

Procedures (process)

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Quality indicators

- Structures
- Processes
- Outcomes

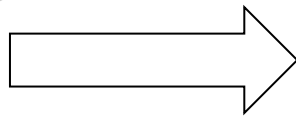
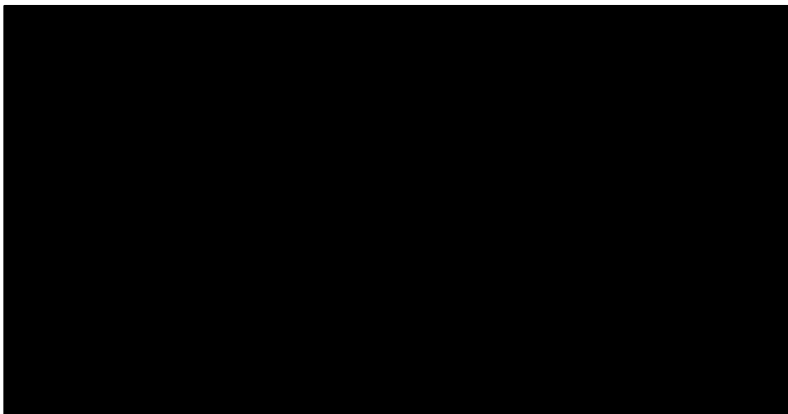
- Reviewing the quarterly data, the Infection Control Team is aware that SSI rate was higher than expected in rectal surgery for all NNIS groups.
- Infections occurred all across the quarter and were caused by different organisms. No association with surgeon/team was evident.

Next?

- Procedures review (but infections already occurred)?
- Case-control study to try and identify modifiable risk factors?
- Start a cohort study to identify risk factors if rate seems to still be high?

■ ...

Lecture Library



Outcome

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- The ICT reviewed the VAP rates (cases/1,000 ventilator-days) in the ICU of a tertiary hospital...
 - Local quarterly rates range last 2years: 1.5 – 3.7
 - Benchmarking rates: 3.5
- Report:
 - Since our rates are lower than comparator, we will continue with the ongoing activities

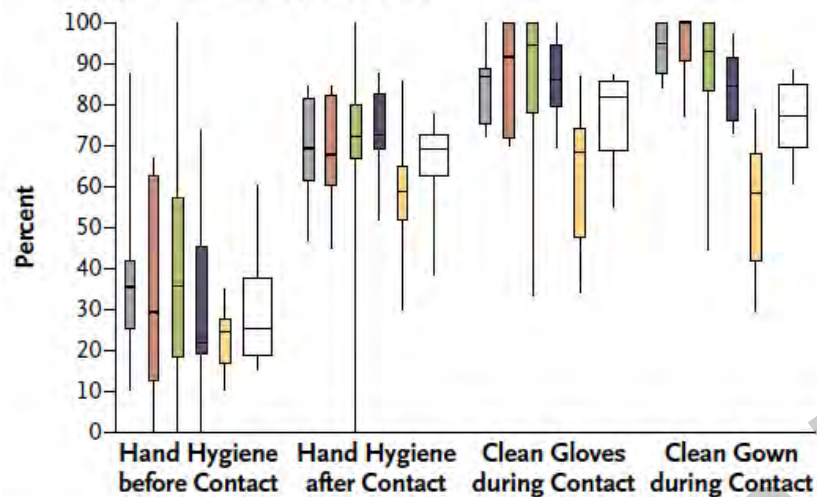
- No doubts about the importance of outcome indicators, but
- ...may be helpful to prevent further events but not those which already occurred
- ...does not provide data about the intervention opportunities
- ...even “good” outcome rates may hide important opportunities for improvement

