

How to implement a complex infection control programme?

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“To see far is one thing, going there is another”



Constantin Brancusi, 1876–1957

An Intervention to Decrease Catheter-Related Bloodstream Infections in the ICU

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Bundle:

- Hand hygiene
- Maximal sterile barrier precautions*
- Skin antisepsis with Chlorhexidine
- Avoiding femoral access
- Removing catheter when not needed anymore

*Mask, cap, sterile gown, large sterile drape, sterile gloves
- Targeting catheter-insertion

**Median/1'000
catheter-days**

Table 3. Rates of Catheter-Related Bloodstream Infection at Baseline (before Implementation of the Study Intervention) to 18 Months of Follow-up.*

Study Period	No. of ICUs		No. of Bloodstream Infections per 1000 Catheter-Days				
			Overall	Teaching Hospital	Nonteaching Hospital	<200 Beds ≥200 Beds	
Baseline	55		2.7 (0.6–4.8)	2.7 (0.6–4.8)	0 (0–3.5)	0 (0–5.8)	1.7 (0–4.3)†
During implementation	96		1.6 (0–4.4)†	1.7 (0–4.5)	0 (0–3.5)	0 (0–5.8)	1.7 (0–4.3)†
After implementation							
0–3 mo	96	→	0 (0–3.0)‡	1.3 (0–3.1)†	0 (0–1.6)†	0 (0–2.7)	1.1 (0–3.1)‡
4–6 mo	96	→	0 (0–2.7)‡	1.1 (0–3.6)†	0 (0–0)‡	0 (0–0)†	0 (0–3.2)‡
7–9 mo	95	→	0 (0–2.1)‡	0.8 (0–2.4)‡	0 (0–0)‡	0 (0–0)†	0 (0–2.2)‡
10–12 mo	90	→	0 (0–1.9)‡	0 (0–2.3)‡	0 (0–1.5)‡	0 (0–0)†	0.2 (0–2.3)‡
13–15 mo	85	→	0 (0–1.6)‡	0 (0–2.2)‡	0 (0–0)‡	0 (0–0)†	0 (0–2.2)‡
16–18 mo	70	→	0 (0–2.4)‡	0 (0–2.4)‡	0 (0–0)‡	0 (0–0)†	0 (0–2.4)‡

Mean/1'000 catheter-days: 7.7

Mean/1'000 catheter-days: 1.3

Why did it work?

Prospective, interventional, non-randomised, stepped, four-cluster, 2-year quality improvement project in 223 intensive care units in England – Matching Michigan collaborative

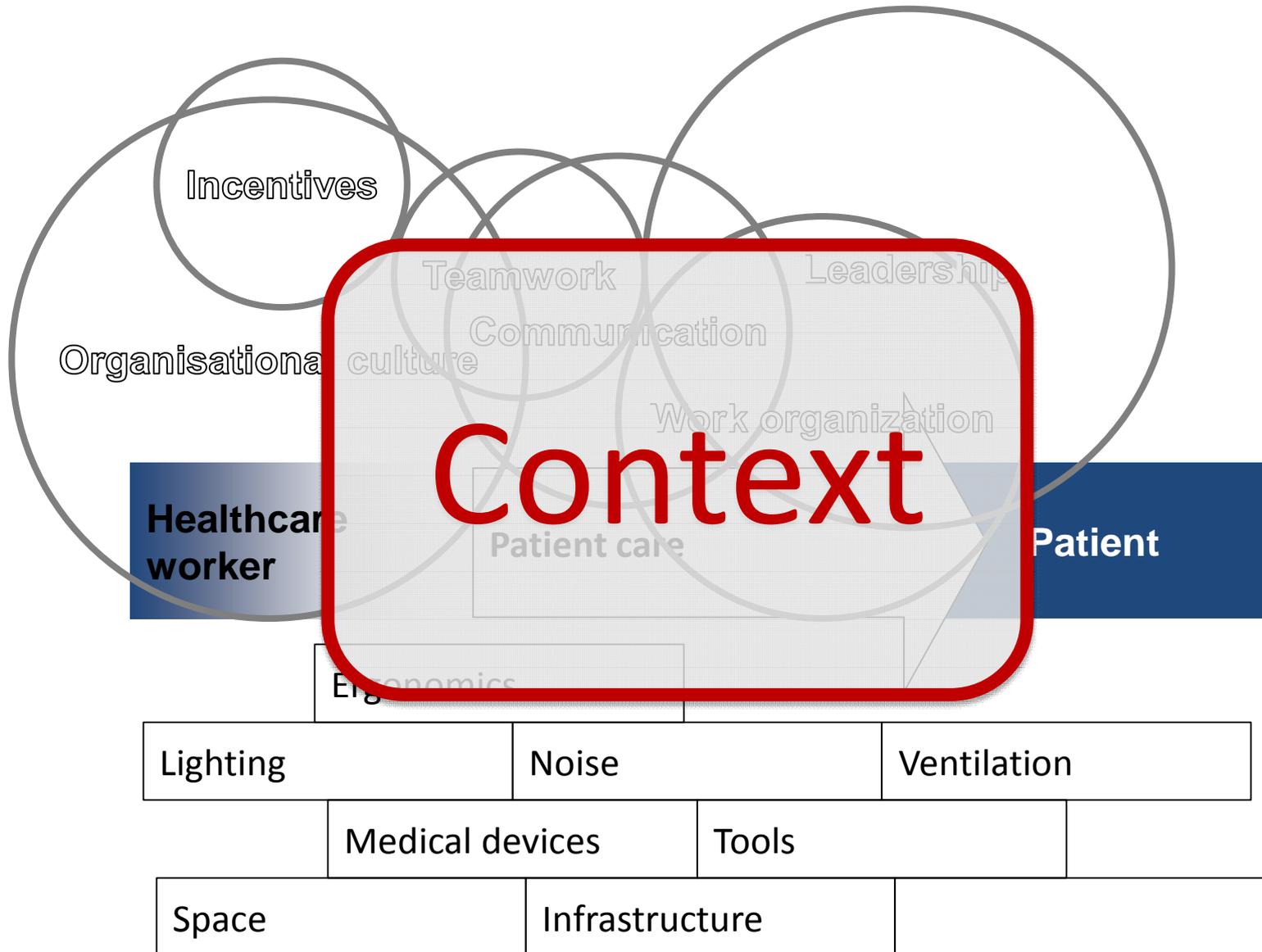
The marked reduction in Catheter-related bloodstream infections found in this study is likely part of a wider **secular trend** for a system-wide improvement in healthcare-associated infections

