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A Theory-Based Knowledge Translation Intervention to Improve Physician Hand Hygiene Practice




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Presentation Objectives

1. To present an overview of the process used to develop a theory-based knowledge translation intervention to improve physician hand hygiene practice
2. To present findings on the barriers and enablers to physician hand hygiene practice
3. To present a description of the knowledge translation intervention
4. To present findings from the pilot-test and process evaluation of the knowledge translation intervention


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Acknowledgements

The Team


- Janet Squires (KT Scientist, OHRI, Co-PI)
- Kathryn Suh (Director, Infectious Prevention and Control, TOH, Co-PI)
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Background

- Healthcare-associated infections (HAIs) are 1 of the top 10 causes of hospital deaths worldwide
- In Canada, HAIs:
 - affect 10% of ALL patients in acute-care hospitals
 - are the 4th leading cause of death
- **Hand hygiene (HH) is the single most successful and cost-effective means of preventing HAIs**
 - Pathogens are transmitted through direct and indirect contact, droplets, air, and **contaminated hands of healthcare workers**
 - Microorganisms survive on hands for up to 60 minutes after contact
- **BUT** HH compliance among healthcare workers, especially physicians, is consistently suboptimal

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Background

- Physician HH compliance is a problem internationally
 - Average compliance rate: 49-57%
- Compliance at The Ottawa Hospital
 - Corporate goal: 80%
 - Pre study independent audit - average rate 56% on study units (n=4 units; 2 medicine and 2 surgery units)
- Common interventions (with little success): substitutions of products & different multifaceted campaigns (Gould 2007 CDSR)
- Reasons for poor compliance are not well understood
- Physician-specific barriers in literature are limited
 - Physicians' belief that their compliance is better than it is
 - Development of a more cavalier attitude towards infection control with experience, with an associated drop in compliance
 - Lack of positive physician role models for HH


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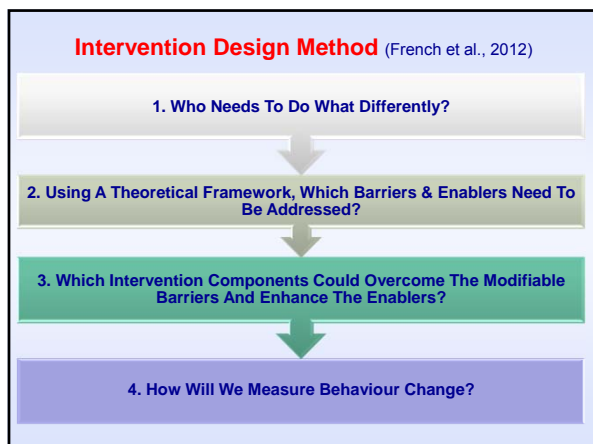
Purpose and Objectives

Study Purpose
 To design and pilot test a theory-based KT intervention to improve physician hand hygiene compliance

Study Objectives

1. To identify the barriers and enablers to best hand hygiene practice by physicians
2. To develop and pilot test a theory-based knowledge translation intervention focused on improving hand hygiene compliance by physicians that is based on the identified barriers and enablers

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1. Who Needs To Do What Differently?

- 1. What is the clinical behavior we will try to change?**
 - Compliance with best HH practice (soap/water or gel)
 - Interest was predominantly the act rather than technique of HH
- 2. Who performs the behavior(s)?**
 - Physicians and physician trainees. In this study we decided to focus equally on staff physicians and residents
- 3. When and where do they perform the behavior(s)?**
 - There are four moments for hand hygiene practice
 1. **Before initial patient/patient environment contact**
 2. Before aseptic procedure
 3. After body fluid exposure risk
 4. **After patient/patient environment contact**

Physicians need to increase proper hand hygiene compliance

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2. Using A Theoretical Framework, Which Barriers & Enablers Need To Be Addressed?