Process

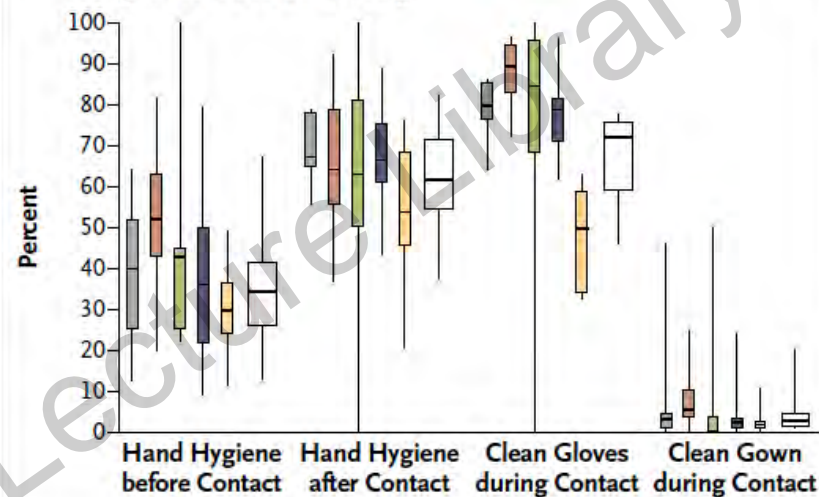
- Adherence to hand hygiene
- Adherence to transmission-specific precautions
- Environmental cleaning
- Disinfection procedures
- Preventive measures (HAP/VAP, CLABSI, UTI, SSI)
- Quality of antibiotic prescription

Contaminated
 Blood or body fluid
 Invasive device
 Other patient
 Environment only
 All

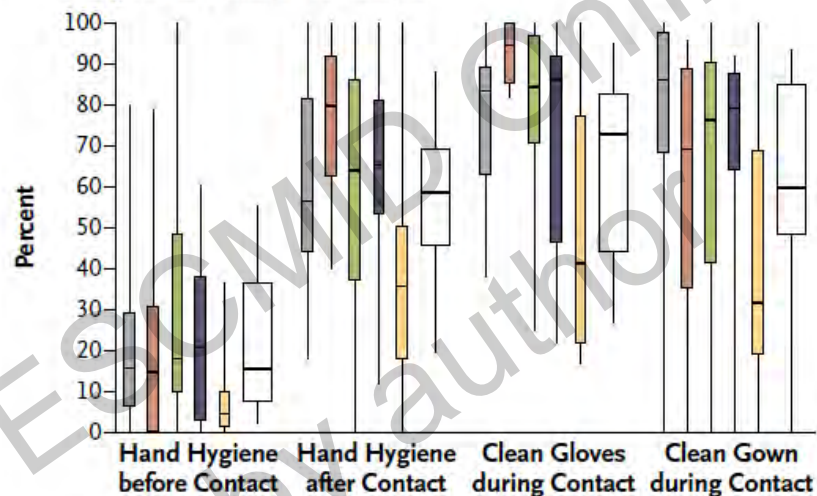
A Intervention ICUs — Component Measures for Contacts with Patients Assigned to Contact Precautions



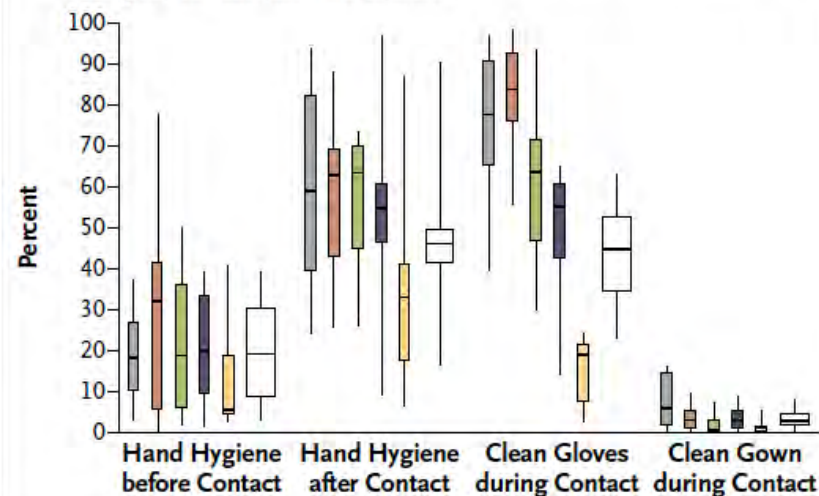
B Intervention ICUs — Component Measures for Contacts with Patients Assigned to Universal Gloving