Explaining Michigan: Developing an Ex Post Theory of a Quality Improvement Program

1. **Generating isomorphic pressures** for ICUs to join the programme and conform to its requirements
2. Creating a densely **networked community** with strong horizontal links that exerted **normative pressures** on members
3. Reframing **CVC-BSIs as a social problem** and addressing it through a professional movement combining “grassroots” features with a vertically integrating program structure
4. Using several interventions that functioned in different ways to **shape a culture of commitment** to doing better in practice (CUSP)
5. Harnessing data on infection rates as a disciplinary force
6. Using “hard edges

We often focus on the “What”
but not on the “How”!

Performance

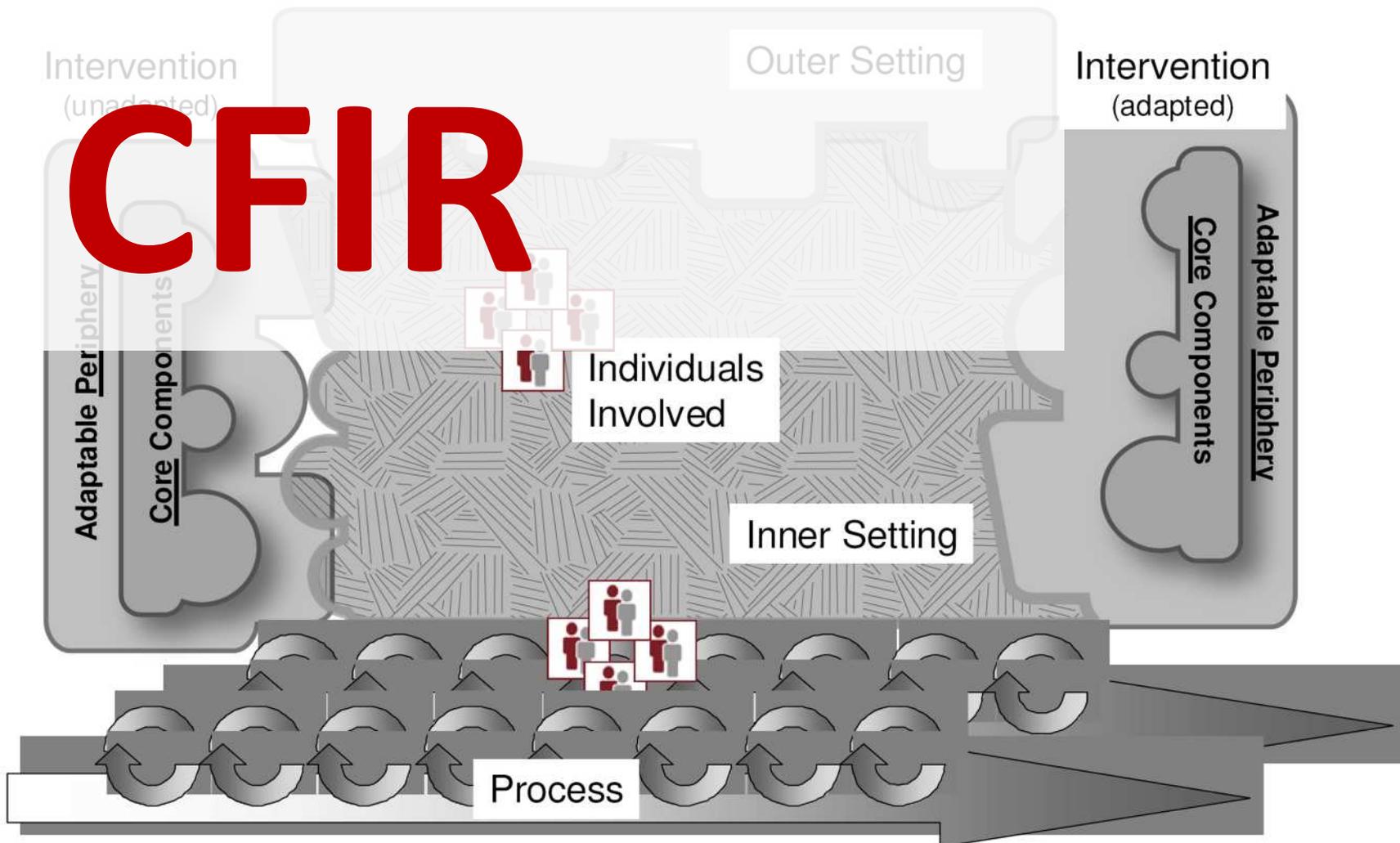


Implementation, by its very nature, is a **social process** that is intertwined with the **context** in which it takes place

Context consists of a **constellation of active interacting variables** and is not just a backdrop for implementation

For implementation research, '**context**' is the set of **circumstances or unique factors** that surround a particular implementation effort

