Root cause analysis to support IC teams daily work

Dr Anne-Gaëlle Venier, MD, PhD
Cpias Nouvelle-Aquitaine
Bordeaux, France

@AgVenier
anne-gaelle,venier@chu-bordeaux,fr

Hosted by Jim Gauthier
Senior Clinical Advisor Infection Control
Diversey

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WHO RCA definition

- Systematic analysis of all the factors which (…) have the potential to prevent an error
- Can be applied to incidents or to 'near misses'
- Explains how the incident occurred
- Designs mechanisms to prevent the incident from happening again

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KEY POINTS

An error is something realised only after the event

Slips and lapses are errors of action and memory

Mistakes are errors of knowledge and planning

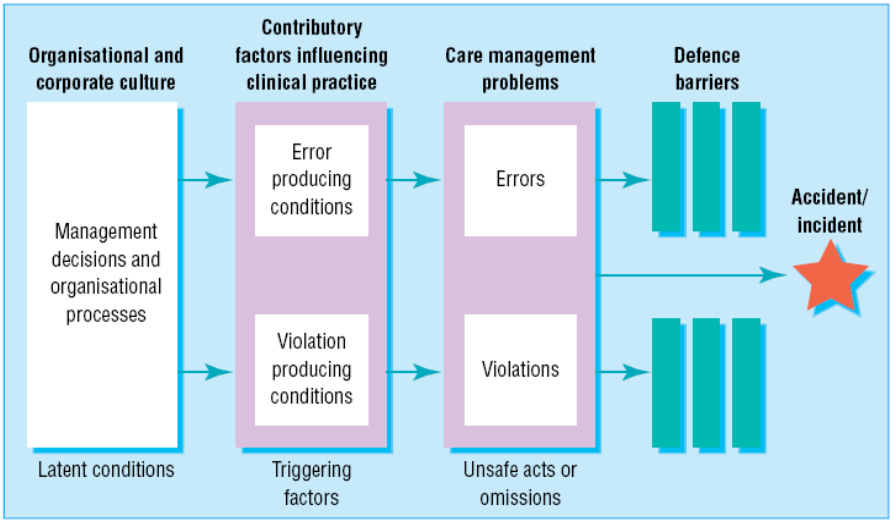
Errors can only be properly understood in context

Patient, task, individual, team, environment, organisational and institutional context factors may all influence incidents and accidents

Incidents may act as a 'window' on the healthcare system

http://www.chfg.org/wp-content/uploads/2012/03/Vincent-Essentials-of-Patient-Safety-2012.pdf 3

Root cause analysis



Model of organisational causes of accidents (adapted from Reason[9])

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http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1117773/pdf/777.pdf

RCA basics

What has arrived? — Time line / Chronology

How it has arrived? — Gaps / Immediate causes

Why it has arrived ? — Root - latent causes

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RCA basics

Prevention phase (before the event)

Attenuation phase (after the event)

What has arrived? — Time line / Chronology

How it has arrived? — Gaps / Immediate causes

Why it has arrived ? — Root - latent causes

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Root Cause Analysis

Patient factors
Clinical condition
Physical factors
Social factors
Psychological/ mental factors
Interpersonal relationships

Task factors
Guidelines/ procedures/ protocols
Decision aids
Task design

Working condition factors
Administrative
Design of physical environment
Environment
Staffing
Workload and hours time

Team factors
Role congruence
Leadership
Support + cultural factors

Organisational + strategic factors
Organisational structure
Priorities
Externally imported risks
Safety culture

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http://www.nrls.npsa.nhs.uk/resources/collections/root-cause-analysis/

RCA and IC teams daily work

- **Many tools and methods are available**
  - Fishbone diagram
  - Five why's
  - Causal tree analysis
  - Affinity diagram
- **Documentation is easy to find**
  - NHS root cause analysis tools
  - France HAS RCA guide

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Root Cause Analysis - end 2017: several good experiences!

- **Corwin GS *et al***. Root cause analysis of ICU adverse events in the veterans health administration. *Jt Comm J Qual patient Saf* **2017**; 43(11): 580-590
  - 84% of the implemented actions had a better reported effectiveness
- **Boussat B *et al***. Involvement in root cause Analysis and patient safety culture among hospital care providers, *J patient Saf **2017**, doi:10,1097/PTS.0000000000000456*
  - Participation in routine RCA activities was associated with higher patient safety culture scores
- **Abdi Z, Ravaghi H**. Implementing RCA in Iranian hospitals: challenges and benefits. *Int J Health Plann manage **2017**; 32*(2): 147-62
  - RCA improved patient care, fostered teamwork and communication among staff, safety culture
- **Tchangai B *et al***. Incidence, root cause, and outcomes of unintentionally retained intraabdominal surgical sponges: a retrospective case series from two hospitals in Togo. *Patient Saf Surg*. **2017**; *26: 11:25*.

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Focus

- **Percarpio KB, Watts BV.** A cross sectional study on the relationship between the utilization of RCA and patient safety at 139 Department of Veterans Affairs medical centers, USA *Jt Comm J Qual Patient Saf.* **2013**;39:32-7
  - Analysis on RCA utilization from 2004 through to 2006
  - Average utilization rate 4.86 RCA per year (3-59)
  - Postoperative sepsis was significantly different across RCA utilization
  - Higher rates of postoperative complications when < 4 RCA/ year

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Focus

- **Peterson TH, Teman SF, Connors RH.** A safety culture transformation: its effects at a children's hospital. USA. *J Patient Saf.* **2012**;8:125-30.
  - Implementation of a 2-year initiative to improve patient safety
    - Safety-based staff training
    - **Training in root cause analysis**
    - Other trainings and multidisciplinary collaboration
    - Transparency of safety events
  - Results
    - Hand hygiene compliance 56% ⟶ 95%
    - Ventilator associated pneumonia bundle adherence 2% → 96%
    - Major decrease of ventilator associated pneumonias

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Root Cause Analysis : mitigated experiences!

