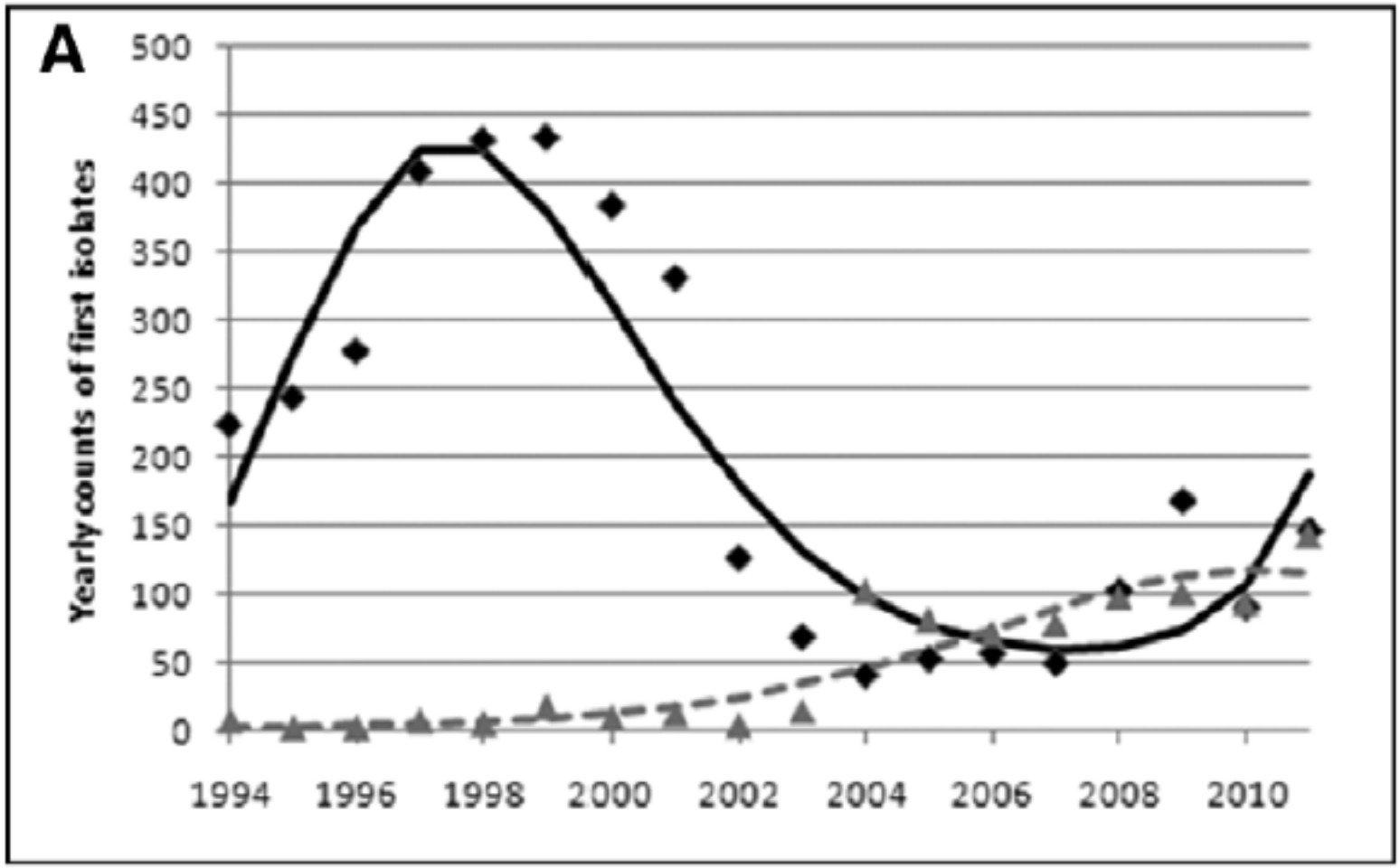
Control de la Transmisión de Bacilos Gram-negativos multi-resistentes

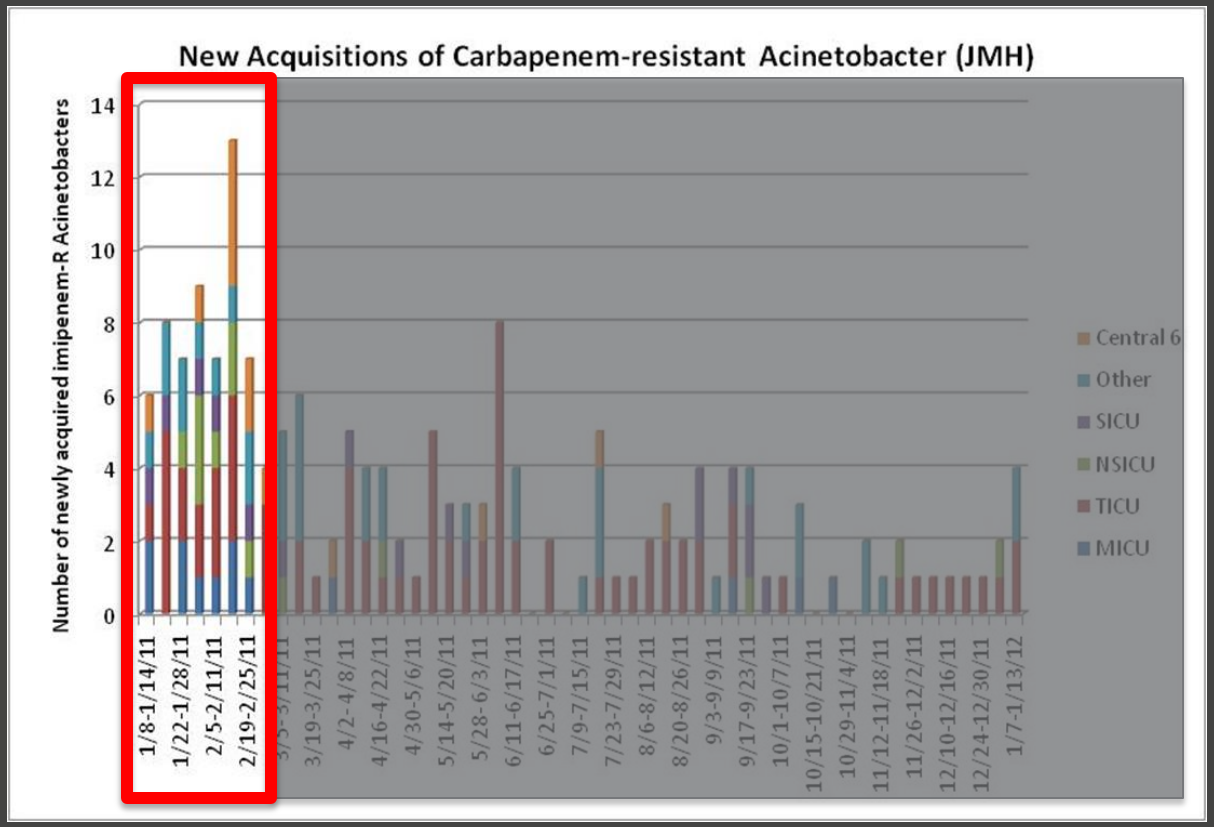
L. Silvia Munoz-Price, MD, PhD
Enterprise Epidemiologist
Froedtert & Medical College of Wisconsin

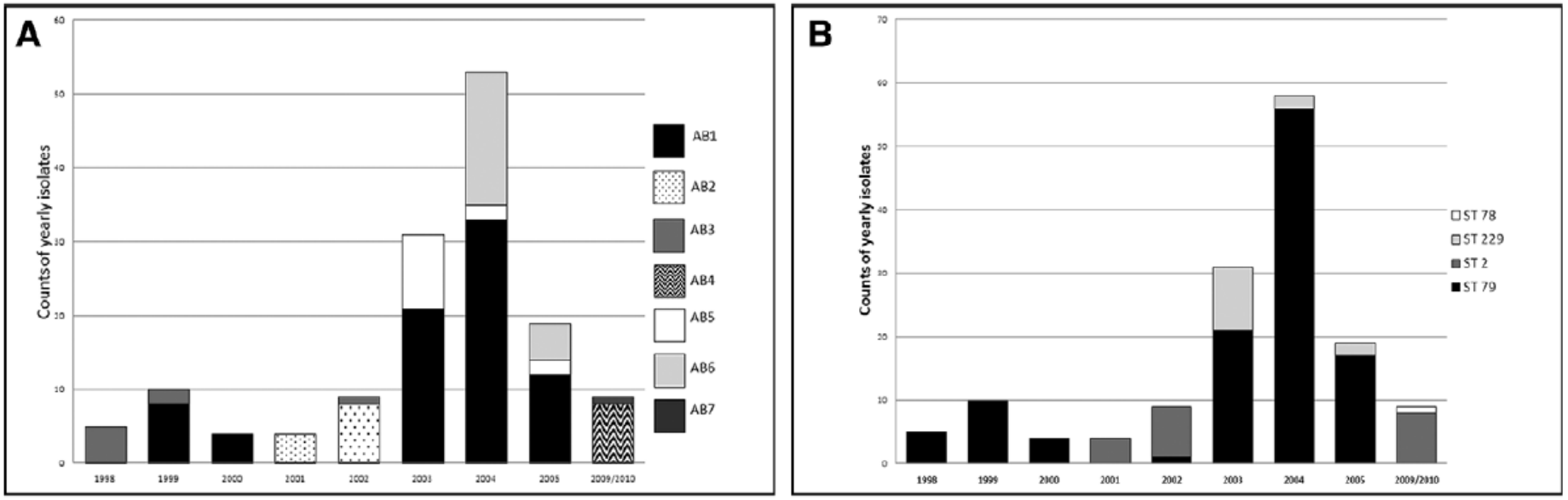
Dieciocho años de experiencia con *Acinetobacter baumannii* en un hospital de Miami, FL

L. Silvia Munoz-Price, MD[1,2,3,4]; Kristopher Arheart, EdD[2,5]; Patrice Nordmann, PhD[6]; Anne E. Boulanger[6]; Timothy Cleary[7]; Rebeca Alvarez, MD[2]; Louis Pizano, MD[8]; Nicholas Namias, MD[8]; Daniel H. Kett, MD[1]; Laurent Poirel, PhD[6]

Objective: To characterize the descriptive and molecular epidemiology of *Acinetobacter baumannii* in our hospital.
Design: Longitudinal analysis of electronic microbiology laboratory records and isolates.
Setting: A 1,500 bed public teaching hospital in the Miami area.
Patients: Consecutive patients with *A. baumannii* from January reaction and randomly amplified polymorphic DNA techniques. A total of 9,334 *A. baumannii* isolates were detected, of which 4,484 isolates (48%) were identified as first positive isolates per unique patient. Most of the burden of disease was located in the ICUs (odds ratio, 2.64 [95% CI, 2.17–3.22]; $p < 0.0001$) and in the adult wards (odds ratio, 3.867 [95% CI, 2.71–5.52]; $p < 0.0001$). Respi-

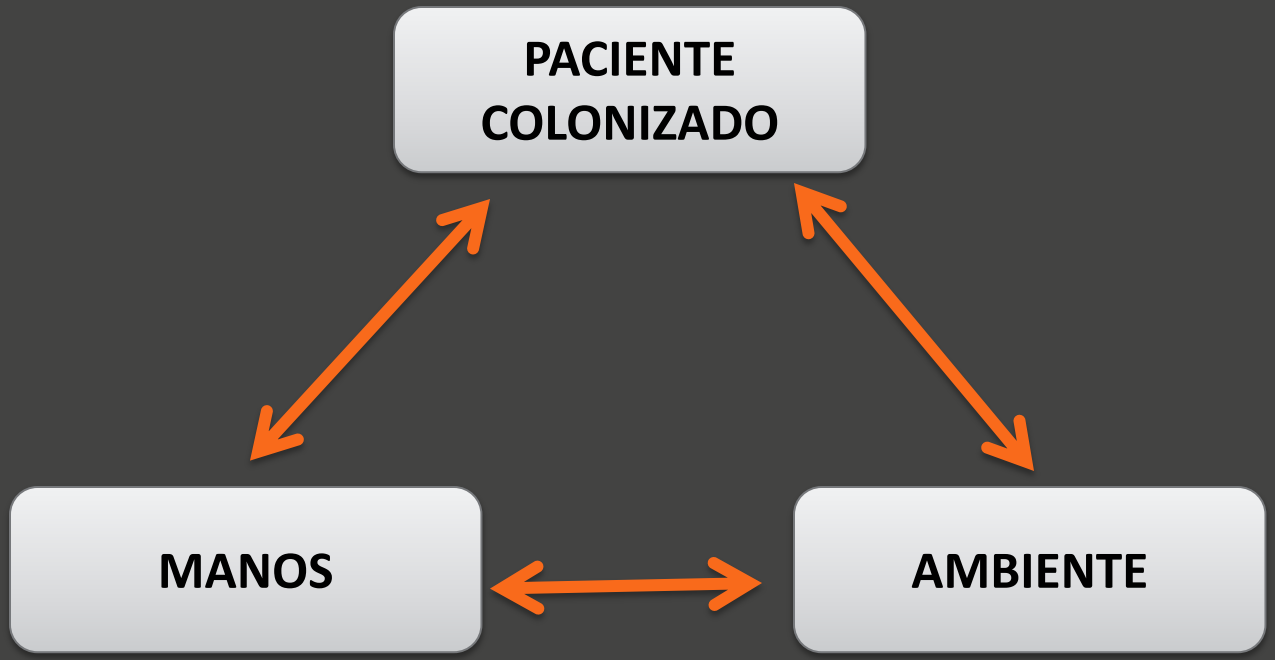

A
Yearly counts of first isolates
500
450
400
350
300
250
200
150
100
50
0
1994
1996
1998
2000
2002
2004
2006
2008
2010