Consolidated Framework for Implementation Research

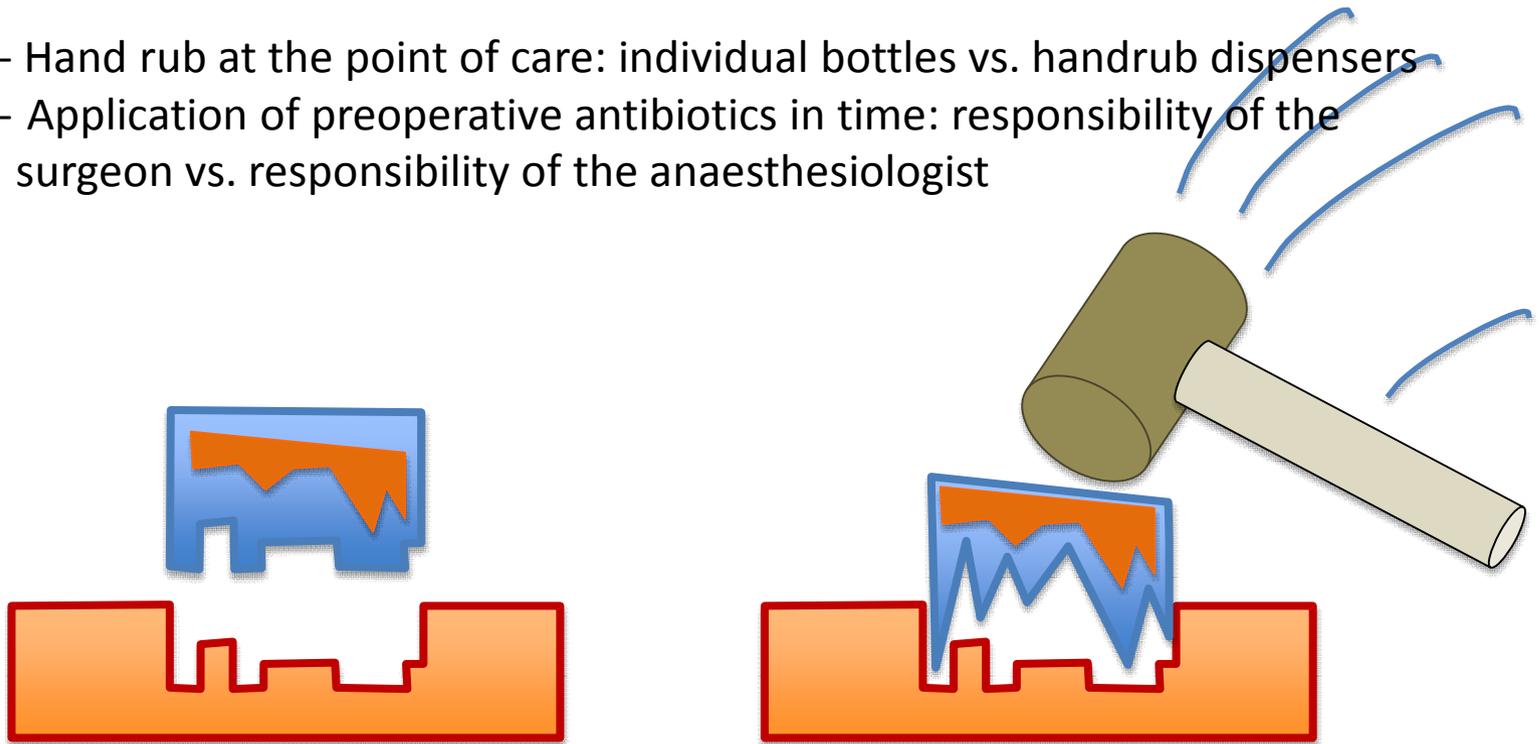


Intervention

Adaptability

Core component – adaptive periphery (One size dose NOT fit all)

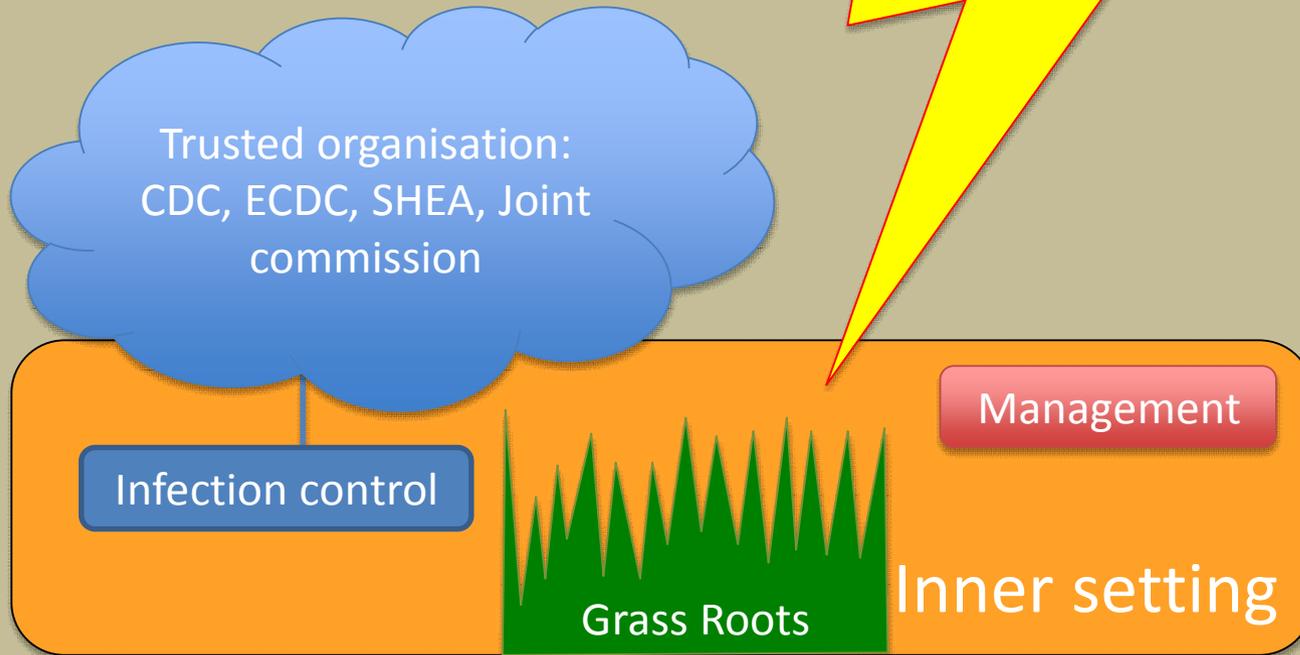
- Hand rub at the point of care: individual bottles vs. handrub dispensers
- Application of preoperative antibiotics in time: responsibility of the surgeon vs. responsibility of the anaesthesiologist



Source of the intervention

Perception of key stakeholders about whether the intervention is externally or internally developed

Outer setting



Relative advantage

Stakeholders' **perception** of the advantage of implementing the intervention versus an alternative solution

If users **perceive** a clear, unambiguous advantage in effectiveness or efficiency of the intervention, it is more likely the implementation will be successful

But: Strong scientific evidence is not a guarantee for “perceived” relative advantage!