- **Hibbert P *et al*.** Are root cause analyses recommendations effective and sustainable? An observational study. *Int J Qual Health Care* **2018**; 1-8
  - 227 RCAS reviewed
  - Few strong recommendations
- **Kellogg K *et al*.** Our current approach to root cause analysis: is it contributing to our failure to improve patient safety? *BMJ Qual Saf* **2017**; 26: 381-387
  - 302 RCA reviewed
  - 106 with solutions and actions
  - Most common actions : training (20%), process change (20%), policy reinforcement (15%)
  - But repeated events despite multiple RCA
  - Most common action = weaker actions
- **Peerally MF *et al***. The problem with root cause analysis. *BMJ Qual Saf* ***2016***, *0 : 1-6*
  - Lessons not learned
  - Poor feedback
  - Confusion about blame

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Field experience in South West France

- **Cpias Nouvelle-Aquitaine** = HAI control centre
  - Aimed to prevent HAI
  - Gives technical expertise and trainings
  - Creates tools to improve patient safety
  - Receives rare or severe HAI notifications from facilities
    - Helps for investigations
    - Promotes root cause analysis
    - Promotes sharing of experiences

Teaching videos https://www.cpias-nouvelle-aquitaine.fr/outils_videos/
Serious games https://www.cpias-nouvelle-aquitaine.fr/serious_games/
Web https://www.cpias-nouvelle-aquitaine.fr/ Twitter @CpiasNA

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RCA process

- Define the incident or near-miss to investigate
- Select a multidisciplinary team (yes but not necessary)
- Gather information (interviews, documents, observations)
- Establish the timeline of the event
- Identify problems
- Identify contributory factors and root causes (with the staff)
- Identify solutions (with the staff)
- Prioritize and implement solutions (with the staff)
- Write a report (with planned action and give it to the staff)

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Field experience example #1

- **ESBL *K. pneumoniae* bacteraemia on implanted port**
  - 68 year old woman, lumbar spinal stenosis surgery, surgical site infection leading to 3 revision surgeries + antibiotics for months.
  - Admission to a rehabilitation centre with an implanted port for antibiotics administration.
  - During hospitalization, frequent obstructions of the port. Patient transferred twice to the hospital to clear the obstruction.
  - Three weeks after admission, a bacteraemia occurred. The patient was transferred to the hospital, the implanted port was removed, central venous catheter was used, antibiotics were adapted to the micro-organism and the patient recovered.

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ESBL *K. pneumoniae* bacteraemia on implanted port

Facts	Problems	Causes	Solutions
Admission to a rehabilitation centre of a patient with an implanted port for antibiotics administration.	Nurses discovered the device at admission.	No transmission from the hospital.	Better communication between the hospital and the rehabilitation centre concerning devices to anticipate the patients arrival.
	No correct needles for this type of device in the rehabilitation centre.	Patients with central catheter and implanted port were rare in this centre so few needles were available and other types had to be ordered.	

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ESBL *K. pneumoniae* bacteraemia on implanted port

Facts	Problems	Causes	Solutions
During hospitalization, frequent obstructions of the port.	Most nurses did not know how to use and maintain such ports. No pulsed-flushing technique.	No existing protocol. Most nurses were not trained on such devices. The few nurses who knew the port did not share their experience because of bad communication in the ward.	Theoretical and practical training + protocol. Enhance communication and experience sharing in the ward.
Patient transferred twice to the hospital to clear the obstruction.	Hospital and rehabilitation centre did not realize the abnormality of so many obstructions.	HCWs in rehab. centre not aware of normality. No incidents analysis culture in the hospital.	HCWs training. Collaborative work between the 2 facilities.

ESBL *K. pneumoniae* bacteraemia on implanted port

- Prioritized solutions
  - Theoretical and practical training for health care workers of the rehabilitation centre
  - Better communication between the hospital and the rehabilitation centres concerning devices to anticipate the patients arrival

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Field experience example #2

Surgical site infections following bariatric surgery

- In a two-month period, 4 surgical site infections following bariatric surgery (mostly by-pass surgery) occurred. The IC team investigations showed universal precautions needed to be optimized.
- The IC team gave recommendations regarding hand hygiene and skin preparation.

- During the next 4 months, 7 new surgical site infections occurred. Surgical site infection rate was 8.7% in this six-month period whereas usual surgical infection rate in this ward was only 3.1%. Various micro-organisms were involved (cutaneous and digestive flora).
- The IC team decided to perform RCA.

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Surgical site infections following bariatric surgery

	Problems	Causes	Solutions
Patients	Patients usually with poor cutaneous state.	Patients with comorbidities.	
	Difficulties to shower alone before surgery.	Mechanical difficulties due to obesity.	Help patients to shower.
	Patients did not ask for help to shower before surgery.	Psychological difficulties accepting someone looking at them.	Patients education to make them aware that showering before surgery is necessary.

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Surgical site infections following bariatric surgery

	Problems	Causes	Solutions
Health care workers	Did not check the cutaneous state of patients neither that they correctly shower before surgery.	No protocol for such checking.	To integrate in the check-list the cutaneous state and the realization of the shower.
	Did not offer to help patients to shower.	Psychological difficulties to ask patients about showering and to offer help.	Awareness to make them be confident that showering before surgery is a care which needs to be checked.
		No training or protocol to help patients shower.	HCWs training + protocol.
	Wearing rings and wrist watches in the ward.	Underestimation of the risk.	Forbid rings and wrist watches.