C Control ICUs — Component Measures for Contacts with Patients Assigned to Contact Precautions



D Control ICUs — Component Measures for Contacts with Patients Assigned to Standard Precautions



Impact of Electronic Surveillance on Isolation Practices

Elaine Larson, RN, PhD, CIC, FAAN;^{1a} Maryam Behta, PharmD;^{2a} Bevin Cohen, MPH;¹ Haomiao Jia, PhD;¹
 E. Yoko Furuya, MD, MS;³ Barbara Ross, RN, BSN, CIC;⁴ Rohit Chaudhry, MS;⁵
 David K. Vawdrey, PhD;⁵ Katherine Ellingson, PhD⁶

Infect Control Hosp Epidemiol 2013

TABLE 2. Frequency of Appropriate Sign Posting, Equipment Availability, and Staff and Visitor Adherence to Precautions

Practice	Baseline (reference)	Admission screen	Provider order screen	Clinical staff screen	All post- intervention phases
Isolation sign posted^a					
Percentage	91.8	92.0	92.2	93.1	92.4
Numerator/denominator	7,295/7,950	13,808/15,010	7,784/8,447	12,877/13,835	34,469/37,292
OR (95% CI)	...	...	...	1.21 (1.09–1.34)	1.10 (1.003–1.200)
Isolation cart present^a					
Percentage	94.1	94.7	92.8	93.3	93.7
Numerator/denominator	6,602/7,015	12,615/13,322	6,997/7,537	11,576/12,413	31,188/33,272
OR (95% CI)	...	...	...	...	...
Gloves available^a					
Percentage	94.9	95.9	94.5	95.0	95.3
Numerator/denominator	7,544/7,950	14,397/15,010	7,984/8,447	13,142/13,833	35,523/37,290
OR (95% CI)	...	1.26 (1.11–1.44)	...	...	...
Appropriate donning of PPE^b					
Percentage	29.1	28.4	33.1	37.0	31.8
Numerator/denominator	456/1,568	765/2,693	520/1,573	644/1,794	1,929/6,060
OR (95% CI)	...	...	1.20 (1.04–1.40)	1.37 (1.18–1.58)	1.14 (1.01/1.29)

Impact of a multimodal intervention to reduce bloodstream infections related to vascular catheters in non-ICU wards: a multicentre study

Clin Microbiol Infect 2013

N. Freixas¹, F. Bella², E. Limón³, M. Pujol^{3,4}, B. Almirante⁵ and F. Gudiol^{3,4}

TABLE 5. Adherence to the recommended precautionary measures evaluated in the point-prevalence studies*

Item evaluated	Central venous catheters ^a					Peripheral venous catheters				
	Baseline observation (266 catheters)		Follow-up observations ^b (877 catheters)		p	Baseline observation (1809 catheters)		Follow-up observations ^b (5654 catheters)		p
	No.	% (95% CI)	No.	% (95% CI)		No.	% (95% CI)	No.	% (95% CI)	
Catheter was needed	254	95.5 (92.3–97.7)	831	94.8 (93.1–96.1)	0.75	1512	83.6 (81.9–85.3)	4832	85.5 (84.5–86.4)	0.05
PVC dwell time was correct	NA	NA	NA	NA	–	1156	63.9 (61.7–66.1)	4193	74.2 (73.0–75.3)	<0.001
Dressing was intact	212	79.7 (74.9–84.5)	791	90.2 (88.0–92.1)	<0.0001	1406	78.7 (75.8–79.6)	4904	86.7 (85.9–87.6)	<0.001
The infusion set was correct	231	86.8 (82.8–90.9)	772	88.0 (85.9–90.2)	0.68	1491	82.4 (80.7–84.2)	4514	79.8 (78.8–80.9)	0.02
No phlebitis	266	100 (98.6–100)	867	98.9 (97.9–99.5)	0.16	1764	97.5 (96.7–98.2)	5487	97.0 (96.6–97.5)	0.33
Catheter use was recorded	231	86.8 (82.8–90.9)	782	89.2 (87.1–91.2)	0.34	1446	79.9 (78.1–81.8)	4849	85.8 (84.9–86.7)	<0.001
All the items evaluated were correct	159	59.8 (53.9–65.7)	631	72.0 (69.0–74.9)	<0.001	785	43.4 (41.1–45.7)	3080	54.5 (53.2–55.8)	<0.001