Complexity



“**Perceived**” difficulty of implementation

Technical interventions tend to be more visible and **behavioural interventions** tend to be more complex and difficult to implement

Complex behavioural change interventions can work in favour of implementation: If organizations embrace an intervention as a **fundamental change to processes** up front, they are more likely to do what it takes to fully and effectively implement the intervention compared to sites that regard it as a simple “plug-in” intervention

Complex innovations can be broken down into more manageable parts and e.g. implemented sequentially

Pronovost. *New Engl J Med* 2006;355:2725

Bion. *BMJ Qual Saf* 2013;22:110

Timsit. *JAMA* 2009;301:1231

Cost

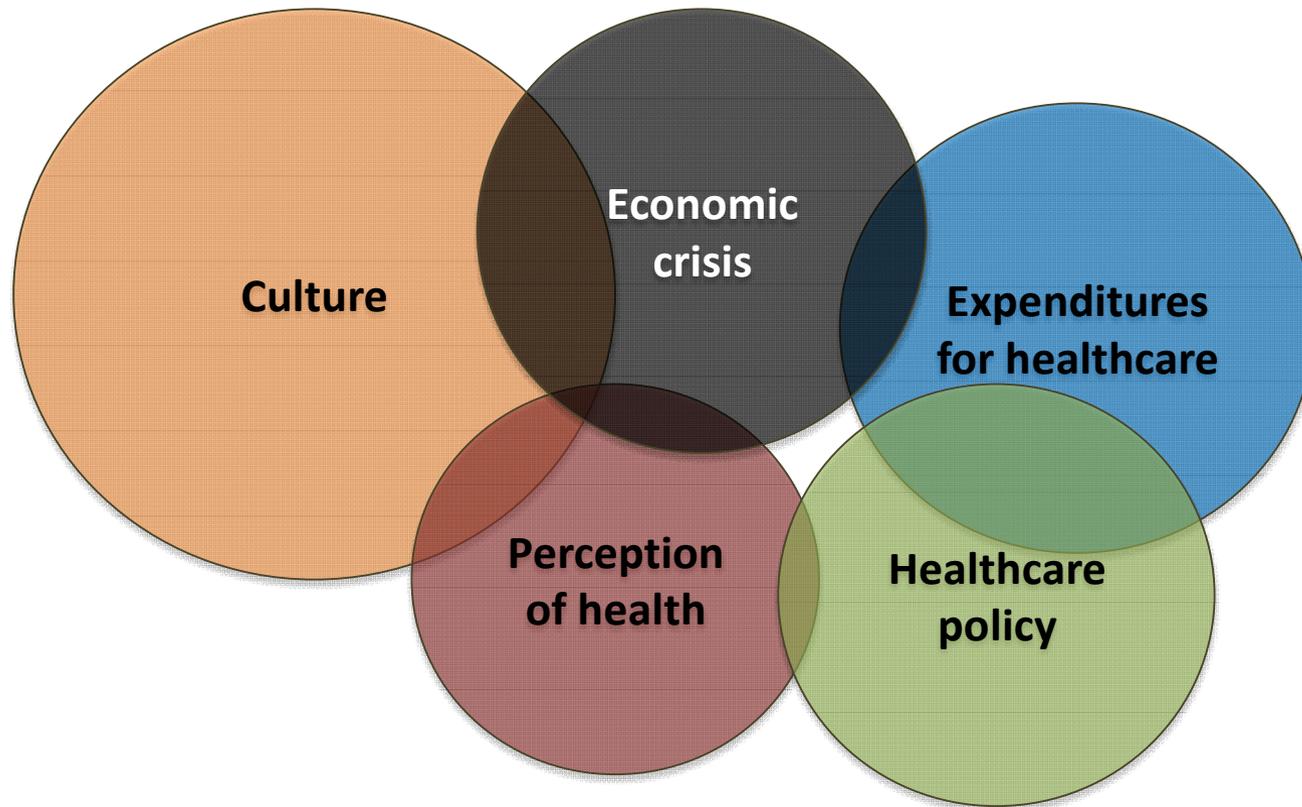
Costs of the intervention and costs associated with implementing that intervention including investment, supply, and opportunity costs

Costs of the intervention and those associated with implementing an intervention are **negatively associated** with implementation

On the other hand: Something that has no cost has no value!

Outer Setting

Economic, political, and social **context**



Cosmopolitanism

The degree to which an organization is (externally) **networked** with other (external) organizations

Organizations that support and promote external boundary- spanning roles are more likely to implement new practices quickly

→ **Use of existing networks**

- Krankenhaus Infektions Surveillance System (Germany)
- International Infection Control Consortium (INICC)

→ **Networks may be created in the context of an implementation**

- Michigan Keystone project
- Switzerland: hand hygiene campaign, SSI-Surveillance

External policies, incentives, directives

A broad construct that includes **external strategies to spread interventions** including **policy** and **regulations** (governmental or other central entity), external mandates, **recommendations** and **guidelines**, pay-for performance, collaboratives, and **public** or benchmark **reporting**