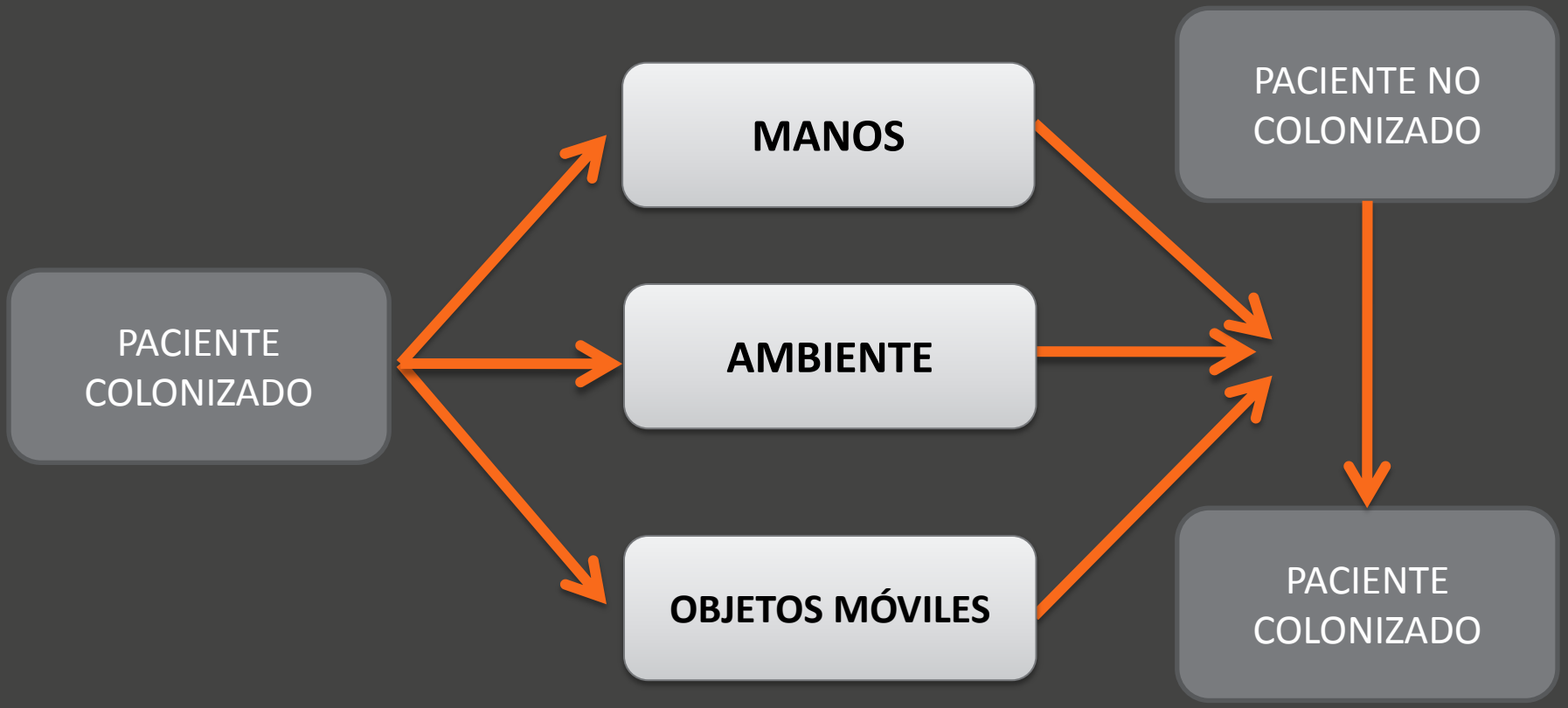

New Acquisitions of Carbapenem-resistant Acinetobacter (JMH)
Number of newly acquired imipenem-R Acinetobacters
0
2
4
6
8
10
12
14
1/8-1/14/11
1/22-1/28/11
2/5-2/11/11
2/19-2/25/11
3/19-3/25/11
4/2-4/8/11
4/16-4/22/11
4/30-5/6/11
5/14-5/20/11
5/28-6/3/11
6/11-6/17/11
6/25-7/1/11
7/9-7/15/11
7/23-7/29/11
8/6-8/12/11
8/20-8/26/11
9/3-9/9/11
9/17-9/23/11
10/1-10/7/11
10/15-10/21/11
10/29-11/4/11
11/12-11/18/11
11/26-12/2/11
12/10-12/16/11
12/24-12/30/11
1/7-1/13/12
Central 6
Other
SICU
NSICU
TICU
MICU


A
Countsof yearly isolates
0
10
20
30
40
50
60
1998
1999
2000
2001
2002
2003
2004
2005
2009/2010
AB1
AB2
AB3
AB4
AB5
AB6
AB7
B
Counts of yearly isolates
0
10
20
30
40
50
60
70
1998
1999
2000
2001
2002
2003
2004
2005
2009/2010
ST 78
ST 229
ST 2
ST 79