Surgical site infections following bariatric surgery

	Problems	Causes	Solutions
Tasks	Boxes of surgery devices were opened a long time before surgery.	Increase in the activity. Small time between interventions.	Stop early box opening by respecting time between interventions and adapting the program activity.
	Complex postoperative dressings.	Ward habits.	Discussion on medical prescriptions.
	Increased nursing workload because of many patients with a Picc-line.	Picc-line were used instead of peripheral venous access in obese patients because physicians thought it was easier to use.	Only use Picc-line when justified.

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Surgical site infections following bariatric surgery

	Problems	Causes	Solutions
Context and organization	Increased nursing workload because of reduction in paramedical workers.	Institutional strategy.	
	Nurses were regularly interrupted when performing cares and dressings.	Nurses had to frequently answer the telephone.	To be more organized to stop answering the phone when performing a care.

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Surgical site infections following bariatric surgery

- Prioritized solutions
  - To help the patient to shower before surgery
    - Protocol
    - Patients and healthcare workers education
    - Cpias NA Video for patients and healthcare workers French or English
      https://www.youtube.com/watch?v=7XD0I_OCHFY
  - To be more organized to limit cares' interruption
  - To restrict the indication of PICC lines

Return to SSI baseline rate

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Field experience

- **RCA helped IC teams to be more efficient and recognized**
  - IC teams found feasible and efficient solutions
  - IC teams had the leadership so as to choose between actions
  - IC teams used RCA for their own errors and near-misses

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RCA to support IC teams daily work

- **An IC team correctly using a RCA process for a HAI**
  - implements more adequate prevention measures
  - improves clinical practices
  - improves collaborative working and teamwork
  - reduces the risk of HAI… and more!

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Conclusion

- **RCA should be integrated in IC teams daily work**
  - It is a useful tool for HAI investigation and prevention
  - It is a useful tool to improve IC teams practices
- **RCA brings value to IC teams work**

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Free tool in English : RCA for SSI

- **Surgery site infections are complex…tools are needed!**
- **A new free tool to perform RCA**
  - Excel
  - In English or French
  - https://www.cpias-nouvelle-aquitaine.fr/gdr/analyse-approfondie-causes-aac/