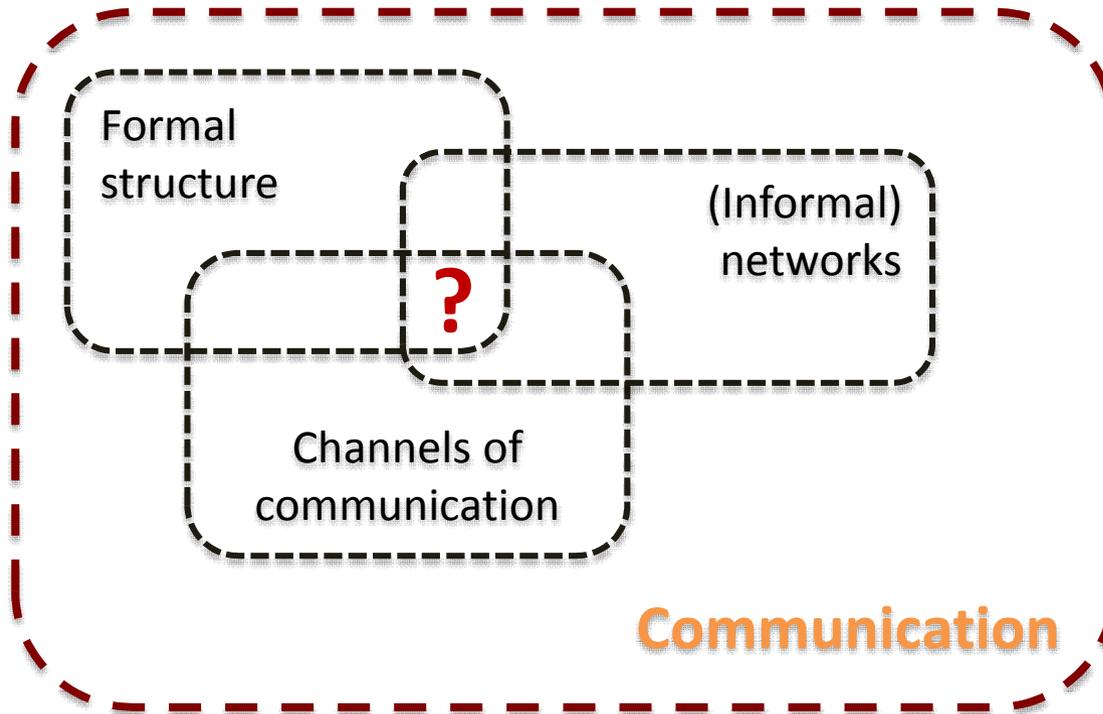
Political directives (Policy 'push') increase motivation, though not capacity, of organizations to implement

Adverse effects of (public) reporting: cover-up, gaming, box-checking rather than true commitment

Inner Setting

Communication

The nature and quality of networks and formal and informal communications within an organisation – Social capital



Organisational culture

Norms, values, and basic assumptions of a given organization
(many definitions exist for culture)

Culture is often viewed as relatively **stable**, socially constructed,
and **subconscious**

Change efforts often target visible, objective, aspects of an organization (work tasks, structures, behaviours) – and fail because they do not address less tangible organizational assumptions, thinking, or culture

Individuals

People are not passive recipients of innovations. Rather...they seek innovations, experiment with them, evaluate them, find (or fail to find) meaning in them, develop feelings (positive or negative) about them, challenge them, worry about them, complain about them, “work around” them, gain experience with them, modify them to fit particular tasks, and try to improve or redesign them – often through dialogue with other users – *Greenhalgh*



Knowledge and beliefs

Self efficacy

Individual identification with the organisation

Positive or negative identification with the organisation interferes with personal commitment and performance – and thus, with the willingness to change behaviour and implement something new



Process

Let it happen

Make it happen

Most approaches have **four** components in common:

- **Planning**
- **Engaging**
- **Executing**
- **Evaluating**

Planning

Planning is a sine-qua-non in the process of implementation

Planning must be clear, detailed, and adapted to the context

Planning takes time!

Engaging

Attracting and involving appropriate individuals in the implementation social marketing, education, role modelling, training, and other similar activities

Having the “right people in the right seats”

Likewise, having the wrong people or missing key opportunities to “engage” important individuals can have a negative influence

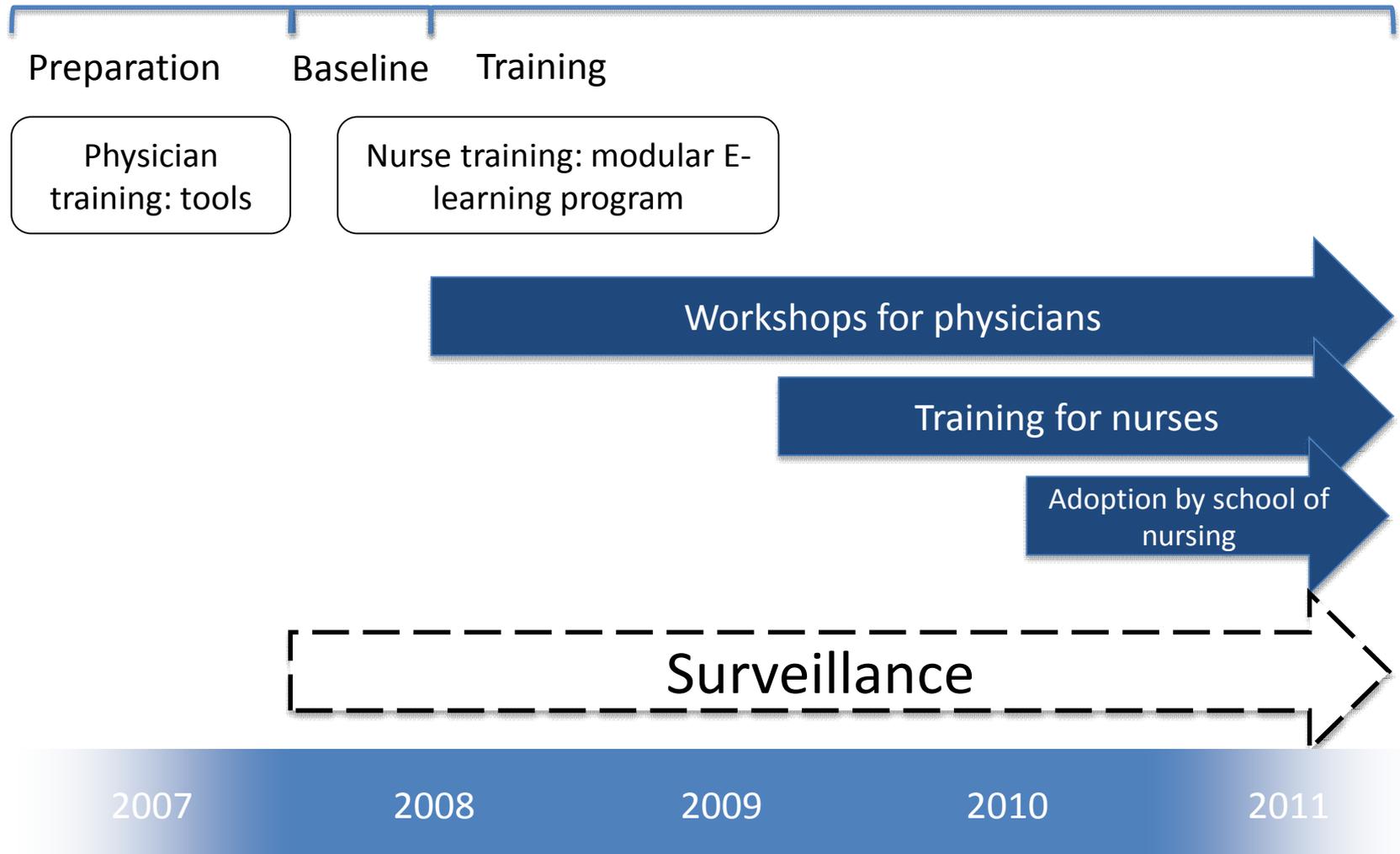
Involving all stakeholders (e.g., leadership, agents, users) early in implementation enhances success