TABLE 3. Catheter-related bloodstream infections in the pre-intervention (2009) and post-intervention (2010) periods

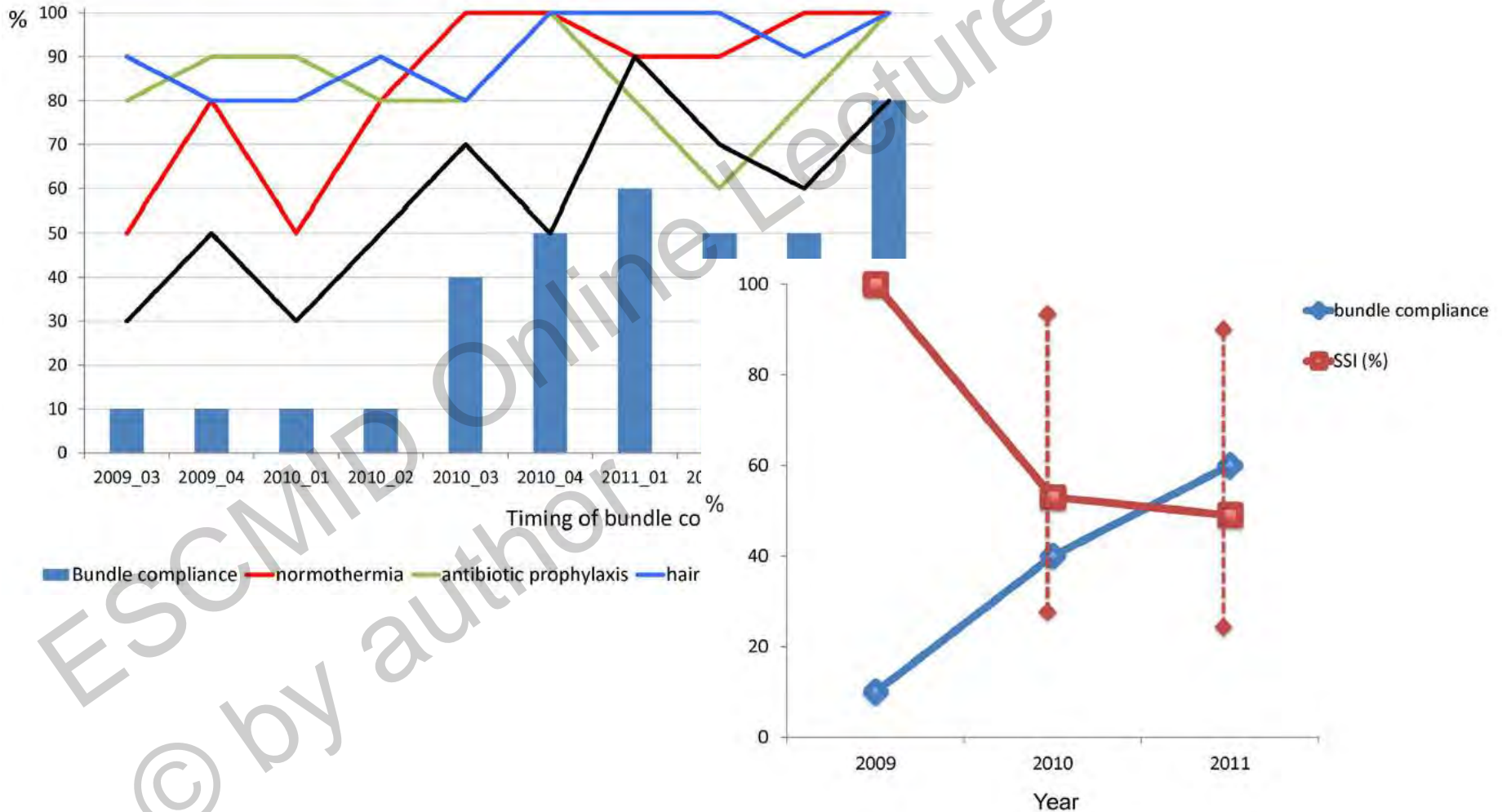
Catheter type	2009				2010				
	No. of CRBSI	No. of patient-days	CRBSI per 1000 patient-days	95% CI	No. of CRBSI	No. of patient-days	CRBSI per 1000 patient-days	95% CI	p
CVC	166	1 191 843	0.14	0.12–0.16	115	1 173 672	0.10	0.08–0.11	0.004
PVC	54	1 191 843	0.05	0.03–0.6	61	1 173 672	0.05	0.04–0.07	0.52
Overall	220	1 191 843	0.19	0.16–0.21	176	1 173 672	0.15	0.13–0.18	0.04