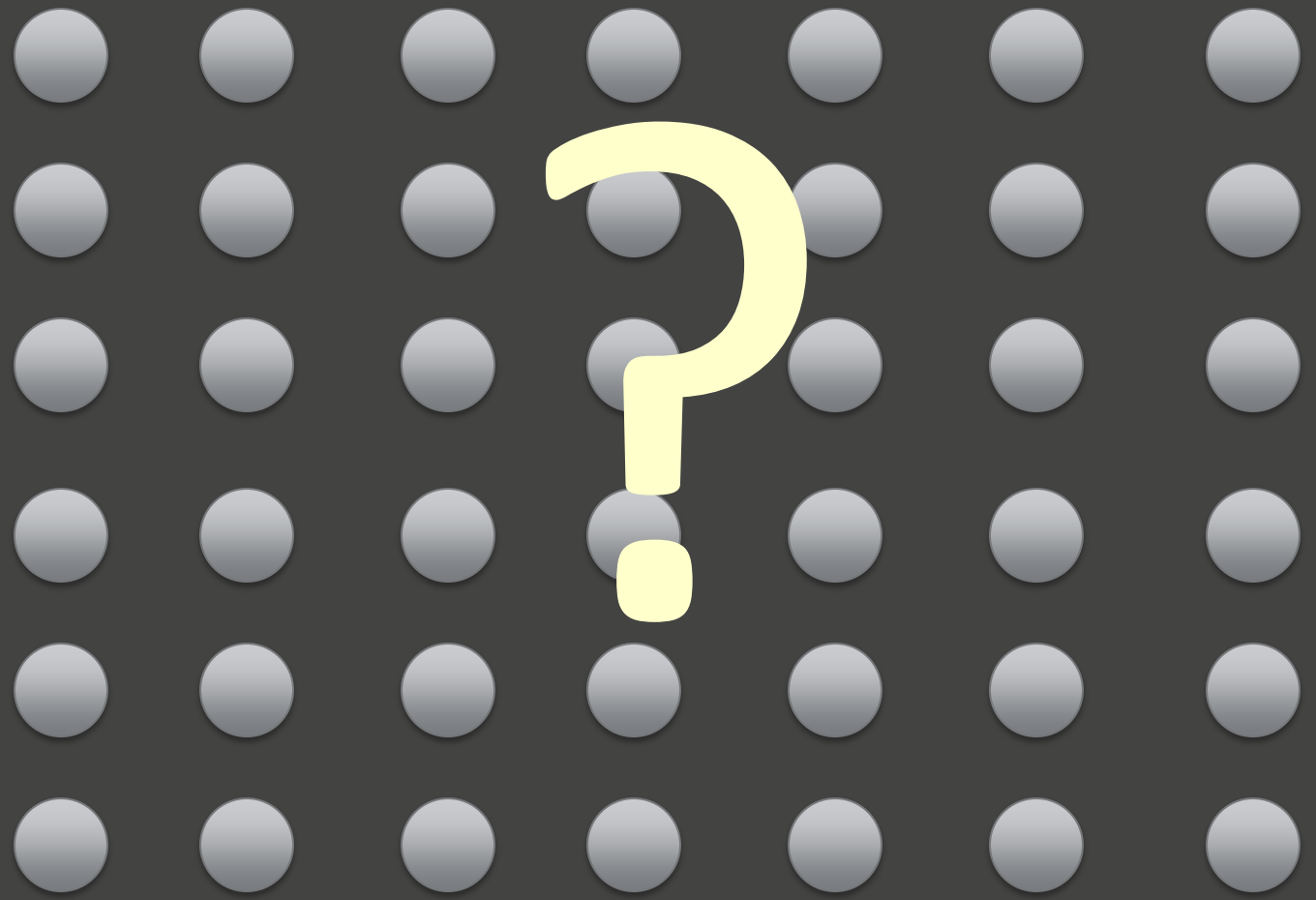
GRUPO DE INTERVENCIONES

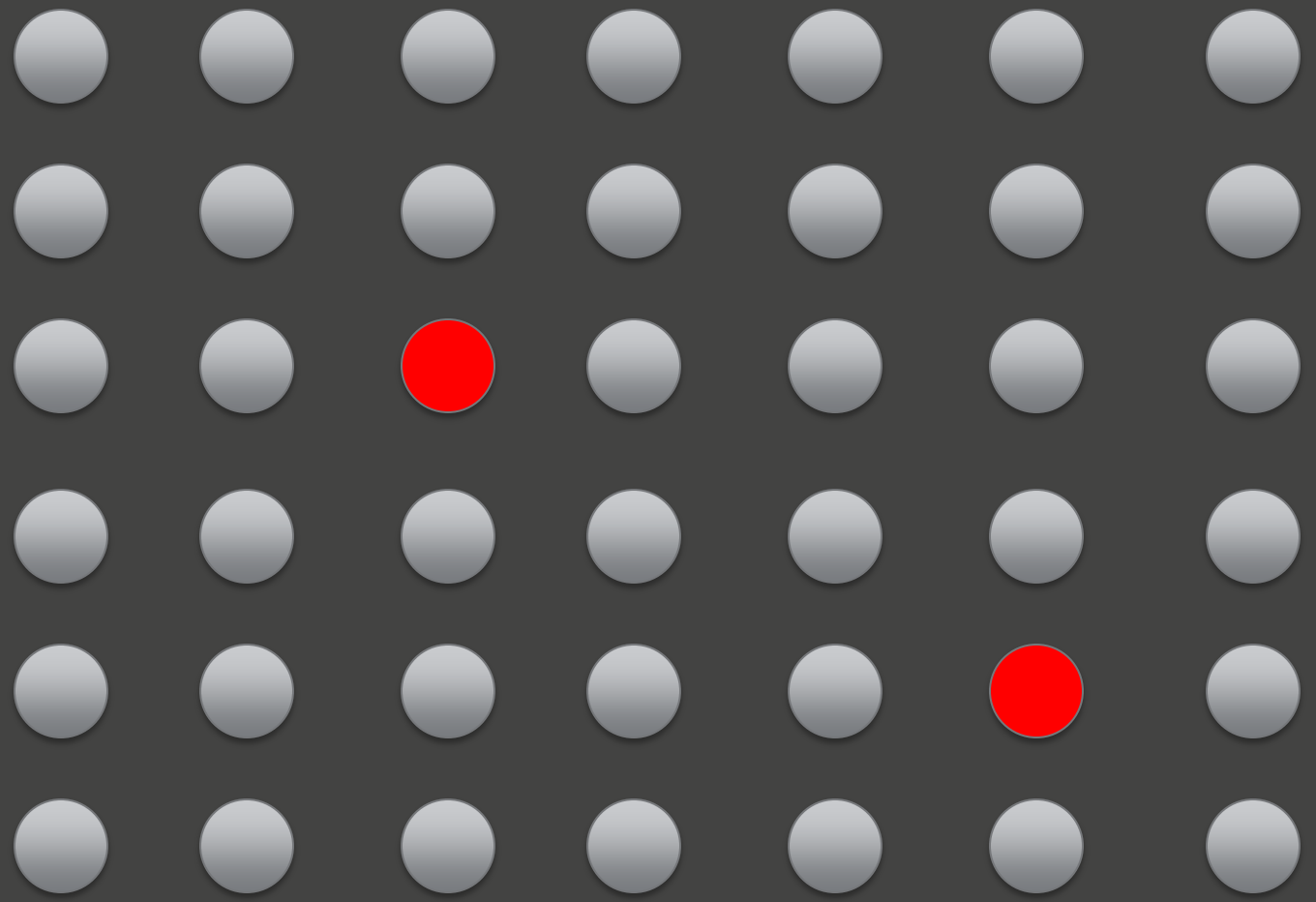

PACIENTE COLONIZADO
PACIENTE NO COLONIZADO

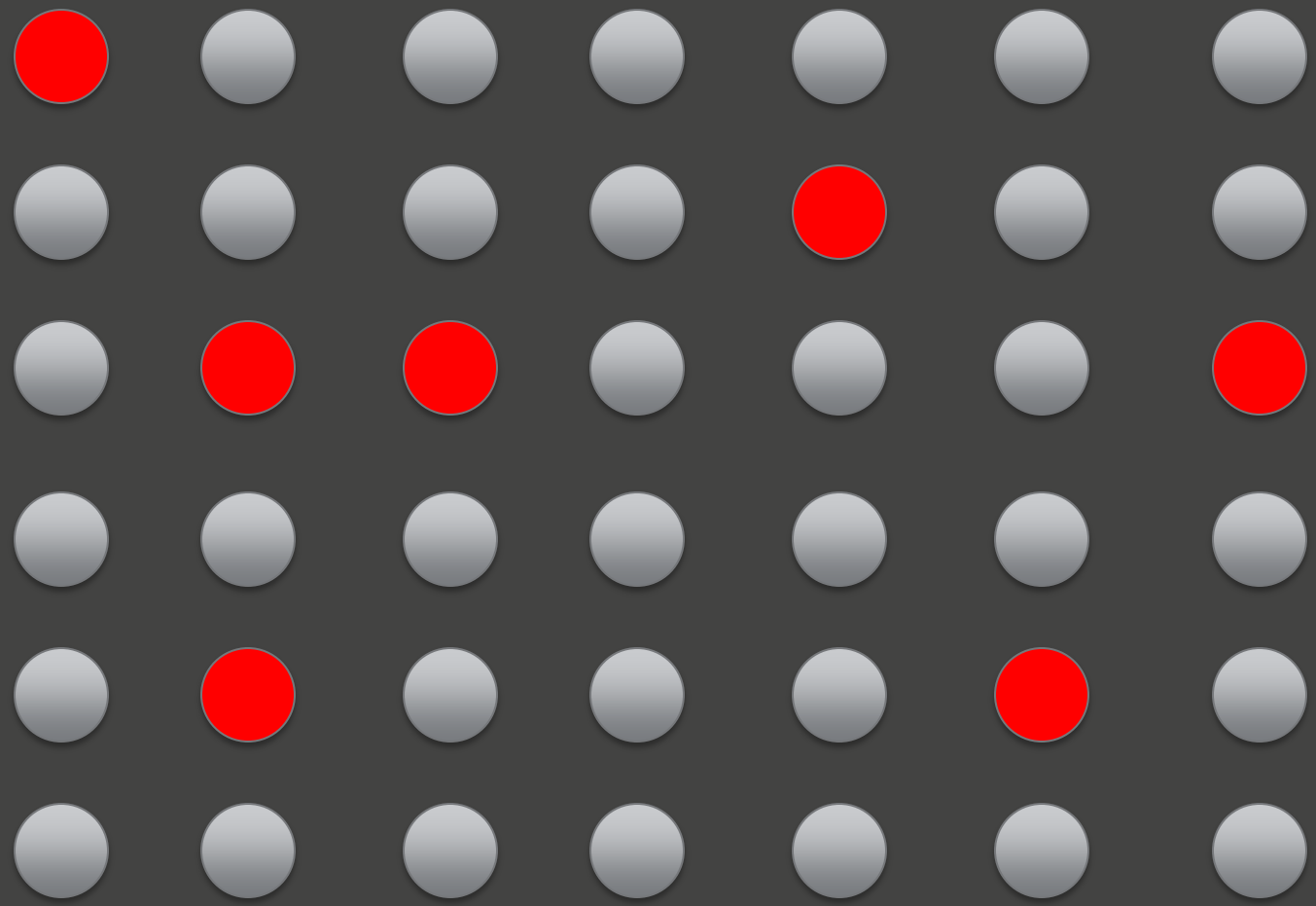

PACIENTE
COLONIZADO
MANOS
AMBIENTE

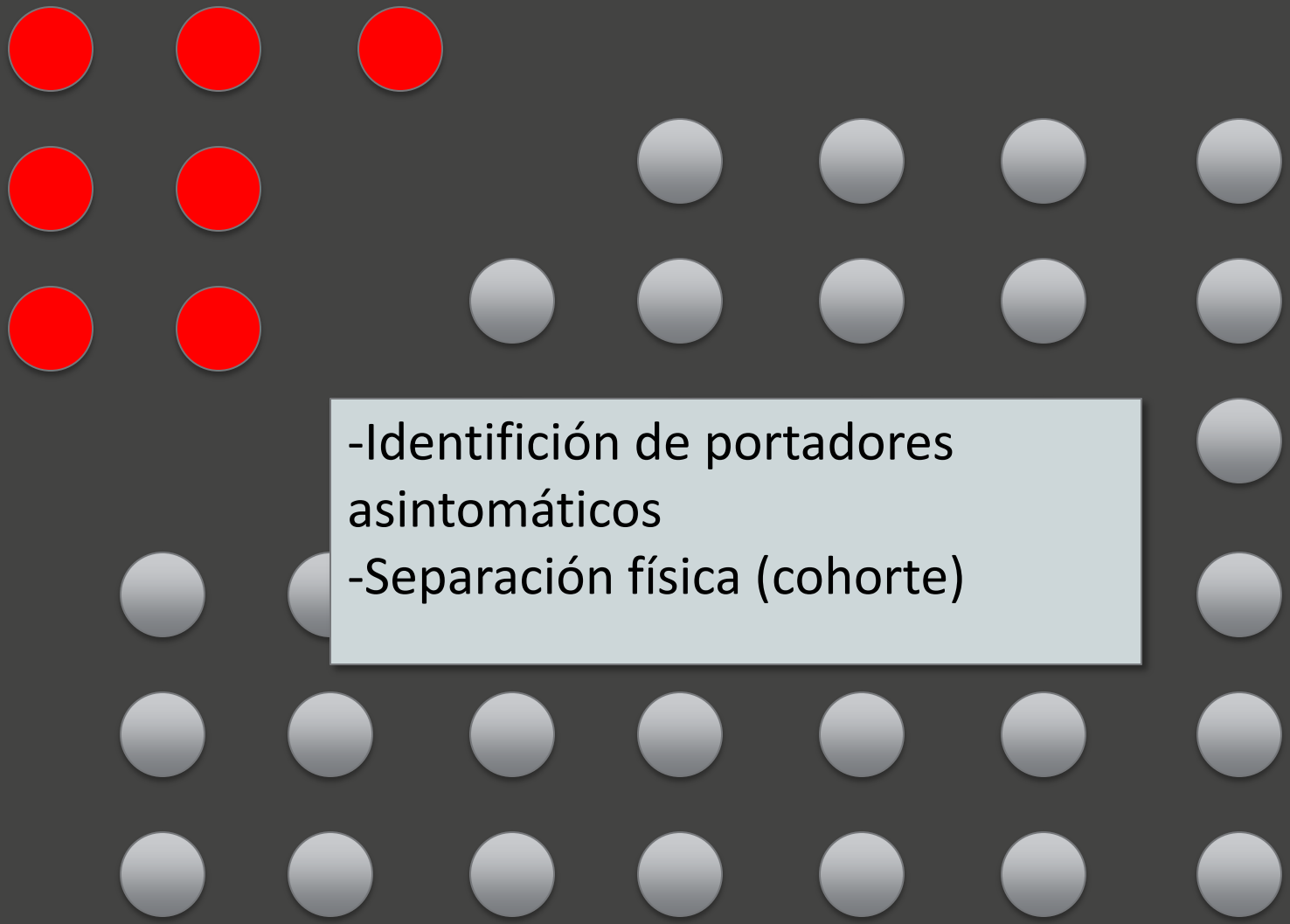

PACIENTE COLONIZADO
MANOS
AMBIENTE
OBJETOS MÓVILES
PACIENTE NO COLONIZADO
PACIENTE COLONIZADO

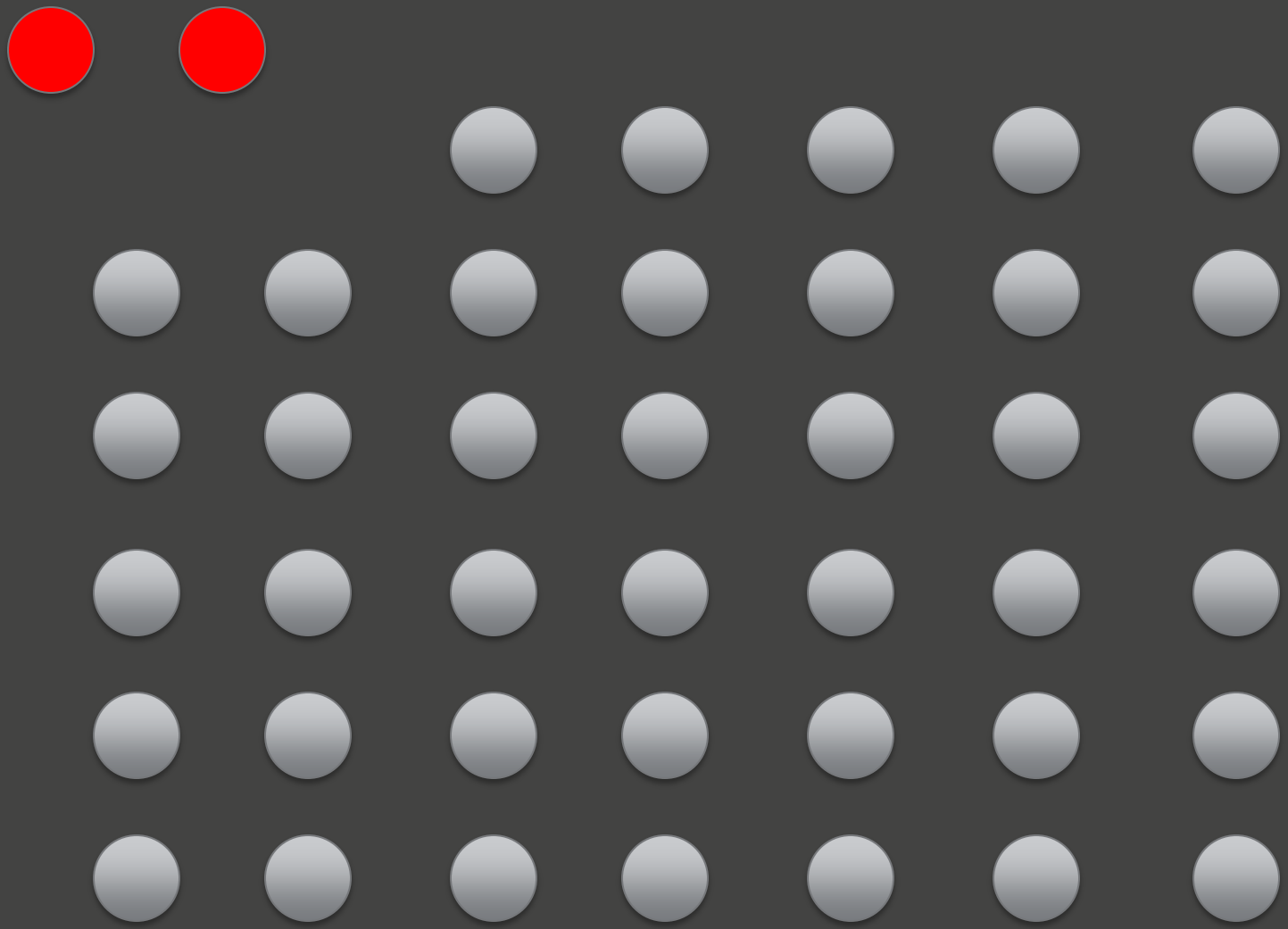
- Aumentar la distancia entre los pacientes
- Disminuir la contaminación de manos y ropas
- Aumentar la desinfección ambiental