Data Sources to Determine the Barriers and Enablers

- 1. Key informant interviews (N=42)**
 - Physicians and residents from medicine and surgery units
 - Semi-structured interviews using a guide informed by the *Theoretical Domains Framework (TDF)*
- 2. Focus groups with HH experts**
 - 2 FGs with experts
 - Participants included: hand hygiene auditors, infection control specialists, and members of senior management
 - FG also guided by the *TDF*
- 3. Observation of HH audits**
 - On non-study medicine & surgery units

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The Theoretical Domains Framework (TDF)

- **Version 2 of the TDF used to inform the interview guides**
- **The TDF**
 - Developed using a systematic consensus approach
 - 14 'theoretical domains' from 128 constructs from 33 health and social psychology theories
 - The domains offer wide coverage of the potential multi-level determinants of health-related behavior
 - Has been used in many studies to identify barriers and enablers to a variety of professional behaviors

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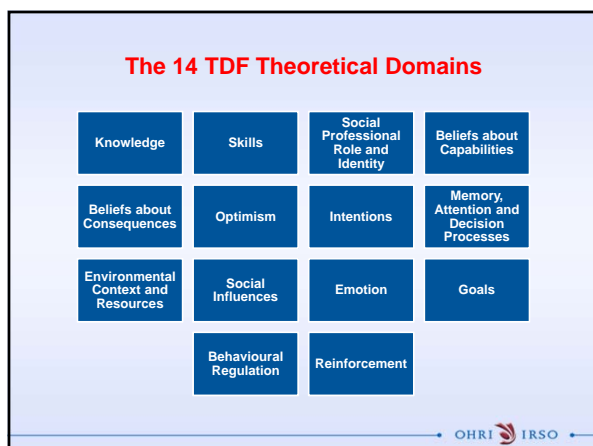


Table 2 Domains in the theoretical domains framework

Theoretical Domain	Definition (44)
Knowledge	An awareness of the existence of something
Skills	An ability or proficiency acquired through practice
Social/Professional Role and Identity	A coherent set of behaviours and displayed personal qualities of an individual in a social or work setting
Beliefs about capabilities	Acceptance of the truth, reality or validity about an ability, talent or faculty that a person can put to constructive use
Optimism	The confidence that things will happen for the best or that desired goals will be attained
Beliefs about consequences	Acceptance of the truth, reality or validity about outcomes of a behaviour in a given situation
Reinforcement	Increasing the probability of a response by arranging a dependent relationship, or contingency, between the response and a given stimulus
Intentions	A conscious decision to perform a behaviour or a resolve to act in a certain way
Goals	Mental representations of outcomes or end states that an individual wants to achieve
Memory, attention and decision processes	The ability to retain information, focus selectively on aspects of the environment and choose between two or more alternatives
Environmental context and resources	Any circumstance of a person's situation or environment that discourages or encourages the development of skills and abilities, independence, social competence, and adaptive behaviour
Social influences	Those interpersonal processes that can cause individuals to change their thoughts, feelings or behaviours
Emotion	A complex reaction pattern, involving experiential, behavioural and physiological elements, by which the individual attempts to deal with a personally significant matter or event
Behavioural regulation	Anything aimed at managing or changing objectively observed or measured actions

The TDF Interview Guide Sample Questions

Social Professional Role and Identity	• Is hand hygiene a standard part of your patient consultations?
Social Influences	• Do other team members influence your decision to practice hand hygiene?
Beliefs about Consequences	• What are the negative aspects when hand hygiene is practiced?
Emotion	• Does your emotion or mood ever influence whether you practice hand hygiene?
Beliefs about Capabilities	• How easy or difficult is it for you to practice hand hygiene?

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Procedure for Collecting and Analyzing Key Informant and FG Data

1. Interviews conducted and transcribed
2. Coding Scheme based on consensus coding of 2 interviews
3. Utterances coded into TDF domains independently by 2 coders
4. Consensus on coding for each interview
5. Belief statements developed for codes in each domain
6. Consensus on belief statements reached
7. Determine 'important' TDF domains to physician HH compliance (involves clinician participation)

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Belief Statements

- Similar codes are grouped within domains to generate specific belief statements
- A specific belief refers to a collection of responses with a similar underlying theme that suggests a problem and/or influence of the belief on the target behaviour (HH)
- Statements describing specific underlying beliefs are generated within each domain by one team member, which is double-checked by a second team member
- Belief statements become the focus in designing the intervention to change the target behaviour
 - Belief statement – I do not know the HH guidelines (Knowledge)
 - Part of the intervention was to inform physicians on what the guidelines are

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Domain	Quote	Belief
Knowledge	• "I'm sure there must be some but have I read a guideline on hand hygiene, no"	• I do not know the hand hygiene guidelines
Beliefs about Consequences	• "I think it [hand hygiene] definitely contributes but I don't think it is the most important factor in a lot of the infection that we see in the hospital"	• While improper hand hygiene can contribute to infection, it is not the only factor that can do so
Memory, Attention, and Decision Processes	• "... I need reminders, as a human I tend to forget from time to time and if I have a reminder in the hospital I do it"	• Reminders are useful for my hand hygiene practice
Skills	• "I think the more I do it the more I tend to remember and it is becoming more of an automatic."	• With repetition, hand hygiene practice becomes automatic