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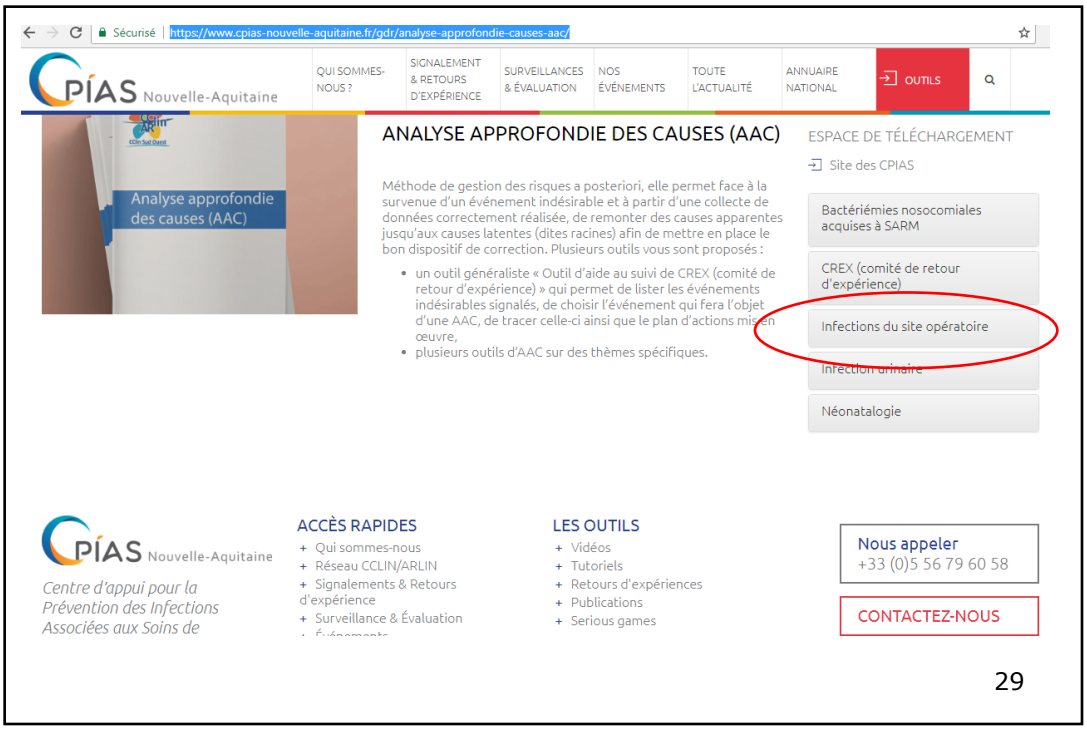
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CPIAS Nouvelle-Aquitaine
QUI SOMMES-NOUS ?
SIGNALEMENT & RETOURS D'EXPÉRIENCE
SURVEILLANCES & ÉVALUATION
NOS ÉVÉNEMENTS
TOUTE L'ACTUALITÉ
ANNUAIRE NATIONAL
OUTILS
Analyse approfondie des causes (AAC)
ANALYSE APPROFONDIE DES CAUSES (AAC)
Méthode de gestion des risques a posteriori, elle permet face à la survenue d'un événement indésirable et à partir d'une collecte de données correctement réalisée, de remonter des causes apparentes jusqu'aux causes latentes (dites racines) afin de mettre en place le bon dispositif de correction. Plusieurs outils vous sont proposés :
un outil généraliste « Outil d'aide au suivi de CREX (comité de retour d'expérience) » qui permet de lister les événements indésirables signalés, de choisir l'événement qui fera l'objet d'une AAC, de tracer celle-ci ainsi que le plan d'actions mis en œuvre,
plusieurs outils d'AAC sur des thèmes spécifiques.
ESPACE DE TÉLÉCHARGEMENT
Site des CPIAS
Bactériémies nosocomiales acquises à SARM
CREX (comité de retour d'expérience)
Infections du site opératoire
Infection urinaire
Néonatalogie
CPIAS Nouvelle-Aquitaine
Centre d'appui pour la Prévention des Infections Associées aux Soins de
ACCÈS RAPIDES
Qui sommes-nous
Réseau CCLIN/ARLIN
Signalements & Retours d'expérience
Surveillance & Évaluation
LES OUTILS
Vidéos
Tutoriels
Retours d'expériences
Publications
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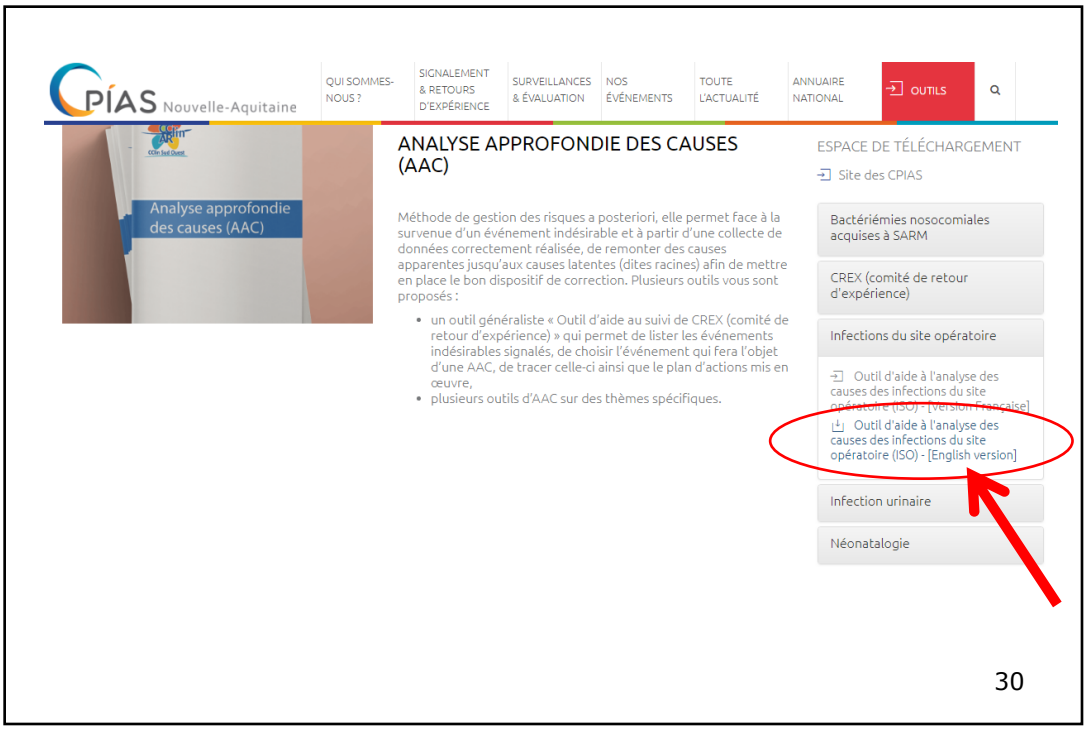
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Outil d'aide à l'analyse des causes des infections du site opératoire (ISO) - [English version]
Infection urinaire
Néonatalogie
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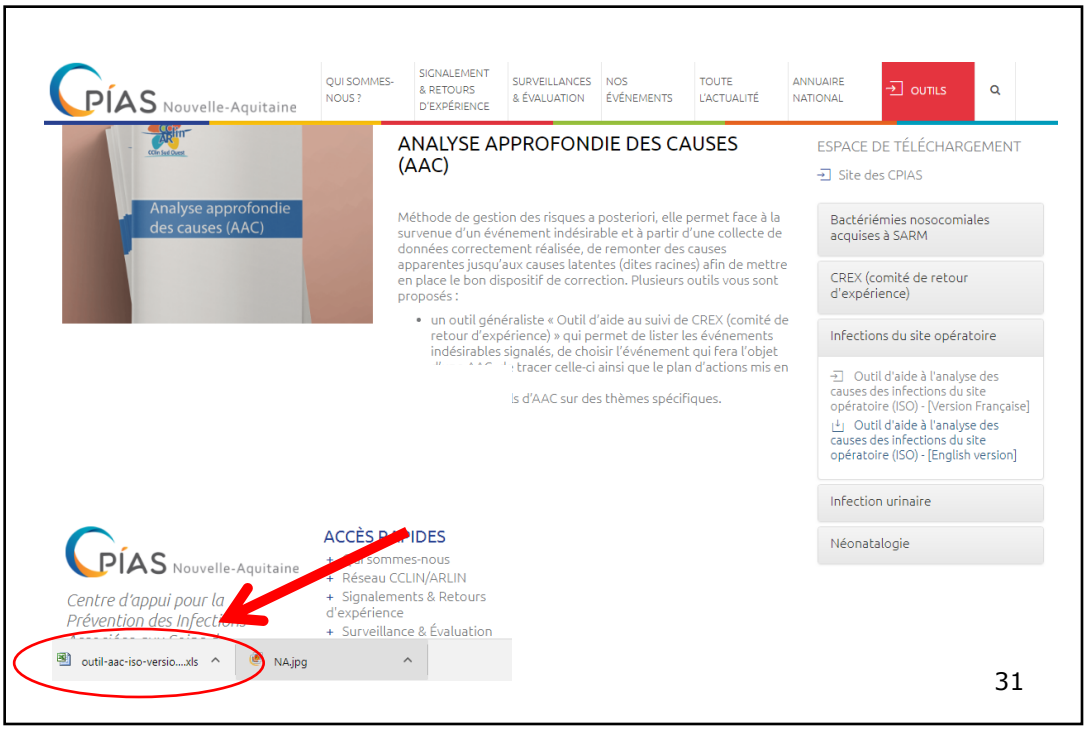
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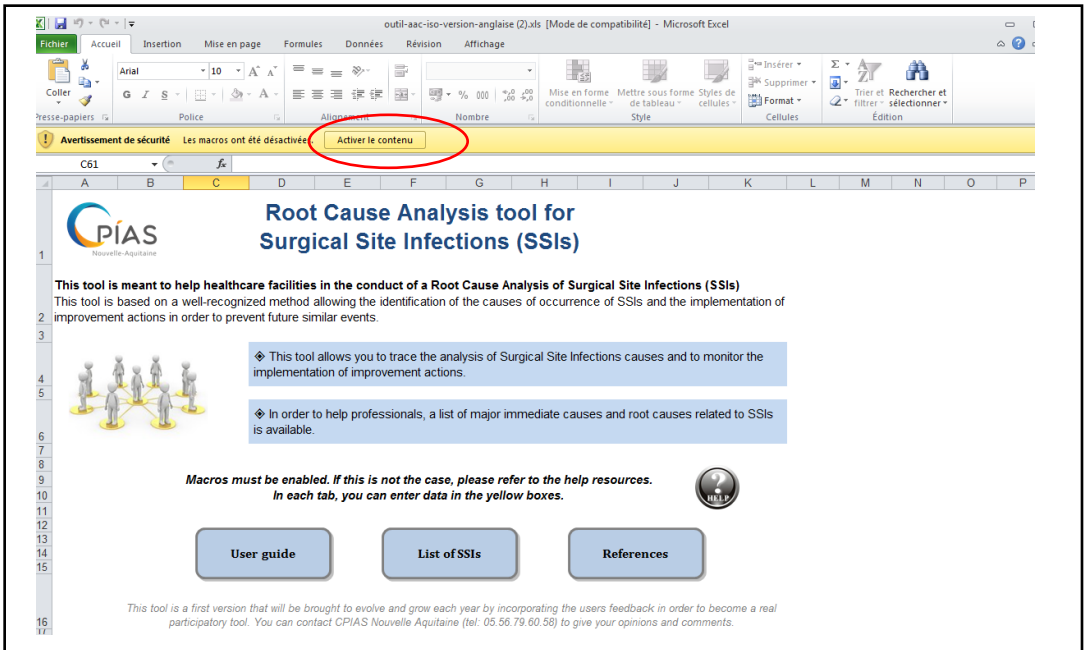
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Avertissement de sécurité
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C61
CPIAS Nouvelle-Aquitaine
Root Cause Analysis tool for Surgical Site Infections (SSIs)
This tool is meant to help healthcare facilities in the conduct of a Root Cause Analysis of Surgical Site Infections (SSIs)
This tool is based on a well-recognized method allowing the identification of the causes of occurrence of SSIs and the implementation of improvement actions in order to prevent future similar events.
This tool allows you to trace the analysis of Surgical Site Infections causes and to monitor the implementation of improvement actions.
In order to help professionals, a list of major immediate causes and root causes related to SSIs is available.
Macros must be enabled. If this is not the case, please refer to the help resources.
In each tab, you can enter data in the yellow boxes.
User guide
List of SSIs
References
This tool is a first version that will be brought to evolve and grow each year by incorporating the users feedback in order to become a real participatory tool. You can contact CPIAS Nouvelle Aquitaine (tel: 05.56.79.60.58) to give your opinions and comments.