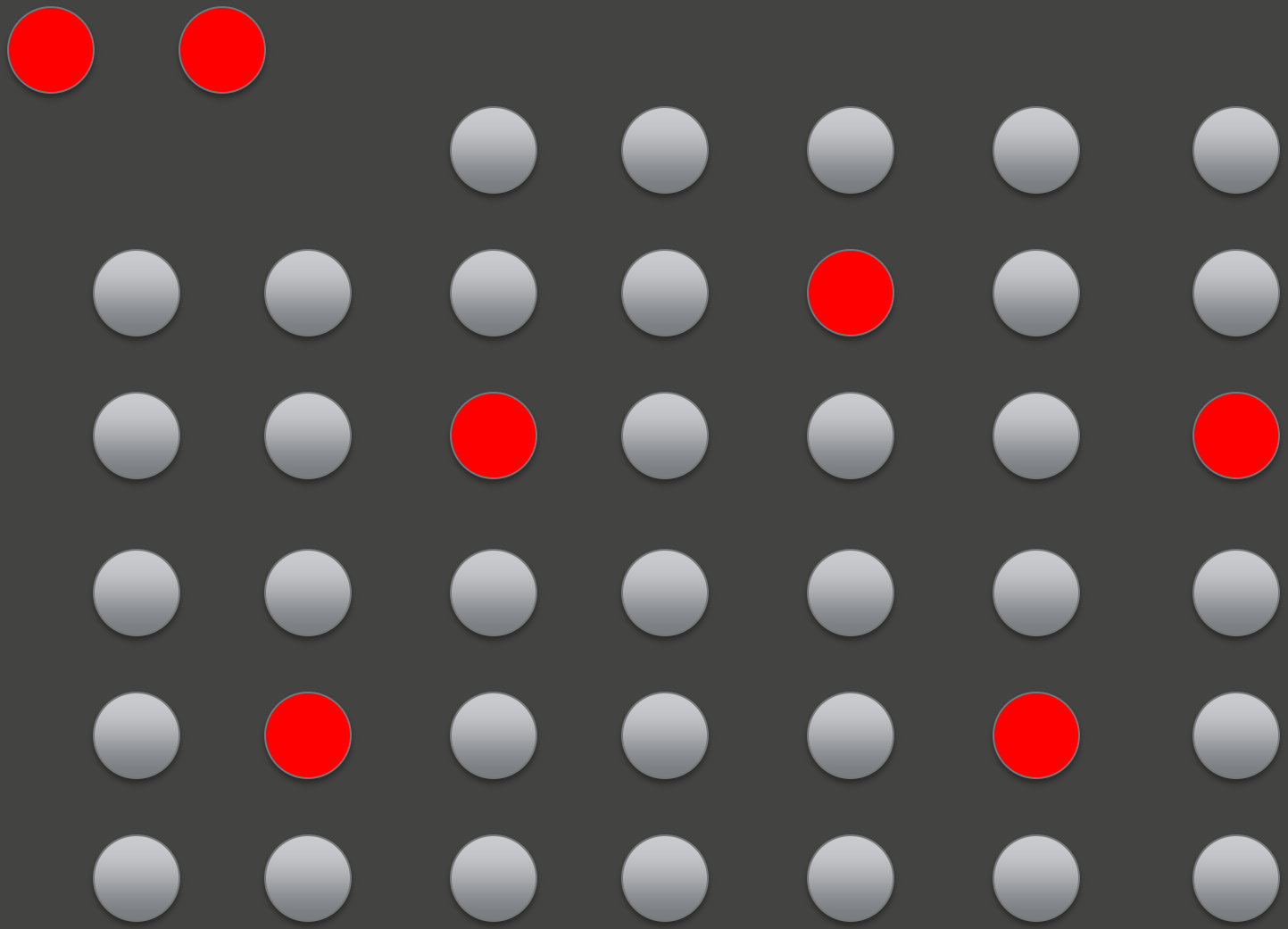


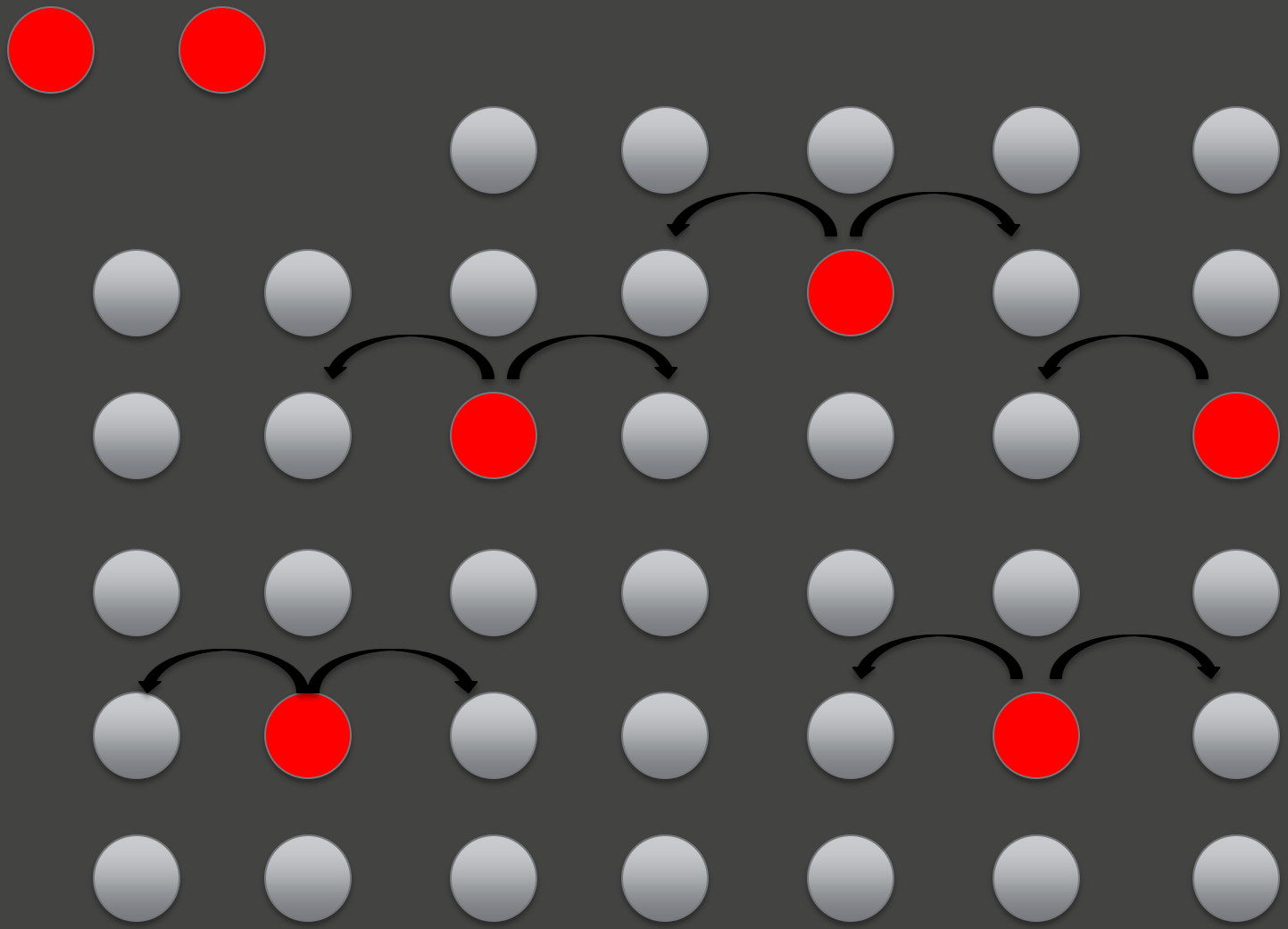




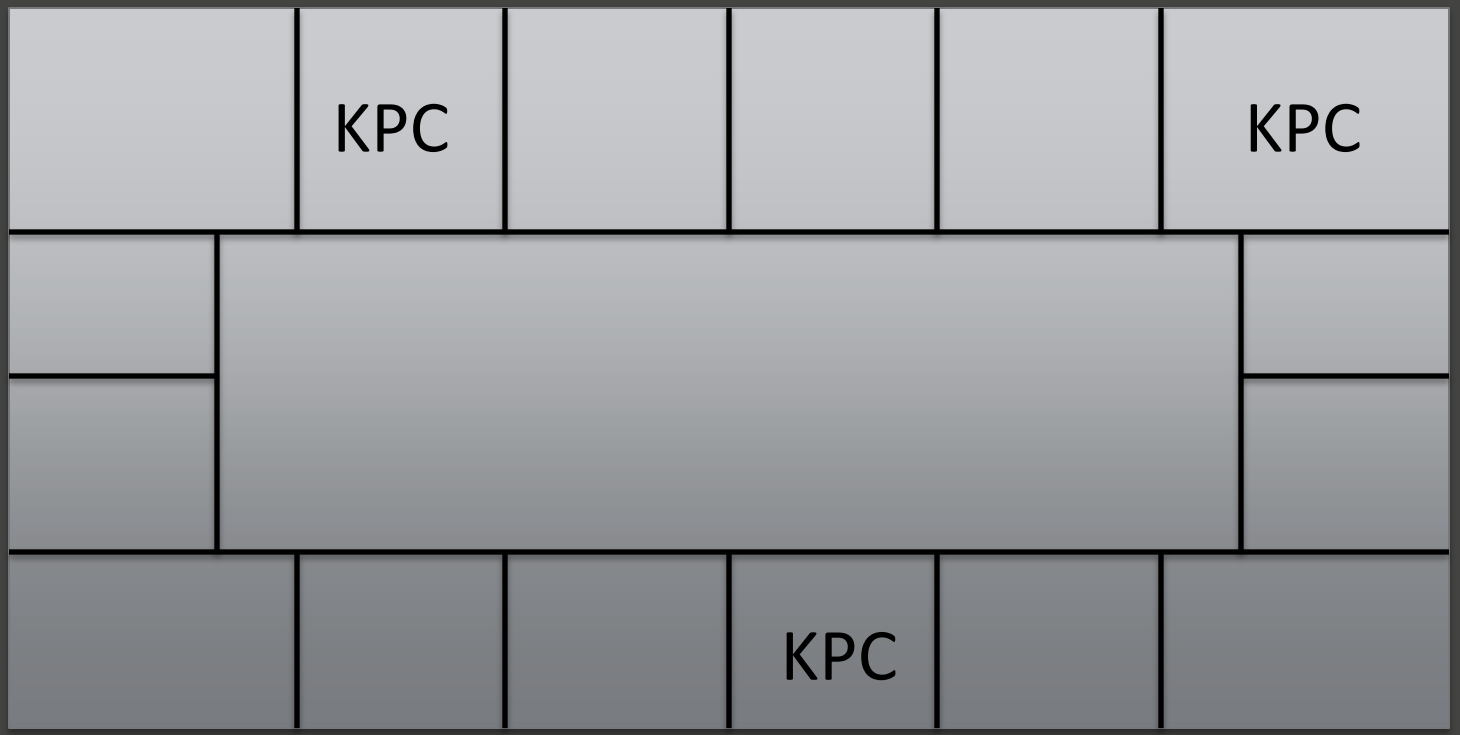

-Identifición de portadores asintomáticos
-Separación física (cohorte)