Results: Barriers Assessment

- Interviews with 42 Key informants
 - Medicine Staff Physicians (n=11)
 - Surgery Staff Physicians (n=11)
 - Medicine Residents (n=10)
 - Surgery Residents (n=10)
 - Divided equally across 2 hospital campuses
- Interviews found similar themes in all TDF domains across the 4 groups
 - Findings reinforced in observation and focus groups
- Not all domains were important to physician HH practice

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Sample Belief Statements by Domain

Knowledge

- I am (not) aware of HH guidelines and have (not) heard of the 4 moments of HH
- I am (not) aware of evidence linking HH to HAIs
- Education about HH ensures that I practice it consistently

Beliefs About Consequences

- Practicing HH reduces the transmission of infection
- While improper HH can contribute to infection, it is not the only factor that can do so
- Practicing HH gives patients confidence in their physician

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Sample Belief Statements by Domain

Beliefs About Capabilities

- HH is easy to practice
- I am not confident that I am following HH guidelines when practicing HH

Skills

- I do (not) consider HH a skill
- I have (not) had training in HH practice
- With repetition, HH practice becomes automatic

Environment

- Easy access to HH stations makes it easier to practice HH
- The location of HH stations is important in facilitating HH practice
- When I am busy, I am less likely to comply with HH guidelines

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Domain	Belief Statements	Merged Belief Statement
Environmental context and resources	<ul style="list-style-type: none"> • Practicing HH takes time • When time is a limited resource, I am less likely to comply with HH guidelines • There are competing tasks or time constraints influencing my HH practice 	Practicing HH takes time
Memory, attention and decision processes	<ul style="list-style-type: none"> • Easily visible HH stations make it easier to remember to practice HH • ABHR stations serve as a good reminder to practice HH • Easy access to ABHR makes it easier to remember to practice HH • ABHR stations at each door reminds me to practice HH • HH stations next to patients rooms make it easier to remember to practice HH • ABHR next to my gloves is a trigger to remember to practice HH • HH resources are triggers for me to practice HH 	Easily visible HH stations make it easier to remember to practice HH

Determining the Important TDF Domains to Focus our Intervention on

Criteria	Details	Who Responsible
1	Relatively high frequency of specific beliefs	KT Researchers
2	Presence of conflicting beliefs	KT Researchers
3	Evidence of strong beliefs that may impact on the behavior	Clinicians

9/14 TDF domains were identified as important and taken into Step 3 of the French Framework – Which Intervention Components Could Overcome The Modifiable Barriers And Enhance The Enablers?

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Important / Not Important TDF Domains

Domains that are important to this behaviour (in this study)

1. Knowledge
2. Skills
3. Social Professional Role and Identity
4. Beliefs about Capabilities
5. Beliefs about Consequences
6. Memory , Attention and Decision Processes
7. Environmental Context and Resources
8. Social Influences
9. Goals

Domains NOT important to this behaviour (in this study)

1. Optimism
2. Intentions
3. Emotions
4. Reinforcement
5. Behavioural Regulation

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Examples of Important Belief Statements

Domain	Belief Statement	N (%)
Knowledge	I am aware of and agree with evidence linking HH to HAIs	27 (64)
	I am not aware of evidence linking HH to HAIs	9 (21)
Skills	I consider HH a skill	26 (62)
Social Prof.	HH is not specific to my specialty	14 (33)
Beliefs Capabilities	I am confident that I am following hand HH guidelines when practicing HH	20 (48)
Beliefs Con	It is very likely that improper HH will lead to a HAI	13 (31)
Memory	Practicing HH is a conscious decision/is not an automatic process for me	25 (60)
Context	Easy access to HH stations makes it easier to practice HH	41 (98)
Social Influ	Other team members influence my HH practice	15 (36)
Goals	When taking all priorities into consideration, HH is a:	
	10	12 (29)
	8-9	23 (55)
	≤7	4 (10)

3. Which Intervention Components Could Overcome The Modifiable Barriers and Enhance The Enablers?

Conducted in 3 Phases

1. Intervention Mapping using Michie BCT Matrix (to identify effective BCTs for the important domains)
2. Full team meeting to prioritize domains and design content of the intervention
3. * Individual clinician meetings to discuss delivery of the intervention