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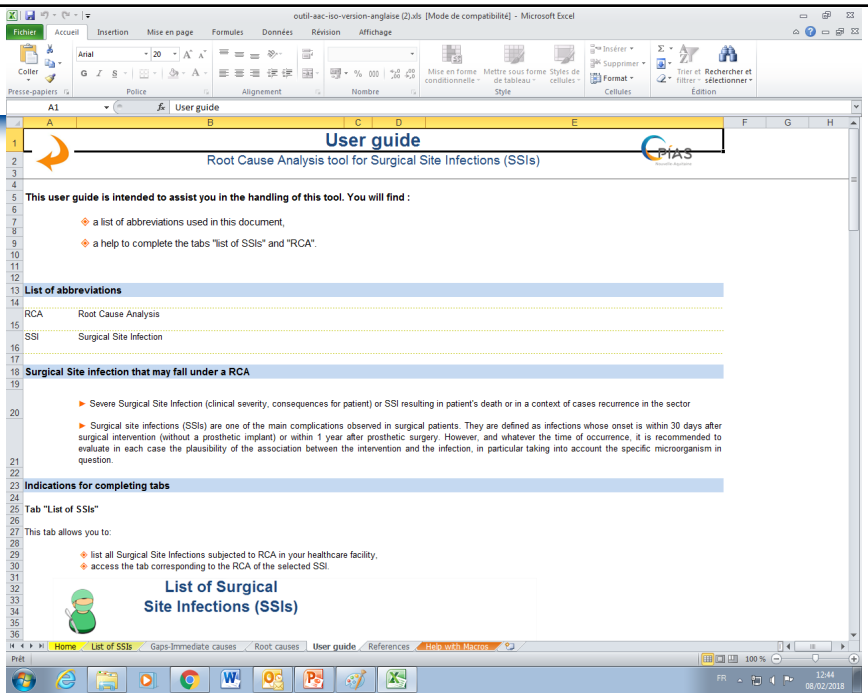
Root Cause Analysis to Support IC Teams Daily Work
Dr Anne-Gaëlle Venier, Cpias Nouvelle-Aquitaine, Bordeaux, France
A Webber Training Teleclass