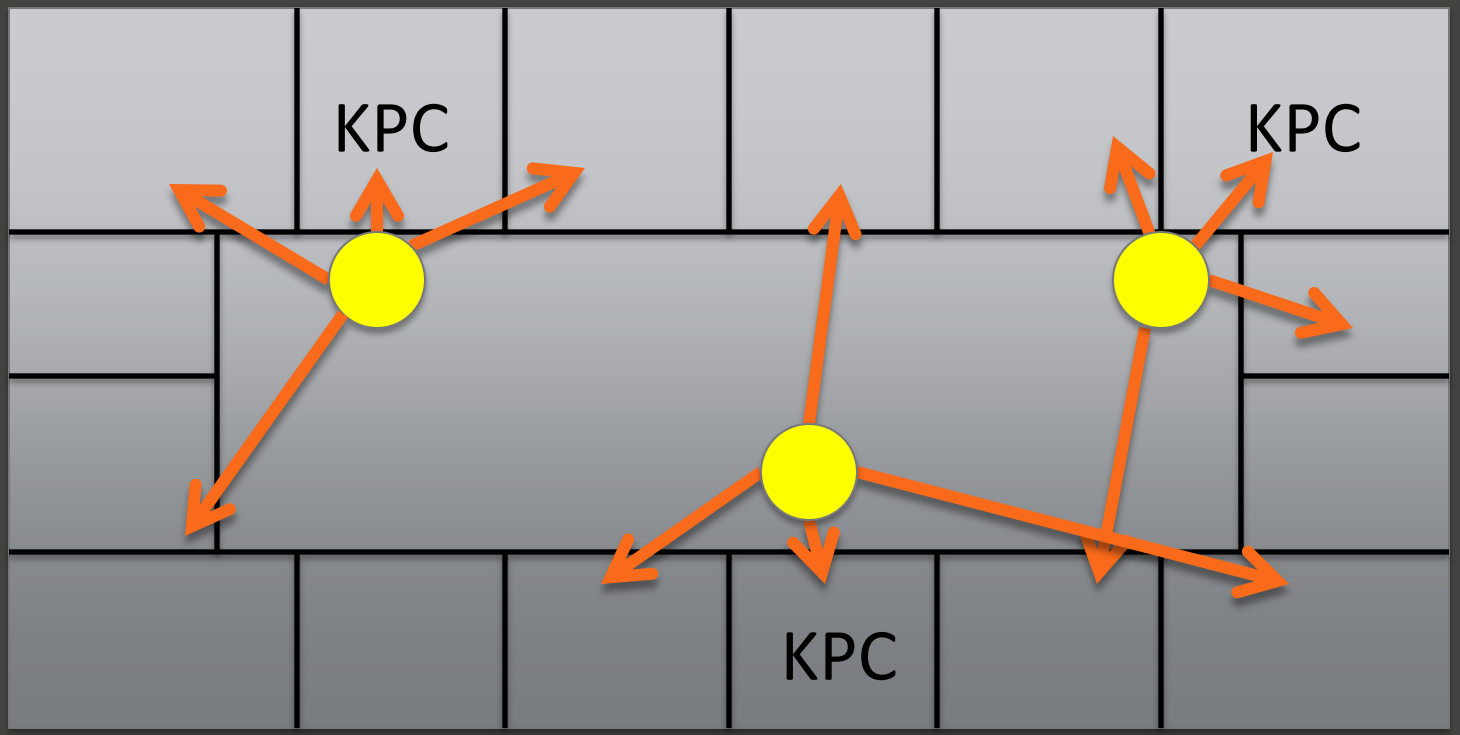







Estación de Enfermería


KPC
KPC
KPC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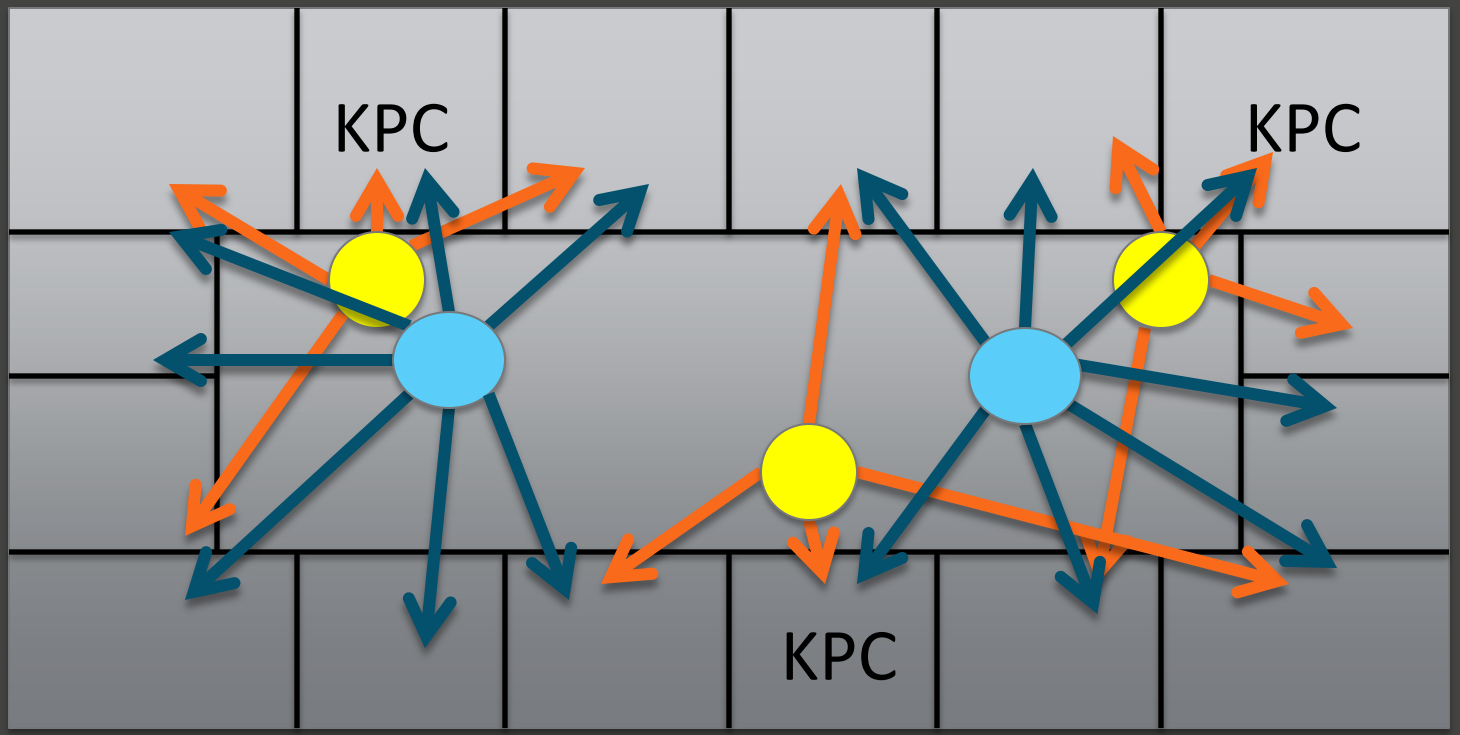
KPC
KPC
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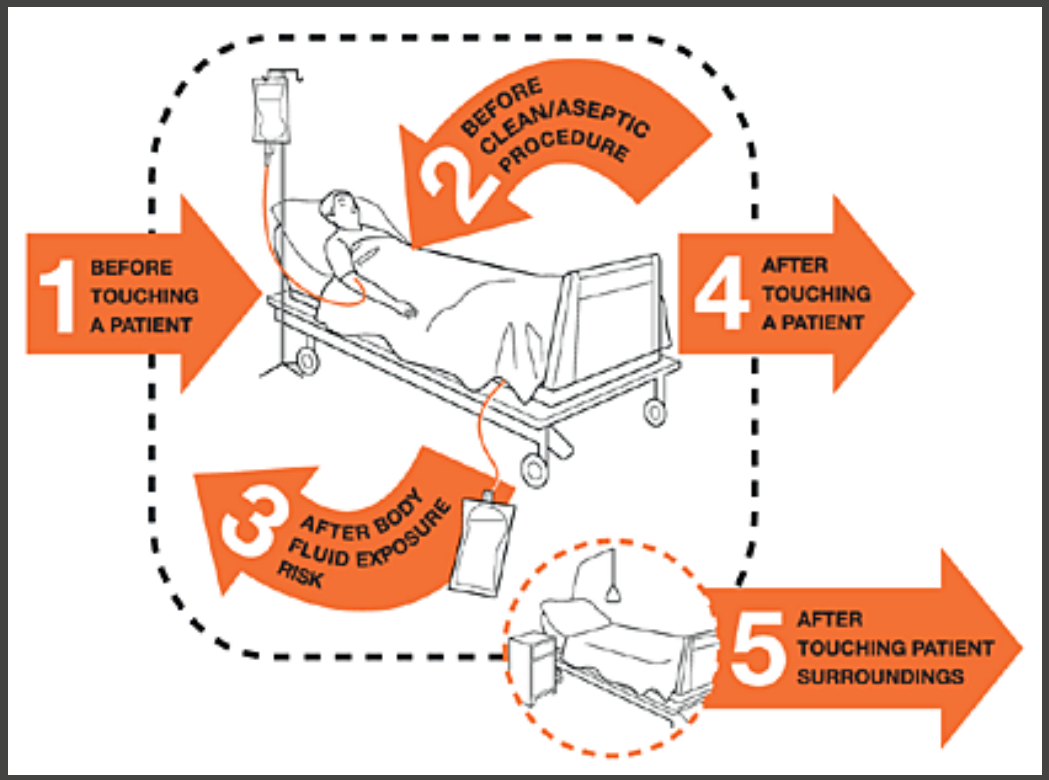
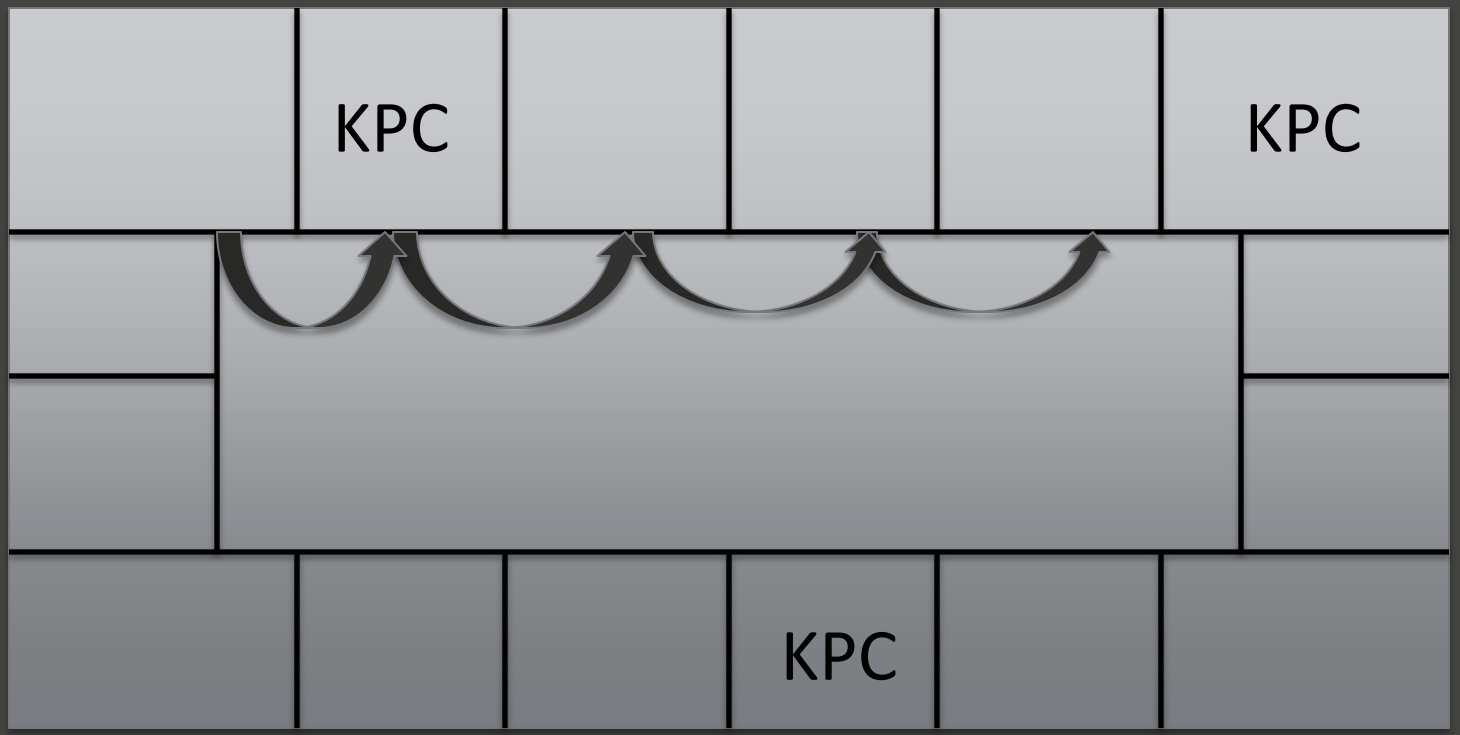
En la forma ideal