CRBSI, catheter-related bloodstream infections; CVC, central venous catheter (also including peripherally inserted central venous catheters); PVC, peripheral venous catheter.

Implementation of a Bundle of Care to Reduce Surgical Site Infections in Patients Undergoing Vascular Surgery

Jasper van der Slegt^{1*}, Lijckle van der Laan¹, Eelco J. Veen¹, Yvonne Hendriks², Jannie Romme², Jan Kluytmans^{2,3}

PLoS ONE 2013



Effectiveness of a multidimensional approach for prevention of ventilator-associated pneumonia in adult intensive care units from 14 developing countries of four continents: Findings of the International Nosocomial Infection Control Consortium*

Crit Care Med 2012

Victor D. Rosenthal, MD; Camilla Rodrigues, MD; Carlos Álvarez-Moreno, MD; Naoufel Madani, MD; Zan Mitrev, MD; Guxiang Ye, MD; Reinaldo Salomao, MD; Fatma Ulger, MD; Humberto Guanche-Garcell, MD; Souha S. Kanj, MD; Luis E. Cuéllar, MD; Francisco Higuera, MD; Trudell Mapp, RN; Rosalía Fernández-Hidalgo, MSc; and INICC members

Table 3. Hand-hygiene compliance and mechanical ventilator care in the participating adult intensive care units

	Phase 1		Phase 2	
	Baseline Period (mos 1–3)	Intervention Period	% of Change	<i>p</i>
Adherence to hand-hygiene guidelines % (n)	55.0%	65.7%	17%	.0001

Table 4. Ventilator-associated pneumonia rates in the participating adult intensive care units

	Phase 1		Phase 2	
	Baseline Period	Intervention Period	Relative Risk (95% Confidence Interval)	<i>p</i>
Number of VAP	226	2,191		
Number of mechanical ventilator days	10,292	127,374		
VAP rate per 1,000 mechanical ventilator days	22.0	17.2	0.78 (0.68–0.90)	.0004
VAP rate per 100 patients	5.8%	4.2%	0.73 (0.64–0.84)	.0001
Mortality per 100 patients (95% confidence interval)	14% (12.7–14.9)	15% (14.9–15.6)		

Effect of central line bundle on central line-associated bloodstream infections in intensive care units

Ihn Sook Jeong RN, PhD^{a,*}, Soon Mi Park RN, MSN^b, Jeon Ma Lee RN, MSN^b, Ju Yeon Song RN, MSN^c, Su Jin Lee MD, PhD^c