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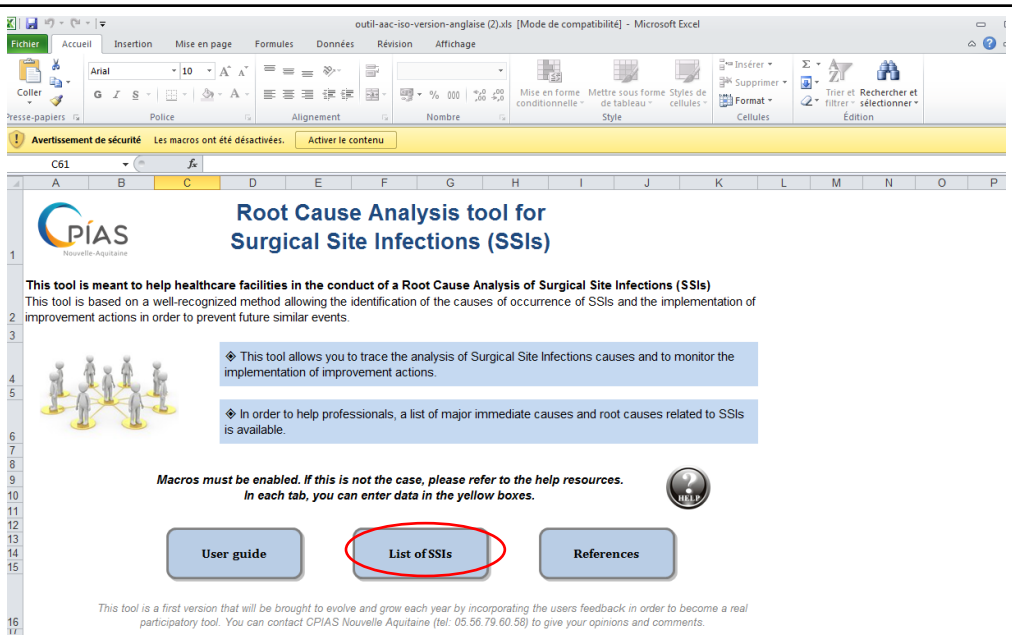

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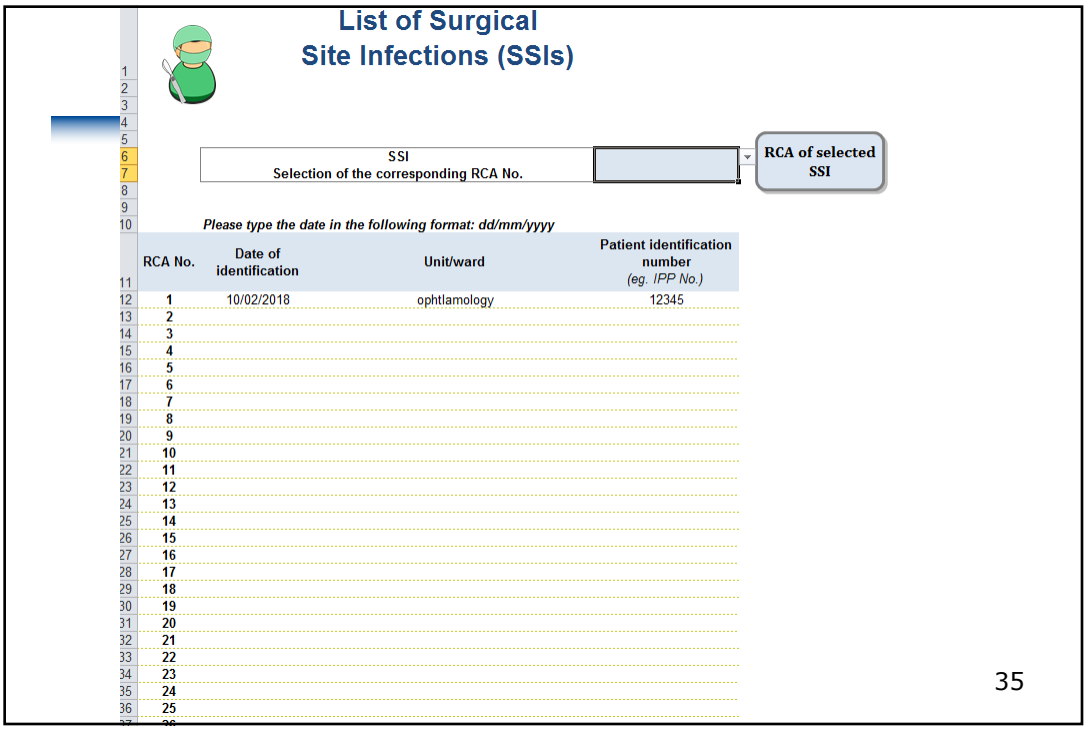

List of Surgical Site Infections (SSIs)

SSI
Selection of the corresponding RCA No.