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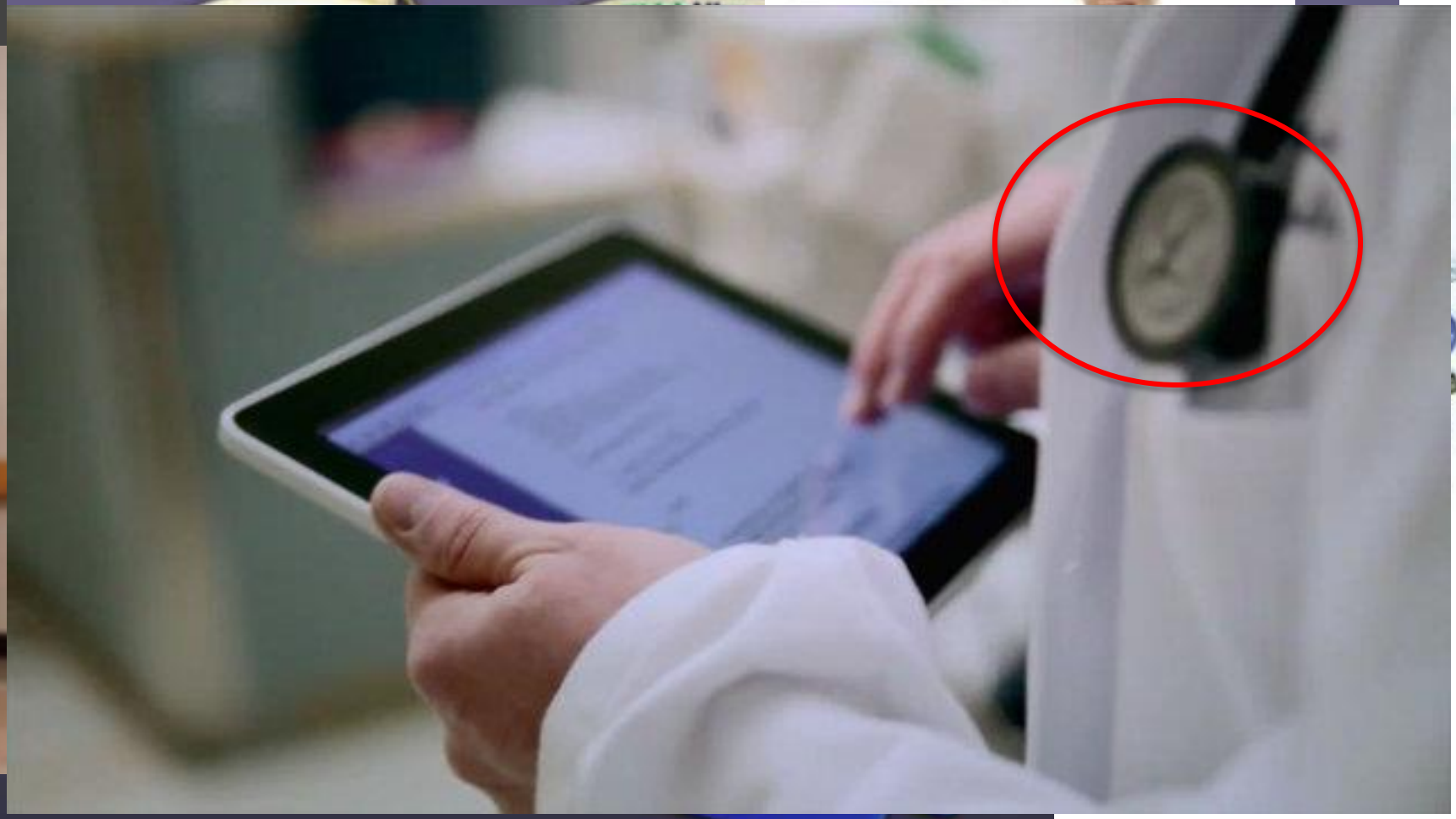