Step 3-1 - Intervention Mapping using Michie BCT

From Theory to Intervention: Mapping Theoretically Derived Behavioural Determinants to Behaviour Change Techniques

Susan Michie*
University College London, UK

Data from Consensus Process for Linking Behaviour Change Techniques with Determinants of Behaviour

Technique for behaviour change	Techniques judged to be effective in changing each construct domain										
	1	2	3	4	5	6	7	8	9	10	11
Goal/target specified: behaviour or outcome											
Monitoring											
Self-monitoring											
Contract											
Rewards, incentives (inc. self-evaluation)											
Graded task, starting with easy tasks											
Increasing skills: problem solving, decision-making, goal-setting											
Stress management											
Coping skills											
Rehearsal of relevant skills											

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Sample Mapping Brought to Team Meeting

Domain	Belief Statements	Accepted BCTs
Social Influence	<ul style="list-style-type: none"> If I see someone practicing HH, it influences me to do the same Team culture influences others HH practice 	Social processes of encouragement, pressure, support Modeling/demonstration of behaviour by others
Social Professional Role & Identity	<ul style="list-style-type: none"> My HH practice is in line with my peers It is my job to be a HH role model to the members of my team 	Social processes of encouragement, pressure, support
Knowledge	<ul style="list-style-type: none"> I am not aware of evidence linking HH to HAIs I do not know the HH guidelines 	Information regarding behaviour, outcome

Step 3-2 – Full Team Meeting

- Important TDF domains from Step 2 (barriers identification) were **prioritized** (with input from team clinician experts) and became focus of the content of the intervention
- BCTs (from mapping, 3-1) and their delivery discussed based on:
 - empirical evidence and expert consensus of the effectiveness of the BCTs (Matrix)
 - what is likely to be feasible in our specific context
 - what is locally relevant and acceptable

Differed for medicine and surgery

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The Intervention - Content

Intervention included 2 'agreed on' BCTs for 5 TDF domains (*chose BCTs that address multiple domains to reduce complexity)

- BCT 1 – Interactive Session with Education**
 - 8-10 minutes in interactive sessions (over 4 sessions) designed around belief statements targeting 5 domains:
 - Knowledge**
 - I am/am not aware of hand hygiene guidelines and/or the 4 moments of hand hygiene
 - Skills**
 - I have/have not had training in hand hygiene practice
 - I do (not) consider HH a skill

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The Intervention - Content

- Beliefs about Consequences**
 - Practicing HH reduces the transmission of infection
 - While improper HH can contribute to infection, it is not the only factor that can do so
- Memory, attention, & decision processes**
 - Practicing HH is/is not an automatic process for me
 - Reminders are useful for my HH practice
 - Easily visible HH stations make it easier to remember to practice HH
- Social Influences**
 - Other team members do/do not influence my HH practice

BCT 2 - Glogerm Session

- Demonstration and practice of HH followed by light to show areas missed

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The Intervention - Delivery

Medicine

- 2 slides presented at a **resident** orientation session (4 moments)
- Quick (~2 min) interactive sessions provided while Infection Control provided antibiotic stewardship rounds 2x/week at morning team rounds (**residents and staff**)
- Glo Germ demonstration after antibiotic stewardship sessions (**residents and staff**)

Surgery

- 10 minute presentation at a **resident** academic half day (in between sessions 1 and 2) + **Glo Germ demonstration**
 - Material in slides was same as that presented to the Medicine group
- Same presentation given at the quarterly meeting (**staff physicians**) + Glo Germ demonstration

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The GloGerm Demonstration



4. How Will We Measure Behavior Change?

1. Could we deliver the intervention as planned?
2. Did the intervention change practice?
 - Pre and post intervention HH audits
3. Process evaluation
 - Attended the intervention sessions
 - Remembered the content
 - Part of sessions most and least useful
 - Suggestions for future sessions

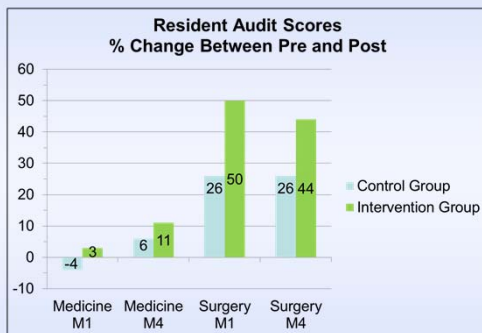
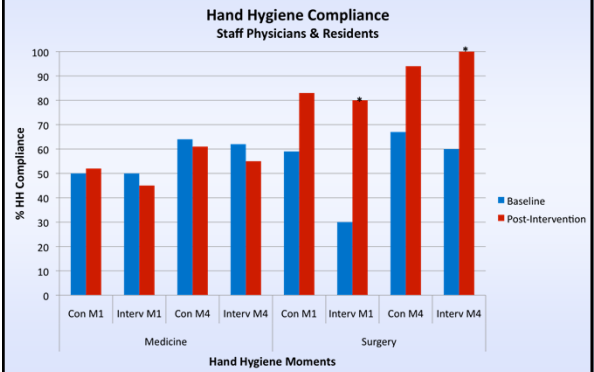
Could We Deliver The Intervention As Planned?

