidemiologic, economic and quality of life issues. *AAOHN Journal* 2005;53(3):117-34.

McMillan K, Perron A. Nurses amidst change: The concept of change fatigue offers an alternative perspective on organizational change. *Policy, Politics and Nursing Practice* 2013;14(1):26-32.

Tosini W, Ciotti C, Goyer F, Lolom I, L'Hériveau F, Abiteboul D, et al. Needlestick injury rates according to different types of safety-engineered devices: Results of a French multicenter study. *Infection Control and Hospital Epidemiology* 2010;31(4):402-7.

WorkSafeBC. Regulation change: Safety engineered needles/sharps. 2010 Available from: http://www.worksafebc.com/regulation_and_policy/policy_practice_consultative_committee/assets/pdfs/effectivenessmeasurereportsQ410.pdf



**Institute
for Work &
Health**

Research Excellence
Advancing Employee
Health

www.iwh.on.ca