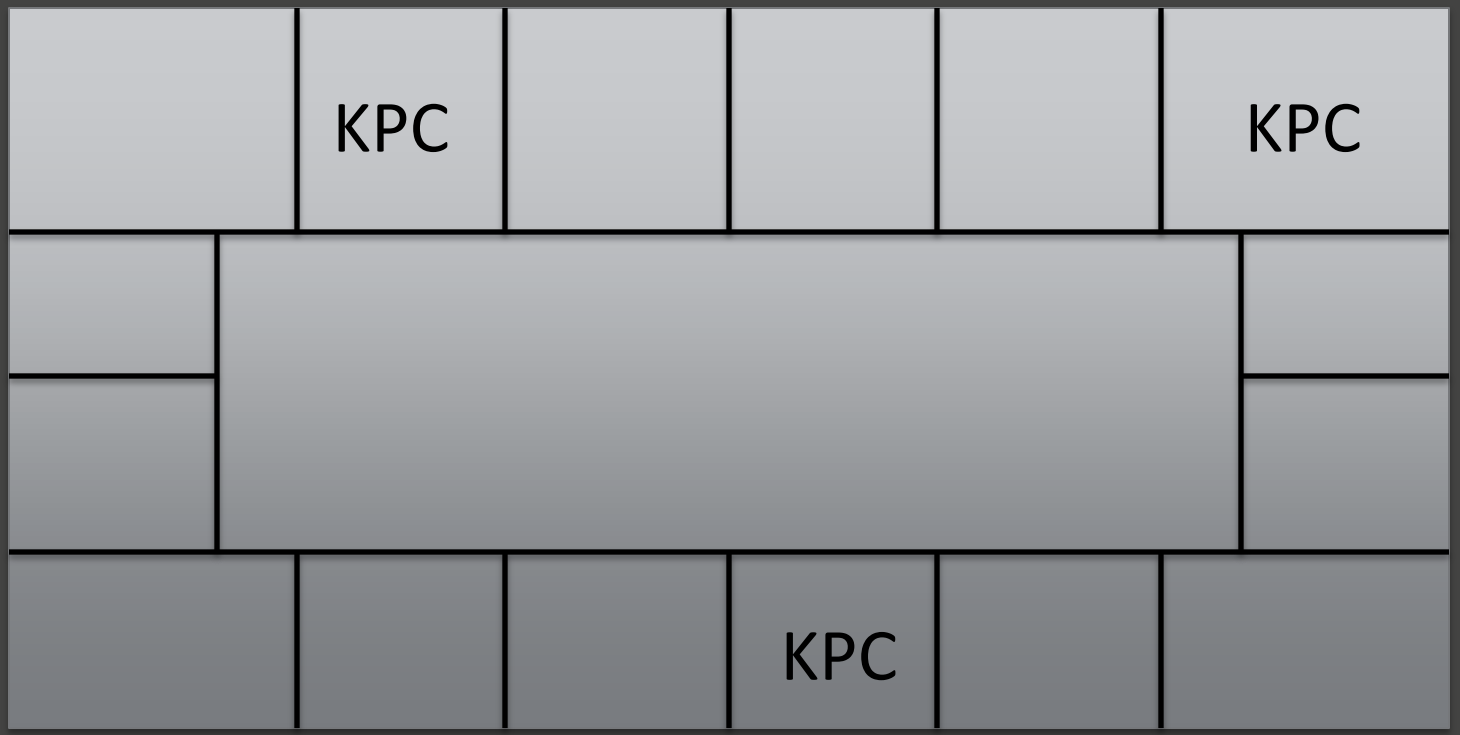
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KPC
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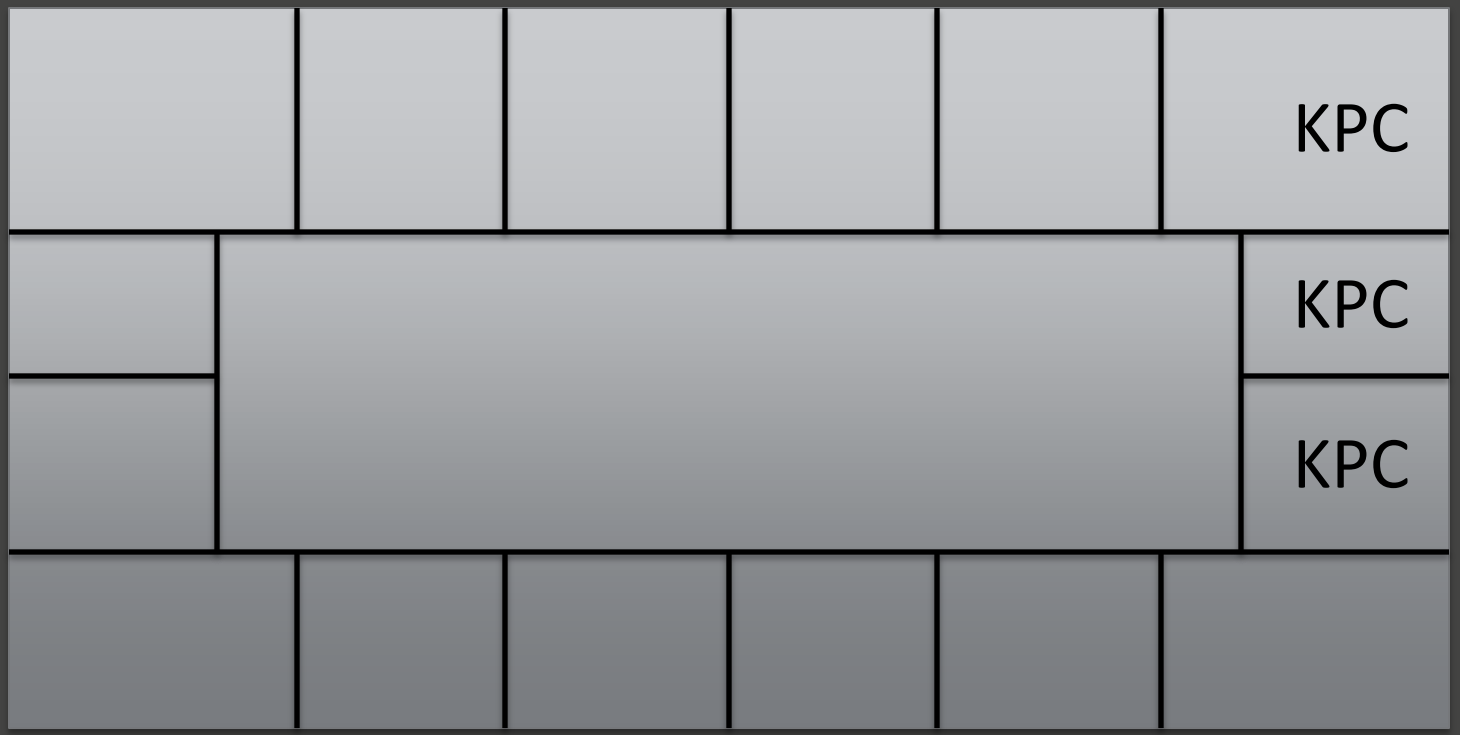
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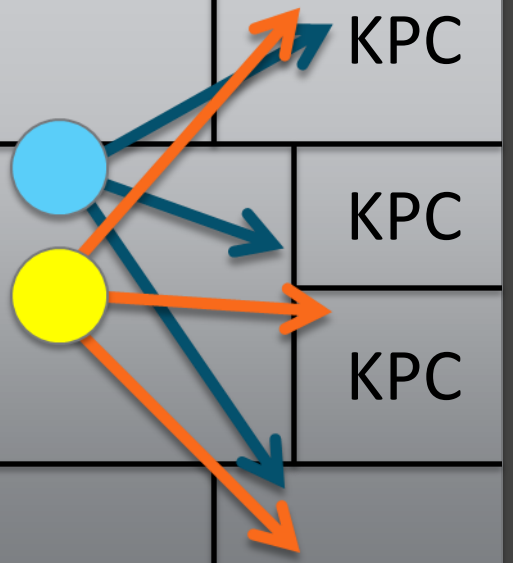
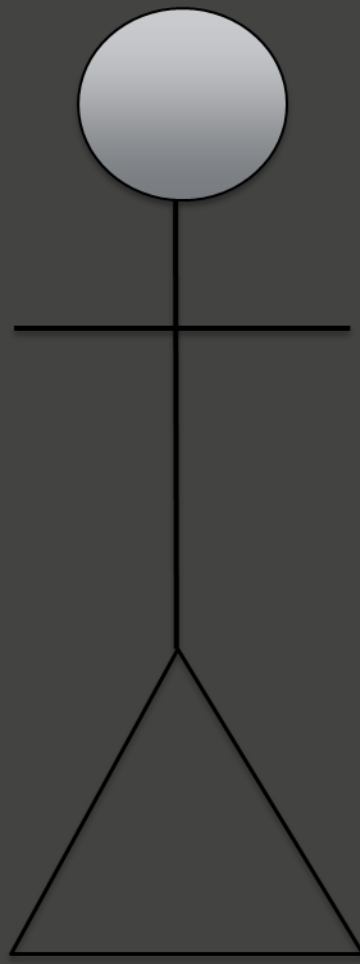
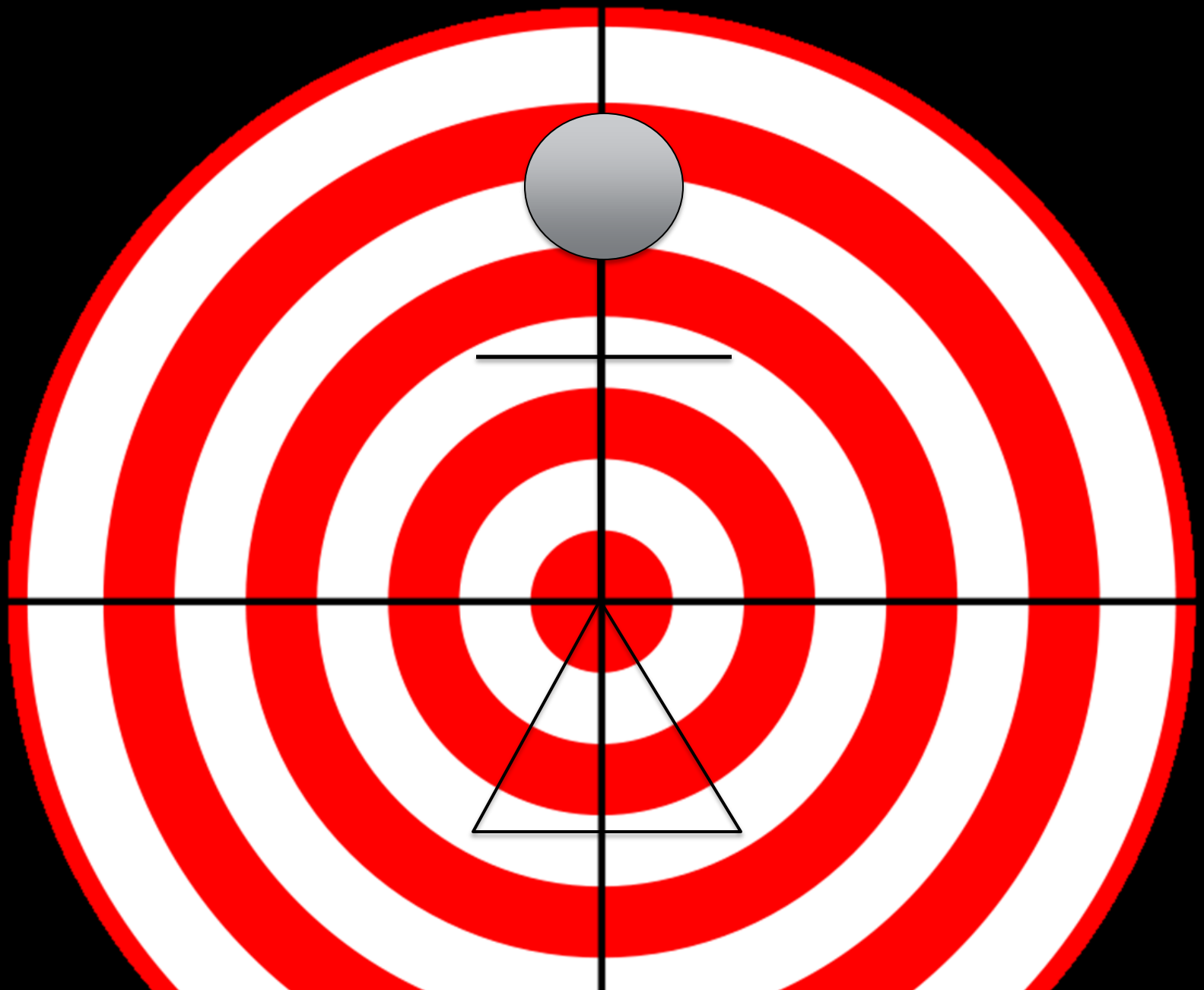
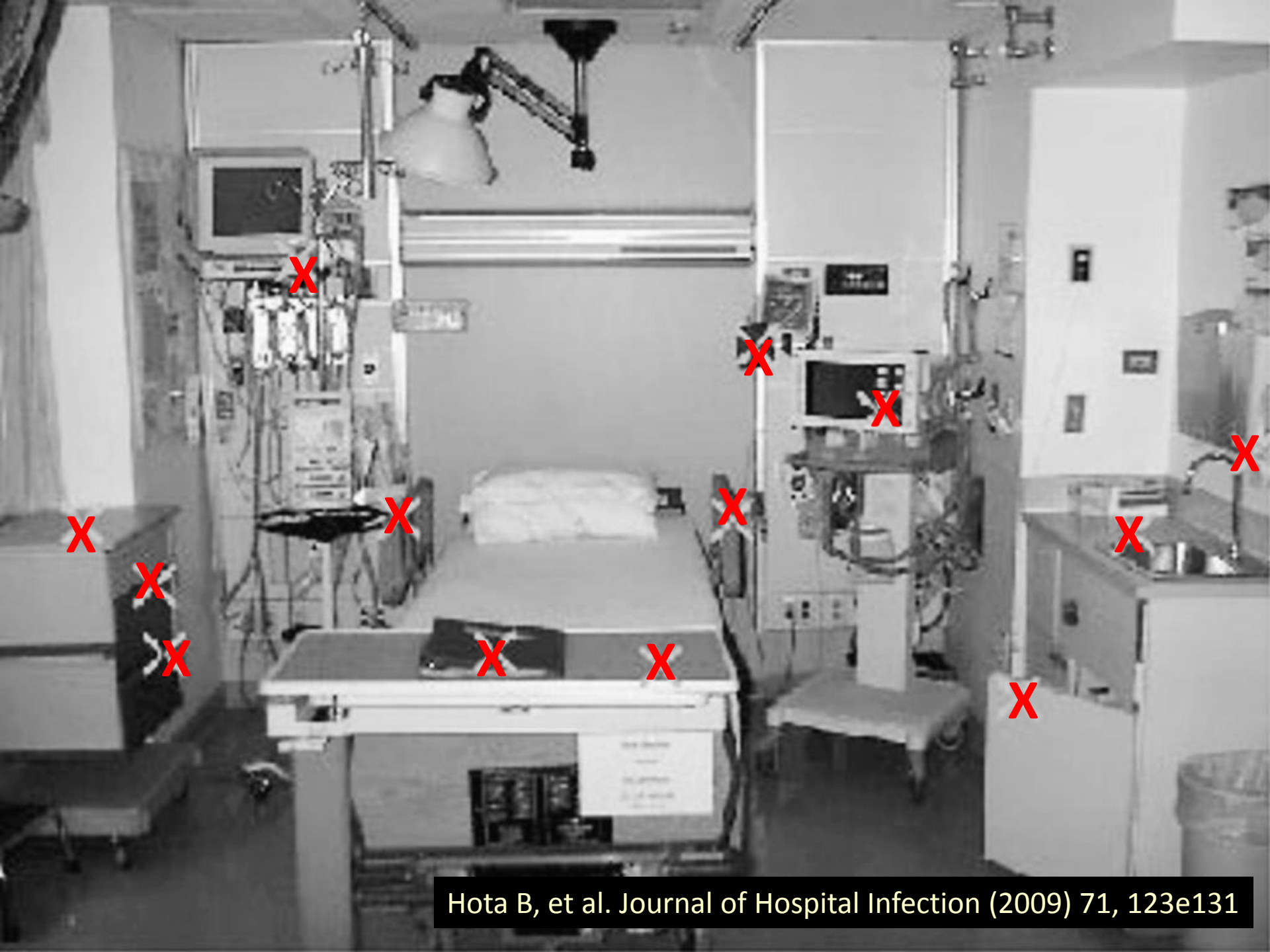

KPC
KPC
KPC

Patina Fecal

RA Weinstein. Crit Care Med 2012 Apr;40(4):1333-4






Hota B, et al. Journal of Hospital Infection (2009) 71, 123e131

JOURNAL OF CLINICAL MICROBIOLOGY, Jan. 2011, p. 154–158 Vol. 49, No. 1
0095-1137/11/$12.00 doi:10.1128/JCM.01043-10

Screening for *Acinetobacter baumannii* Colonization by Use of Sponges[▽]

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Division of Infectious Diseases,[1] Clinical Microbiology Laboratory,[3] and Department of Infection Control,[4] University of Pittsburgh Medical Center, Pittsburgh, Pennsylvania, and Department of Epidemiology[2] and Infectious Diseases Epidemiology Research Unit,[5] University of Pittsburgh Graduate School of Public Health, Pittsburgh, Pennsylvania

Received 24 May 2010/Returned for modification 8 October 2010/Accepted 21 October 2010

(A) (B)