RCA of selected SSI

Please type the date in the following format: dd/mm/yyyy

RCA No.	Date of identification	Unit/ward	Patient identification number (eg. IPP No.)
1	10/02/2018	ophtlamology	12345
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
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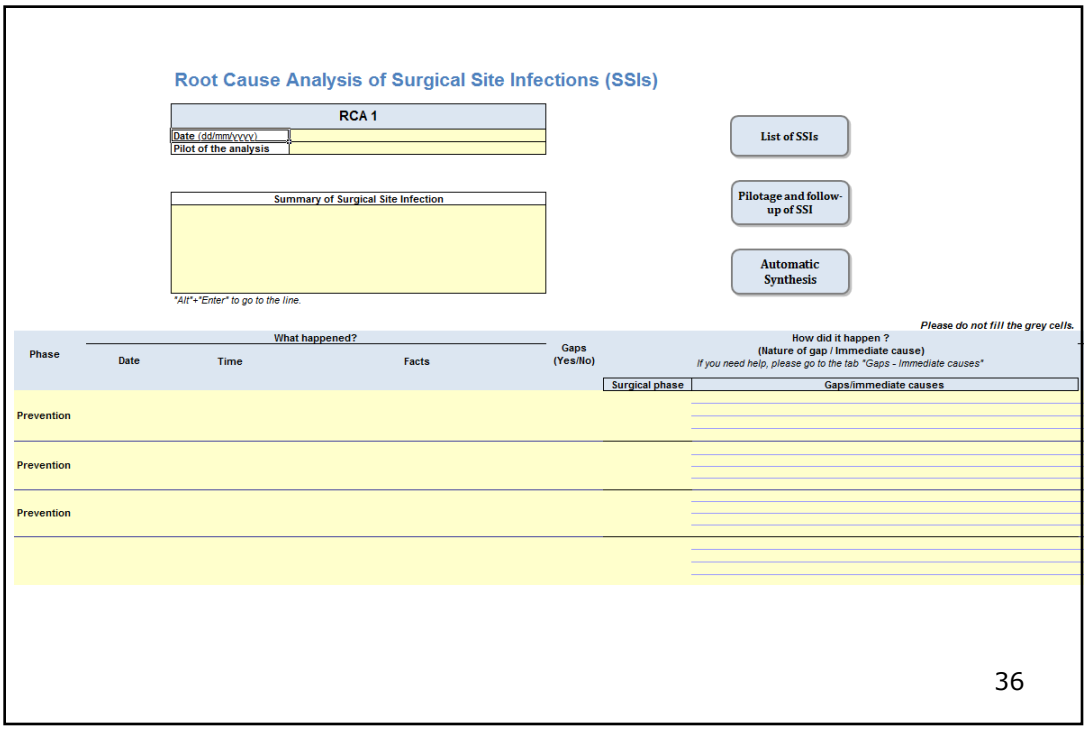

Root Cause Analysis of Surgical Site Infections (SSIs)

RCA 1

Date (dd/mm/yyyy)
Pilot of the analysis

List of SSIs

Pilotage and follow-up of SSI

Automatic Synthesis

Summary of Surgical Site Infection

"Alt"+"Enter" to go to the line.

Please do not fill the grey cells.

Phase	What happened? Date	Time	Facts	Gaps (Yes/No)	How did it happen ? (Nature of gap / Immediate cause) *If you need help, please go to the tab "Gaps - Immediate causes"* Surgical phase	Gaps/immediate causes
Prevention						
Prevention						
Prevention						

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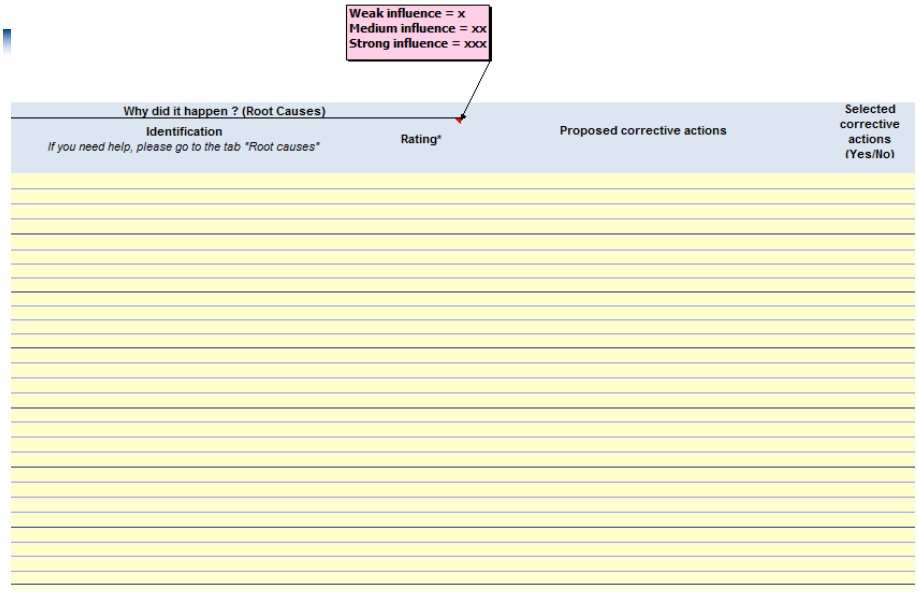

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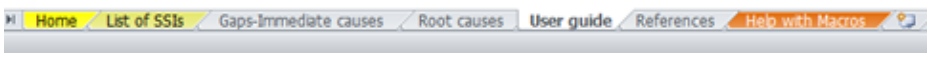
Help to search immediate causes and root causes



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Please note that this list is not exhaustive and that it will be enriched each year by integrating the users experiences.

Chronological description of the event		Gaps/Immediate causes
Preoperative	Invasive act(s) during the 3 months prior to surgery (for some slow-growing microorganisms, the entrance may occur before surgery)	Inadequate skin antisepsis before infiltration / injection at the concerned site
		Inappropriate hand hygiene and unsuitable clothing before infiltration / injection at the concerned site
		Principles of asepsis not respected
		Inappropriate management of antisepics
		Inadequate maintenance of equipment and supplies
		Inappropriate storage and preparation of medicinal products
	Preoperative consultations	Inappropriate assessment and management of patient's risk factors (eg. diabetes, obesity, age, immunosuppression, treatment of pre-existing infections, etc.)
		Inappropriate surgical indication
		Inappropriate screening and decolonization of S. Aureus
		Inadequate realization of urine test strip / urine culture examination before surgery (eg, programmed urological surgery)
		Inadequate patient information (content, form, support, modalities)
		If Outpatient: inappropriate risk assessment of home return after surgery (clinical, cognitive and social status of the patient, anticipated management)
	Patient	Inappropriate hair removal by the patient before surgery (eg. razor, waxing) on or near the surgical site
		Non-respect of preventive measures by the patient (eg. shower, diet, treatment, oral hygiene)
		Presence of cutaneous wound, eschar, dermatosis
		No smoking cessation
	Day of intervention	Inadequate preoperative shower(s)
		Inappropriate check of preoperative shower(s)
		Assistance in shower not available or not optimal
		Inappropriate check of hair removal
		inadequate or unperformed verification of the absence of contraindications to the surgical intervention (eg. infection in progress)
		Intervention performed despite contraindication(s)
		Unsuitable professional clothing (eg unsuitable surgical attire; inappropriate wearing of mask, gloves and surgical cap; wearing of jewellery)