Yes once delivery was sorted out individually with Medicine and Surgery, it progressed as planned

BUT.....there were challenges associated with delivery and measuring the outcome -- the pre and post HH audit

- Delivery re reaching medicine staff physicians
- Residents change rotations monthly and therefore the timeline for obtaining their pre and post audits was tight.
 - This was more of a problem in medicine because of how the intervention was delivered (in weekly antibiotic stewardship rounds)
- Few physician HH opportunities – required being on the floor for long periods to get minimal data (cost)

Did The Intervention Change Practice?



Process Evaluation

- **Medicine: N=13 (3 staff physicians and 10 residents)**
 - 6/10 (60%) attended the residents orientation
 - 5 of 6 (83%) remembered the 2 slides on HH
 - R8/10, S2/3 (77% overall) attended an education session
 - 4 sessions – R4/8, S1/2
 - 3 sessions – R1/8
 - 2 sessions – R2/8, S1/2
 - Don't remember – R1/8
 - R8/10, S2/3 (77% overall) attended a GloGerm Demo
- **Surgery: N= 18 (9 staff physicians and 9 residents)**
 - 6/9 (67%) residents attended the academic half day
 - All 6 (100%) remembered the presentation on HH
 - 5/9 (56%) staff physicians attended the quarterly meeting
 - 4 of the 5 (80%) remembered the presentation on HH

Which Of The Sessions Were/Were Not Useful?

Medicine

"They were fine, we were just really busy that morning and the timing wasn't great" -R9

"Glo Germ session was useful in pointing out areas that are missed while washing hands with alcohol - the presence of an ID physician reminding us to wash our hands was useful, the extra reminder I think helped - it also helped to talk about the statistics of successful hand hygiene" -S4

"Glo Germ session was interesting, especially for beginner medical students." -R6

"Morning rounds were helpful because the information related directly to our patients" -R3

"Glo Germ presentation was useful in demonstrating effective hand washing technique." -R10

"Repeated sessions on hand hygiene - one would have been enough plus the glo germ presentation" -R11

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Suggestions To Improve The HH Sessions?

Medicine

"Would prefer presentation during morning report rather than during team rounding" -R1

"Review common pathogens found on skin Statistics about MRSA, ESBL... what percentage of healthcare workers are carriers? 100% for MRSA? Use illustrations or iPad apps to illustrate why hand hygiene is essential" -S12

"I think the most challenging thing is that we get new residents every four weeks - need to repeat the material often but also find a way to make it interesting and relevant for the trainees who have been through CTU before." -S2

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Which Part(s) Of The Sessions Were Most Useful?

Surgery

Residents

- Pictures/discussion re 4 moments of HH
- Photos of the plate showing bacterial growth with/without alcohol cleanser
- Nice and succinct, to the point
- Reminded of importance

Staff Physicians

- Pictures/discussion re 4 moments of HH
- Feedback on barriers to compliance
- Overall statistics and update

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Which Part(s) Of The Sessions Were Least Useful?

Surgery

Residents

- All useful
- Simply telling us to do it
- Feedback - doesn't seem like our ideas really matter, just a formality to ask

Staff Physicians

- All useful
- Review of 4 moments (already knew)
- Mostly useful
- No aspects

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Suggestions To Improve The HH Sessions?

Surgery

"Agree that UV demonstration on ward is useful." -S8

"Good reminder." -S7

"Increasing the visibility of hand hygiene stations." -R9

"Role playing would make more memorable." -R2

"Some additional info on the science behind it might have provoked increased thought/ action as long as brief." -S5

"Was very informative and interactive." -S3

"More stats would be useful, from TOH/Ontario/Canada about hand hygiene." -R4

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Next Steps

- Clinicians on the team will implement across a larger number of units over a three month period
- KT researchers will study this process and further evaluate effectiveness

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Questions?

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