Executing

Three general approaches increase the likelihood of success:

- **Dry runs/simulations**
- **Pilots**
- **Breaking down a complex intervention to manageable parts**

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TRAINING CENTRAL VENOUS CATHETER (CVC)



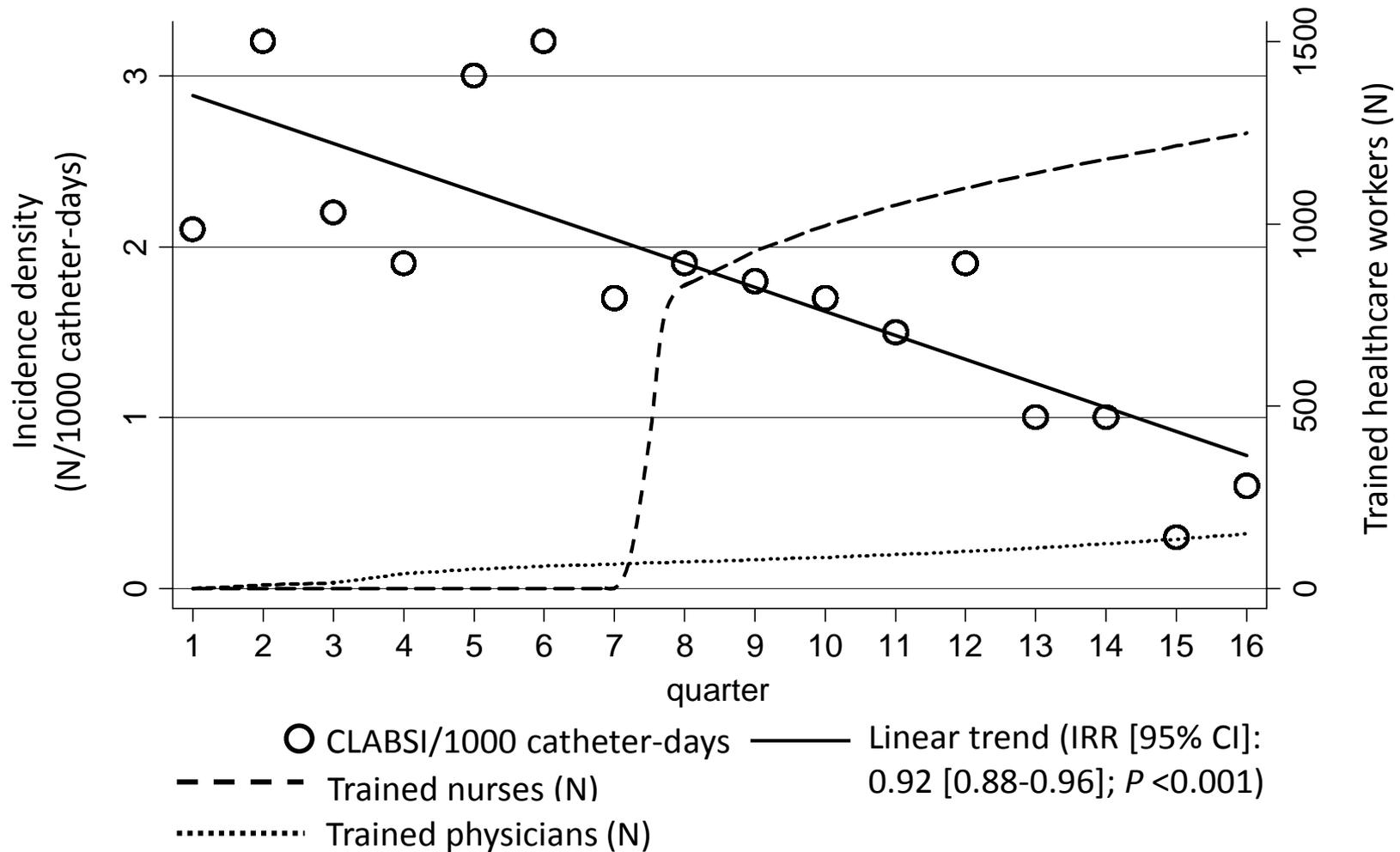
Central Venous Catheter (CVC)

1. CVC INSERTION
2. PREPARATION OF INFUSATES AND CVC MANIPULATIONS
3. DRESSING CHANGE
4. CVC REMOVAL
5. CLINICAL SURVEILLANCE AND DOCUMENTATION