+ perioperative + postoperative causes

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Please note that this list is not exhaustive and that it will be enriched each year by integrating the users experiences.

ROOT CAUSES		
Related to patient	State of health	Medical history (eg. MRSA carriage, dental care, invasive medical procedures during the last month: thoracentesis, lumbar puncture, paracentesis, pericardiocentesis...)
		Risk factors / co-morbidities: degree of prematurity, birth weight, blood transfusion, diabetes, corticotherapy, obesity, splenectomy, pregnancy in progress, complex anticoagulation, prolonged preoperative hospitalization, ASA score > 2, Altemeier classification...
	Personality, social or familial factors	Comprehension problems, language barriers, oral expression
		Poor quality of patient / family relationship with health professionals and healthcare.
		Peculiar familial / social factors: occupation, habitus, environment, familial role, addictions, elderly person, child ...
		Non-involvement of family
	Context	Patient management in an emergency context
Individual factors (related to the professional)	Qualification, skills	Inadequacy of qualifications, skills (know-how), knowledge or behavior.
		Lack of aptitude, training, adaptation (eg. trivialization of the act of care, non-compliance with recommendations)
		Lack of training in technical skills (eg. new surgical techniques)
		Lack of training in non-technical skills (eg. teamwork)
		Lack of motivation
	Physical and psychological factors	Poor physical or mental disposition (stress, fatigue, hunger, illness, personal worries)
Related to tasks	Protocols/Procedures	Absent, unsuitable or incomprehensible, unavailable, insufficiently known, not followed, not actualized
	Additional medical examinations	Delay in the delivery or programming of clinical and paraclinical examinations
		Difficulty in carrying out or not carrying out an examination
		Difficult access or unavailability of examination results
		Delays in the transmission of results inadequate to the clinical condition of the patient
		Doubts about the reliability or relevance of the results (oral, incomplete or low quality transmission, failure to identify the patient)
		Disagreements or doubts about the interpretation of examination results (lack of specialized advice ...)
	Task definition	Unclear job definition (what staff, what skills, what act, what time frame and for which result)
	Help to decision	Absence or inadequate use of technical means when making decisions: specific equipment, decision algorithm, software, recommendations ...)

… more root causes in the excel tool

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RCA for SSI: don't hesitate to use it!

- **BEFORE you perform the RCA with the staff, please:**
  - Read the literature and look at youtube video about the type of surgery + antibioprophylaxy, search if there are new recommendations about this surgery + antibioprophylaxy
  - Prepare the file with the most complete story and the immediate causes you think that happened
  - Read the sheets "immediate causes" and "root causes" in order to not be compelled to look at them systematically during the analysis

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RCA for SSI: don't hesitate to use it!

- **When you perform the RCA with the staff, please:**
  - Enhance dialogues with goodwill
  - Try to finish in one hour maximum
  - Keep the discussion focussed on the event
  - Ask the staff to choose one or two actions they assume to do and guide them to choose actions that will really avoid a new event

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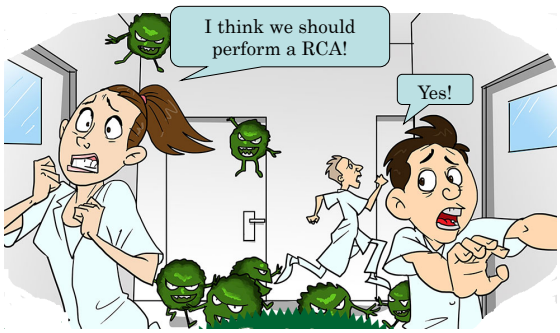
Thank you for your attention

Learn from yesterday, live for today, hope for tomorrow.
The important thing is not to stop questioning.

Albert Einstein



Serious game Flu.0©

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February 28, 2018	*(FREE … WHO Teleclass - Europe)* **WHY LEADERSHIP MATTERS FOR EFFECTIVE INFECTION PREVENTION AND CONTROL** Speaker: **Julie Storr**, World Health Organization **Sponsored by the World Health Organization Infection Prevention and Control Global Unit**
March 8, 2018	**INFECTION PREVENTION IN NURSING HOMES AND PALLIATIVE CARE** Speaker: **Prof. Patricia Stone**, Columbia University, New York
March 15, 2018	***CLOSTRIDIUM DIFFICILE* ASYMPTOMATIC CARRIERS – THE HIDDEN PART OF THE ICEBERG** Speaker: **Dr. Yves Longtin**, McGill University, Montreal
March 22, 2018	**CHALLENGES AND FACILITATORS TO NURSE-DRIVEN ANTIBIOTIC STEWARDSHIP: RESULTS FROM A MULTISITE QUALITATIVE STUDY** Speaker: **Prof. Eileen J. Carter**, Columbia University School of Nursing
	(FREE European Teleclass … Denver Russell Memorial Teleclass Lecture) **HOPES, HYPES, AND MULTIVALLATE DEFENCES AGAINST ANTIMICROBIAL RESISTANCE**

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