Am J Infect Control 2013

Table 2

Adherence to central line bundle during baseline and intervention period

	Adults in ICUs		P value
	Baseline (n = 100)*	Intervention (n = 375)*	
Hand hygiene, n (%)	99 (99.0)	374 (99.7)	.317 [†]
Maximum barrier precaution, n (%)	31 (31.0)	314 (83.7)	<.001 [‡]
Mean ± SD	2.4 ± 1.8		
Chlorhexidine skin antisepsis, n (%)	0 (0.0)	150 (40.0)	<.001 [‡]
Appropriate site avoiding femoral, n (%)	94 (94.0)	365 (97.3)	.118 [†]
Entire adherence to CL bundle, n (%)||	0 (0.0)	139 (37.1)	<.001 [‡]
Mean ± SD	2.2 ± 0.6	3.2 ± 0.7	

Table 3

Central line-associated bloodstream infection rate during baseline and intervention period

	Adults in ICUs			
	Baseline	Intervention	RR (95% CI)	P value
CLABSI rate				
Per 100 patients	7.6	2.3	0.30 (0.09-1.07)	.021
Per 100 CVC insertions	6.0	1.9	0.31 (0.09-1.12)	.026
Per 1,000 patient-days	3.0	1.2	0.41 (0.12-1.49)	.101
Per 1,000 CVC-days	4.7	1.8	0.39 (0.11-1.39)	.076

“The 3/3 Strategy”: A Successful Multifaceted Hospital Wide Hand Hygiene Intervention Based on WHO and Continuous Quality Improvement Methodology

PLoS ONE 2012

Gabriel Mestre^{1*}, Cristina Berbel¹, Purificación Tortajada¹, Margarita Alarcia², Roser Coca², Gema Gallemi², Irene Garcia², Mari Mar Fernández², Mari Carmen Aguilar², José Antonio Martínez³, Jesús Rodríguez-Baño⁴

Phase 1

Phase 2

5. Feedback	Tables and bar graphs through were shown through informal interactive sessions on every ward at the end of evaluation period. Data were introduced in a centralized computer system for benchmarking.	Regularly bimonthly feedback using control charts (Statistical Process Control) on every ward at institutional and individual level were provided.
6. Safety institutional climate	Institutional Commitment by administrative and nursing director	This support was maintained during this period
7. Proactive corrective actions	Not performed	Corrective actions were registered in a specific form. Modification of incorrect HH habits, clarification of doubts and positive reinforcement were conducted.