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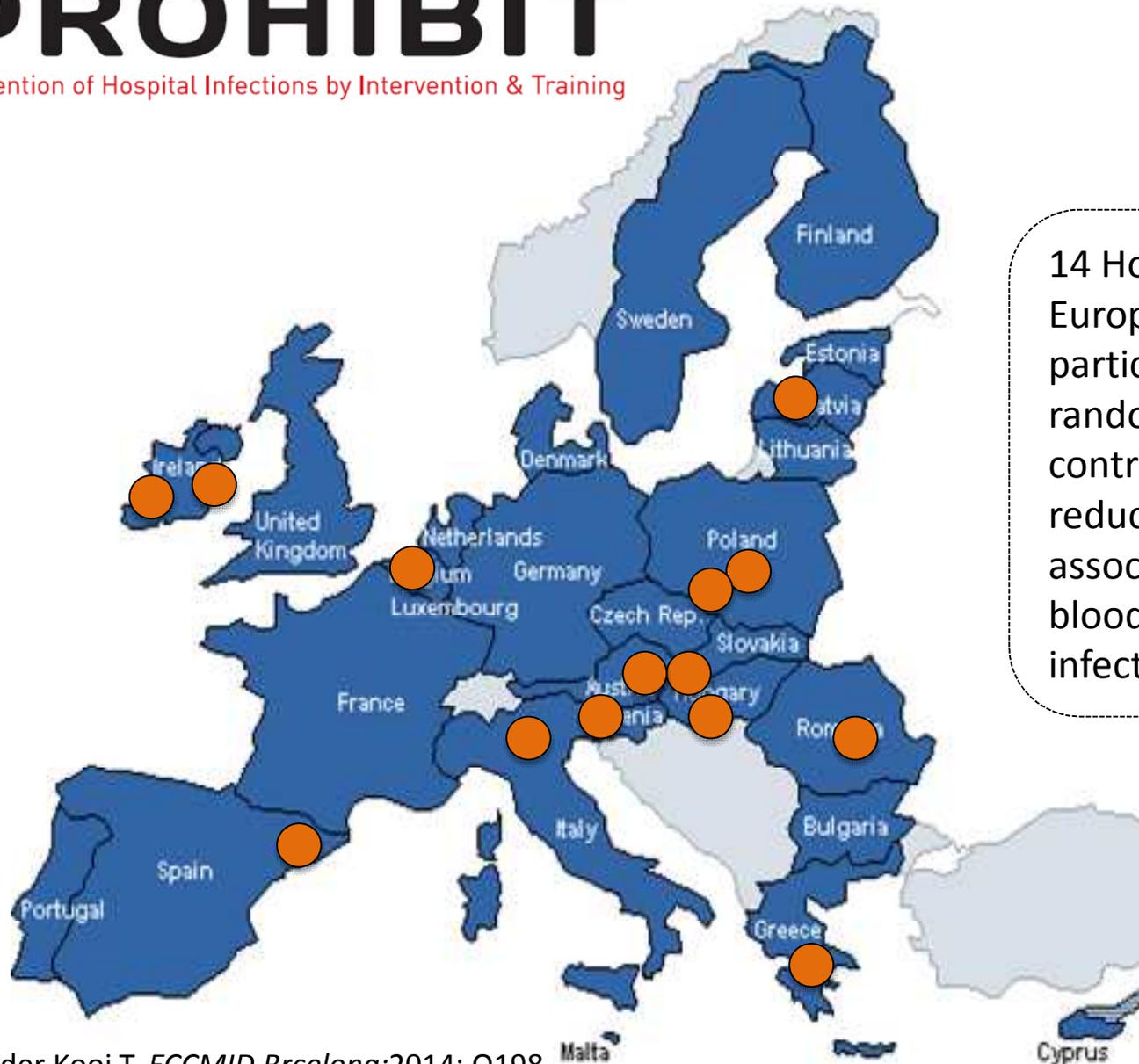
www.carepractice.net

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PROHIBIT

Prevention of Hospital Infections by Intervention & Training



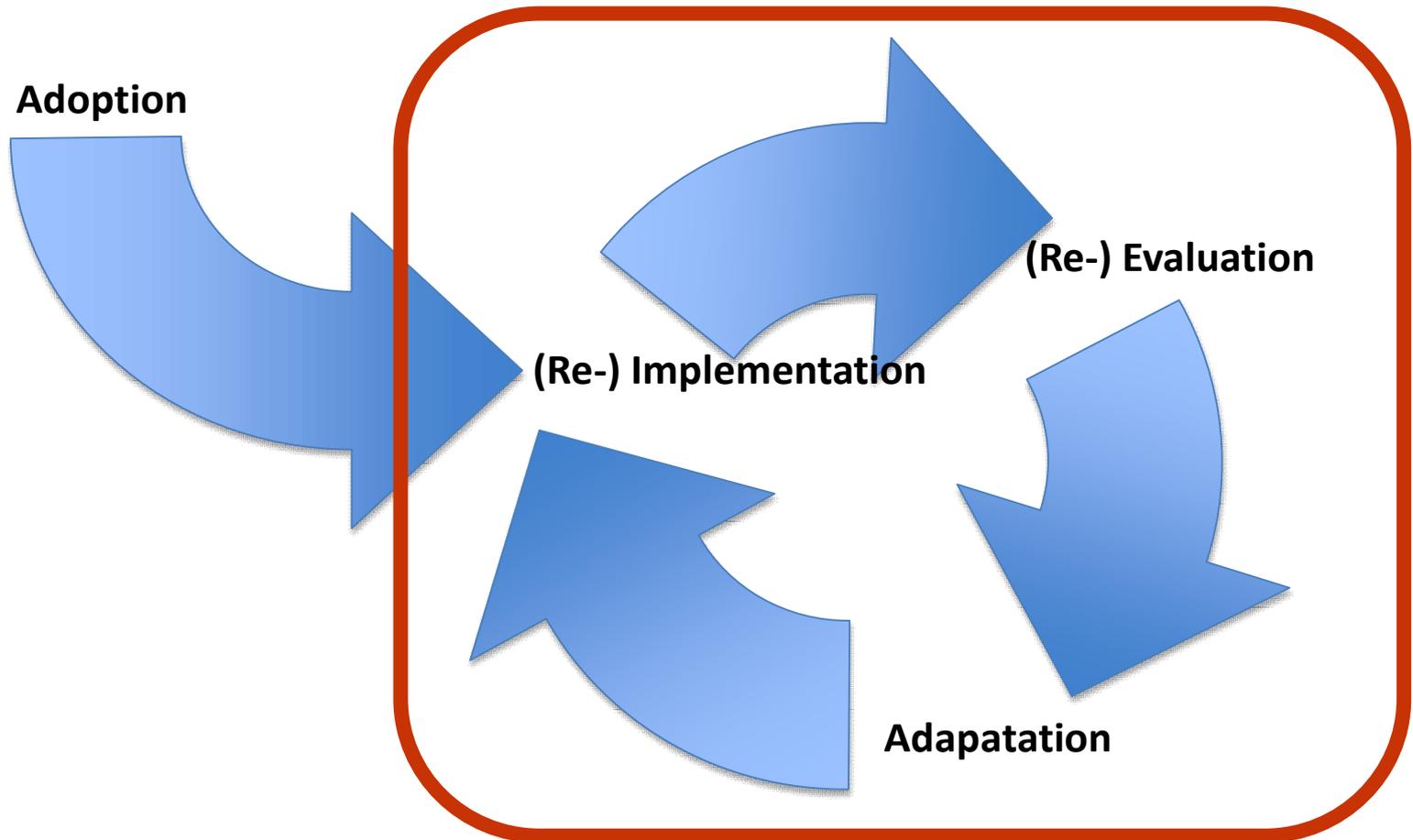
14 Hospitals in the European Union – participating in a randomized controlled trial to reduce catheter-associated bloodstream infections

Summary

The ECDC “SIGHT”-Project

Key components	Indicators
1 An effective infection control programme in an acute care hospital must include at least: one full-time specifically trained IC-nurse ≤ 250 beds; a dedicated physician trained infection control; microbiological support; data management support	<ul style="list-style-type: none"> - Detailed infection control activities: number of ongoing surveillance and prevention programmes, outbreaks, number of performed audits - Established infection control: appropriate staffing, IC committee in place, defined goals for IC, identified IC budget, IC on the agenda of the hospital administration, defined outbreak management, vaccination programmes for health-care workers
2 To make sure that the ward occupancy does not exceed the capacity for which it is designed and staffed; staffing and workload of frontline health-care workers must be adapted to acuity of care; and the number of pool/agency nurses and physicians minimized	<ul style="list-style-type: none"> - Average bed occupancy at midnight - Average staffing of frontline workers - Average proportion of pool/agency professionals
3 <u>Sufficient availability of and easy access to material and equipment and optimized ergonomics</u>	<ul style="list-style-type: none"> - Alcohol-based handrub at the point of care - Sinks stocked with soap and single-use towels
4 <u>Use of guidelines in combination with practical education and training</u>	<ul style="list-style-type: none"> - Guidelines locally adapted - Number of new staff trained using the local guidelines - Teaching programmes are based on local guidelines
5 <u>Education and training involves frontline staff, and is team- and task-oriented</u>	<ul style="list-style-type: none"> - Audit of education and training programmes - Results of knowledge tests and competency assessments
6 Organizing audits as a standardized (scored) and systematic review of practice with timely feedback	<ul style="list-style-type: none"> - Number of audits (overall, and stratified by departments/units and topics) for specified time period
7 Participating in prospective <u>surveillance</u> and offering active feedback, preferably as part of a <u>network</u>	<ul style="list-style-type: none"> - Participation of (inter-) national surveillance initiatives - Number and type of wards with a surveillance - Regular review of the feedback strategy
8 Implementing infection control programmes follow a <u>multimodal strategy</u> including tools such as bundles and checklists developed by <u>multidisciplinary teams</u> and taking into account local conditions	<ul style="list-style-type: none"> - Verification that established prevention programmes follow a multimodal strategy - Process indicators: hand hygiene compliance, compliance with medical/care procedures by checklists, compliance with cleaning/disinfection procedures - Outcome indicators: standardized rates for HAI, infections with MDROs, transmission of MDROs
9 Identifying and <u>engaging champions</u> in the promotion of a multimodal intervention strategy	<ul style="list-style-type: none"> - Interviews with frontline staff and infection control professionals
10 A <u>positive organizational culture</u> by fostering working relationships and communication across units and staff groups	<ul style="list-style-type: none"> - Questionnaires about work satisfaction - Crisis management - Human resource indicators: absenteeism, health-care worker turnover

Implementation – Evaluation – Adaptation



Sustainability

→ iterative process

Who are the hospital's stakeholders?

Pharmacists
Father
Grandfather
CEO of the hospital
Children
Body of quality assurance
Patients
Cleaners
Internists
Grandmother
You
Newborn
Oncologists
Nurses
Physicians
Mother
Surgeons
Aides
Pharmaceutical industry
Tax payer
Grand grandfather
Communities
Me
Universities
Prime minister
Patient advocacy groups
Microbiologists
Politicians
Mayor
Health authorities

Scientific committee

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Date28th – 29th November 2013**Venue**University Hospitals of Geneva,
Rue Gabrielle-Perret-Gentil 4, 1211 Geneva, Switzerland**Target group**Hospital administrators, physicians and nurses with an interest in
infection control**Registration fee**Medical doctors/Managers: CHF 520.00
Nursing staff: CHF 400.00**The course fee includes**

Lunches, refreshments, dinner, material and certification

ArrivalFrom the airport Cornavin: Bus No.5 to "Hôpital"
From the train station Cornavin: Bus No.1 or Bus No.5 to "Hôpital"
There are counters in the baggage claim area of the airport where
free city tickets can be obtained.**Course language**

English

Accreditation

SSI/SGInf: 9 credits

Confirmation of participationFollowing receipt of your registration you will receive the
registration confirmation and invoice.
The participation fee is due at the latest two weeks prior to
the start of the course.**Conditions of withdrawal**Cancellations must be carried out in writing. Upon withdrawal up
to 4 weeks prior to the start of the course, participation fees are
refunded to 100%; up to 7 days before the start of the course,
50% of participation fees will be refunded. For later cancellations
or absences from the course the full participation fees will be
charged.

The general business conditions of B. Braun Medical AG pertain.

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22nd – 23rd September 2014

Geneva, Switzerland



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Thank you

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