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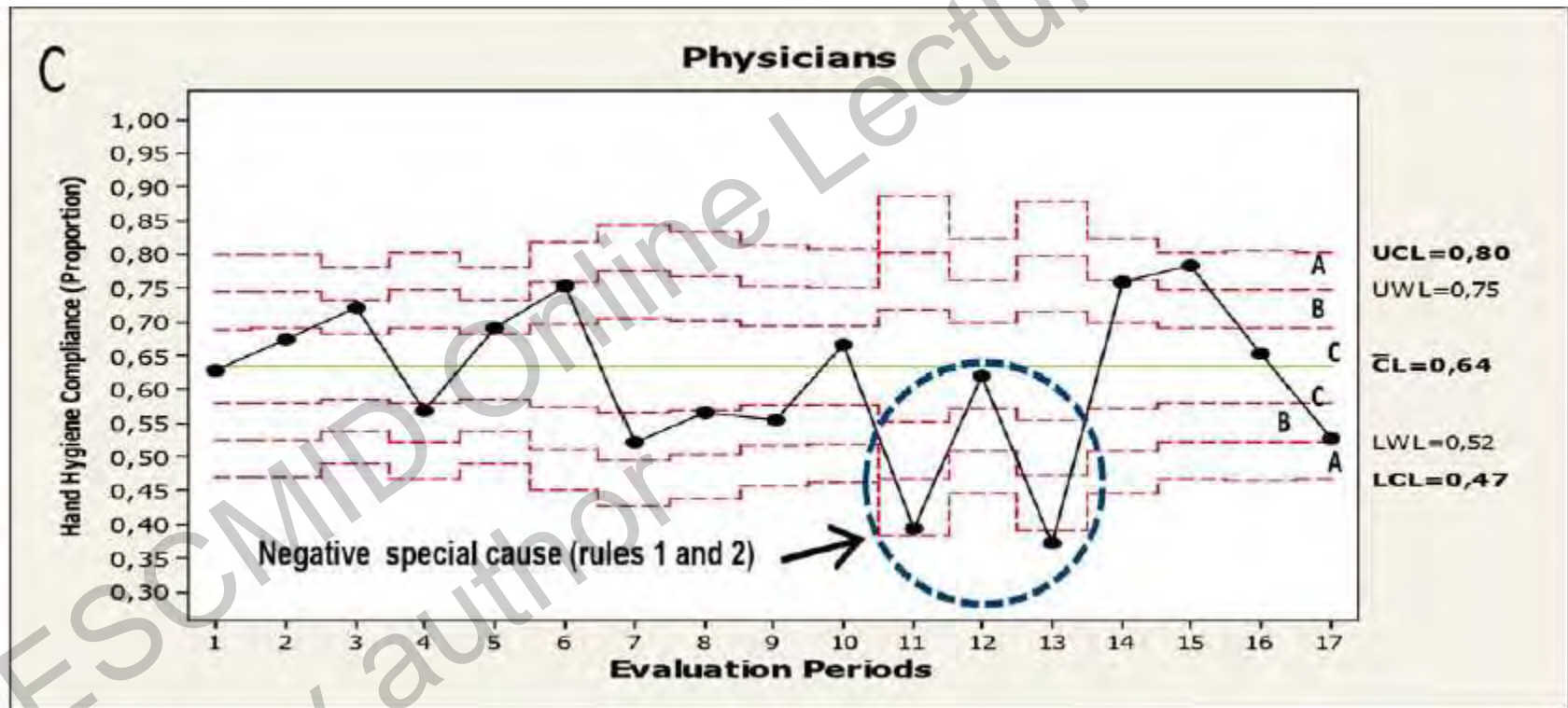
Table 2. Hand hygiene compliance at preintervention period (t0), phase 1 intervention (t1) and phase 2 intervention (t2).

Variable	t0	t1	t2	X ² for trend (p)
	March 2007– December 2009	January 2010– December 2010	January 2011– December 2011	
No of observations	3,881	4,095	7,619	
Overall compliance, % (95% CI)	57 (55.9–59.0)	78 (79.4–80.7)	84 (83.8–85.4)	<.0001
Adherence to the 5 WHO HH moments				
1. Before touching a patient				
No. of observations	1,281	1,681	2,736	
Compliance, % (95% CI)	43 (40.6–46.0)	76 (74.2–78.3)	82 (80.6–83.6)	<.0001
2. Before clean/aseptic procedure				
No. of observations	469	454	789	
Compliance, % (95% CI)	60 (55.7–64.6)	71 (66.9–75.3)	74 (71.3–77.7)	<.0001
3. After body fluid exposure risk				
No. of observations	567	315	661	
Compliance, % (95% CI)	73 (70.3–77.5)	82 (78.1–86.4)	83 (80.3–86.1)	<.0001
4. After touching a patient				
No. of observations	1,564	1,358	2,917	
Compliance, % (95% CI)	62 (59.9–64.7)	84 (82.7–86.5)	91 (90.1–92.2)	<.0001
5. After touching patient surroundings*				
No. of observations	NE	449	956	
Compliance, % (95% CI)	NE	95 (92.5–97.2)	77 (74.7–80.1)	

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The process of defining processes...

- Select key preventive measures (bundle)
 - Evidence-based and independently associated to outcomes whenever possible
- Define the indicator for each of them
 - Measurable, easy, reliable, accurate...
- Define: source of data, surveillance method (point prevalence vs continuous), number of observations needed, analysis, etc.
- Communicate with responsible staff
- Pilot and modify if needed

Process surveillance

- Program actions to be undertaken if deviation occur
 - Immediate advice / alert
 - Educational sessions
 - Routine periodic feed back

Challenges

- Benchmarking of process indicators
 - Evidence
 - Definition
- Time consuming
- Should be associated with action



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