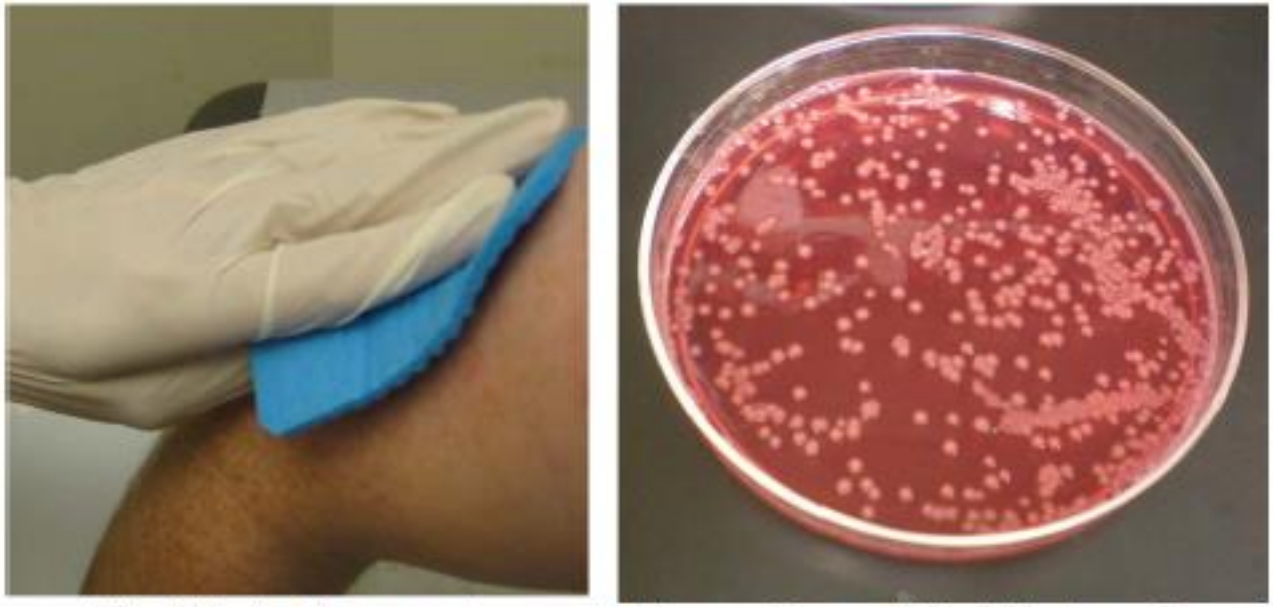
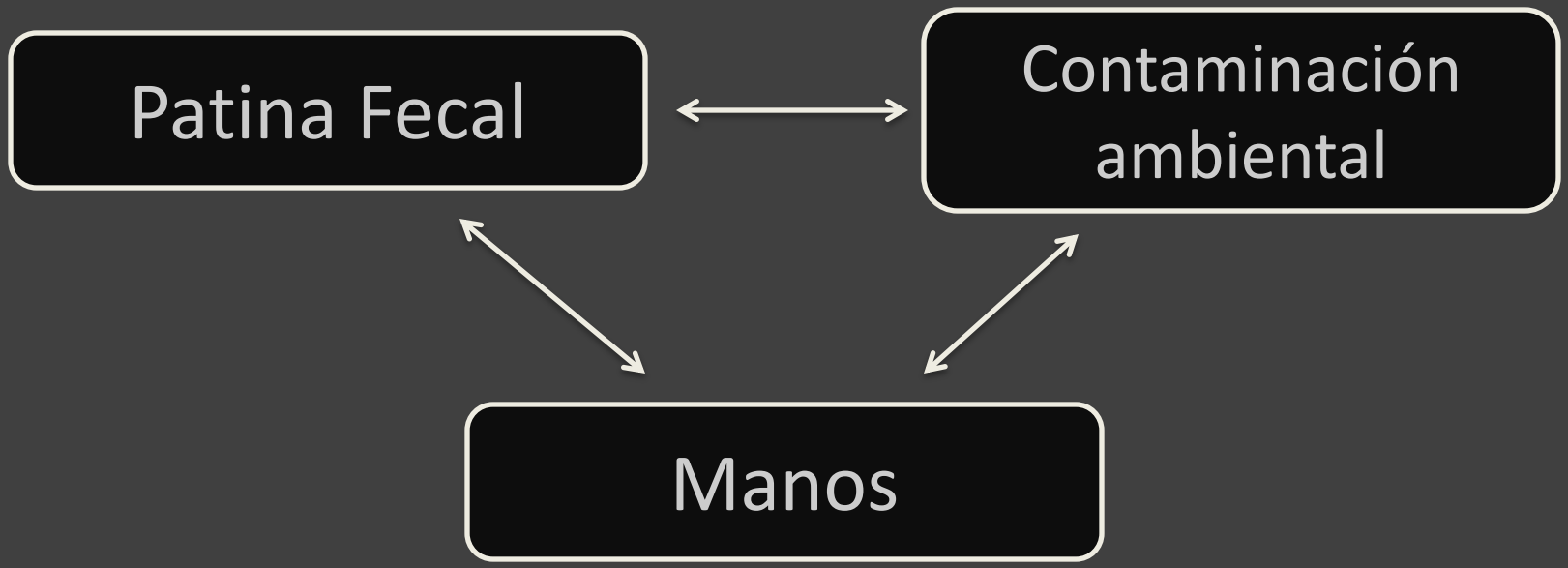
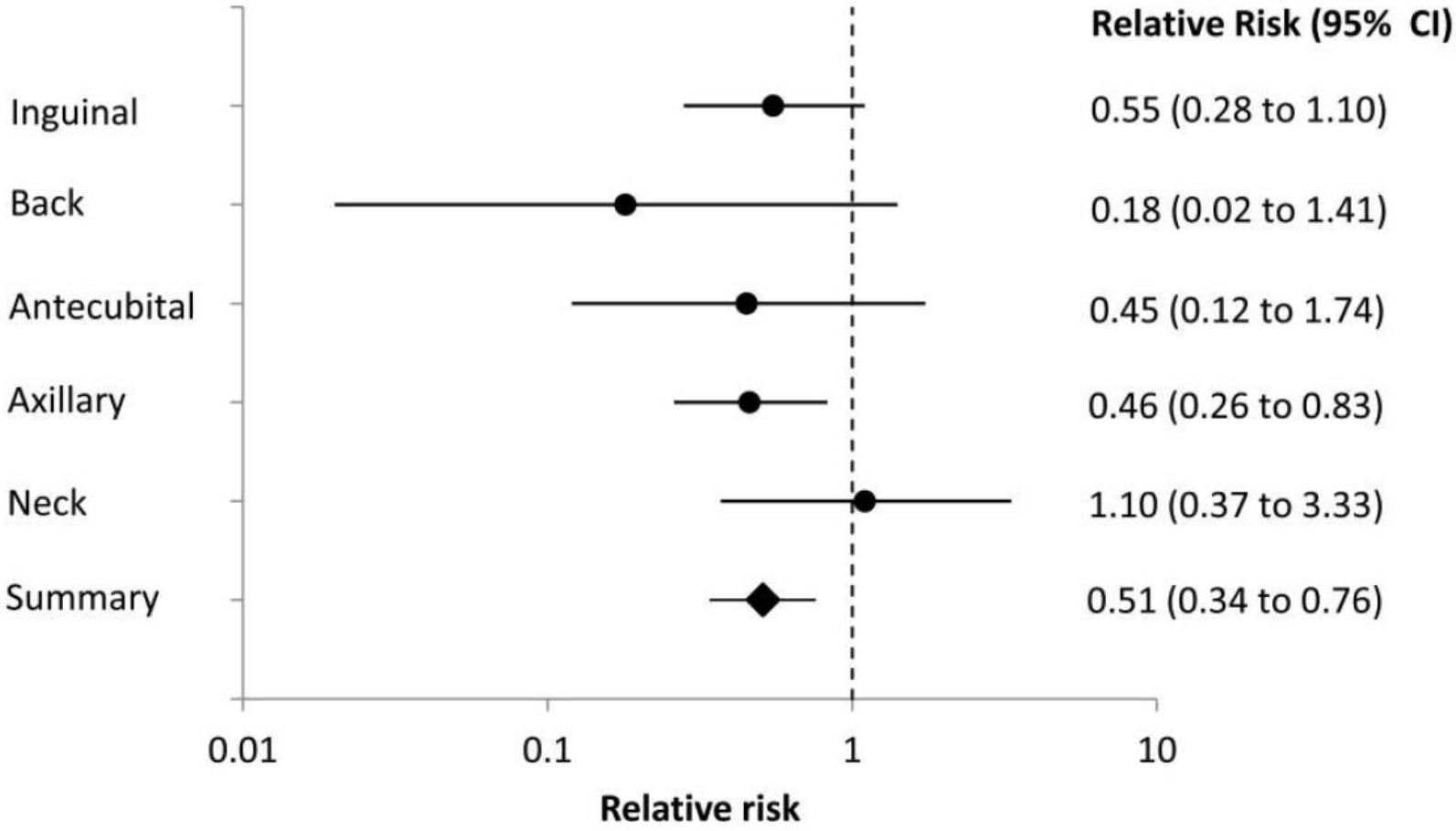


FIG. 1. (A) Sampling of the upper arm using a sponge. (B) *A. baumannii* colonies on modified Leeds Acinetobacter medium.


Patina Fecal
Contaminación ambiental
Manos

Aplicación de clorhexidina

- Aplicación diaria
- No enjuagarlo
- No combinar con otros jabones



Lin M, et al. ICHE April 2014

LOS PROBLEMAS CON CLORHEXIDINA

DESINFECCIÓN AMBIENTAL

LOS CUARTOS SON LIMPIADOS DIARIAMENTE?

USO DE MARCADORES FLUORESCENTES PARA MEJORAR LA LIMPIEZA DE CUARTOS

Philip C. Carling,[1,2,3,4] Janet L. Briggs,[1] Jeanette Perkins,[3] and Deborah Highlander[4]

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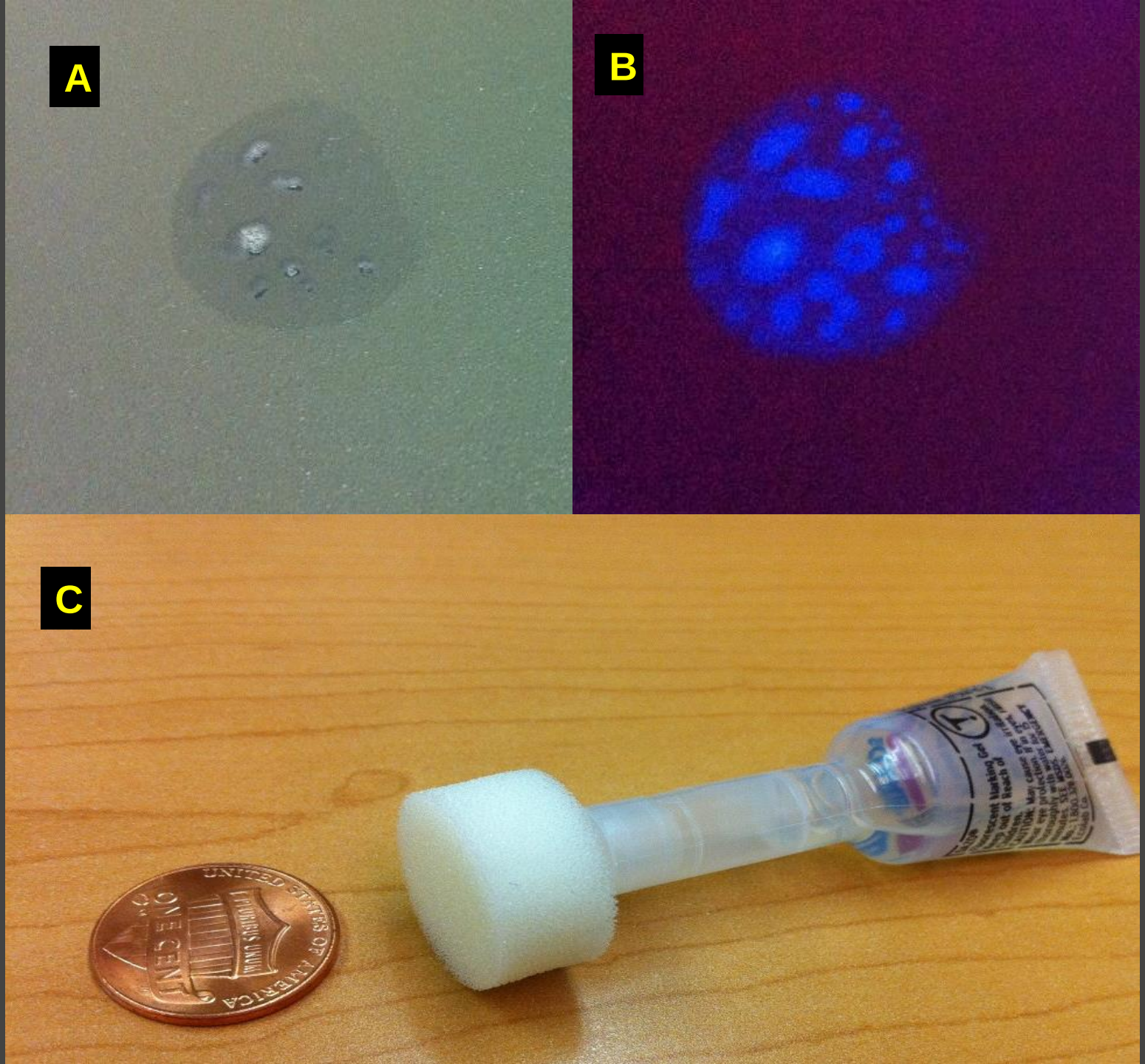
We developed a new method using an invisible fluorescent marker to target standardized high-touch surfaces in hospital rooms. Evaluation of 1404 surface objects in 157 rooms in 3 hospitals revealed that 47% of targets had been cleaned.

gical beds and 15 intensive care unit beds, and hospital B had 154 medical/surgical beds and 14 intensive care unit beds. The administrative, clinical, and housekeeping staffs of the 2 hospitals were completely independent. The third hospital was an acute care, short-term rehabilitation hospital. During the study, staff levels of environmental services remained stable at all hospitals, as did the time allocated for patient-room cleaning activities.

A viscous, translucent targeting solution was formulated using a stable, nontoxic base, to which was added a chemical marker that fluoresces under black light. The material is inconspicuous, dries rapidly on surfaces, and remains stable for several weeks. Approximately 0.2 mL of solution was applied to 12 standardized sites in each room to create well-circumscribed targets with diameters of ~1.5 cm (figure 1). These sites

igure 1. The manner in which a target is made visible on a bedside telephone, using a portable black light

Clinical Infectious Diseases 2006; 42:385–8


A
B
C
ONE CENT
UNITED STATES OF AMERICA
LIBERTY
IN GOD WE TRUST

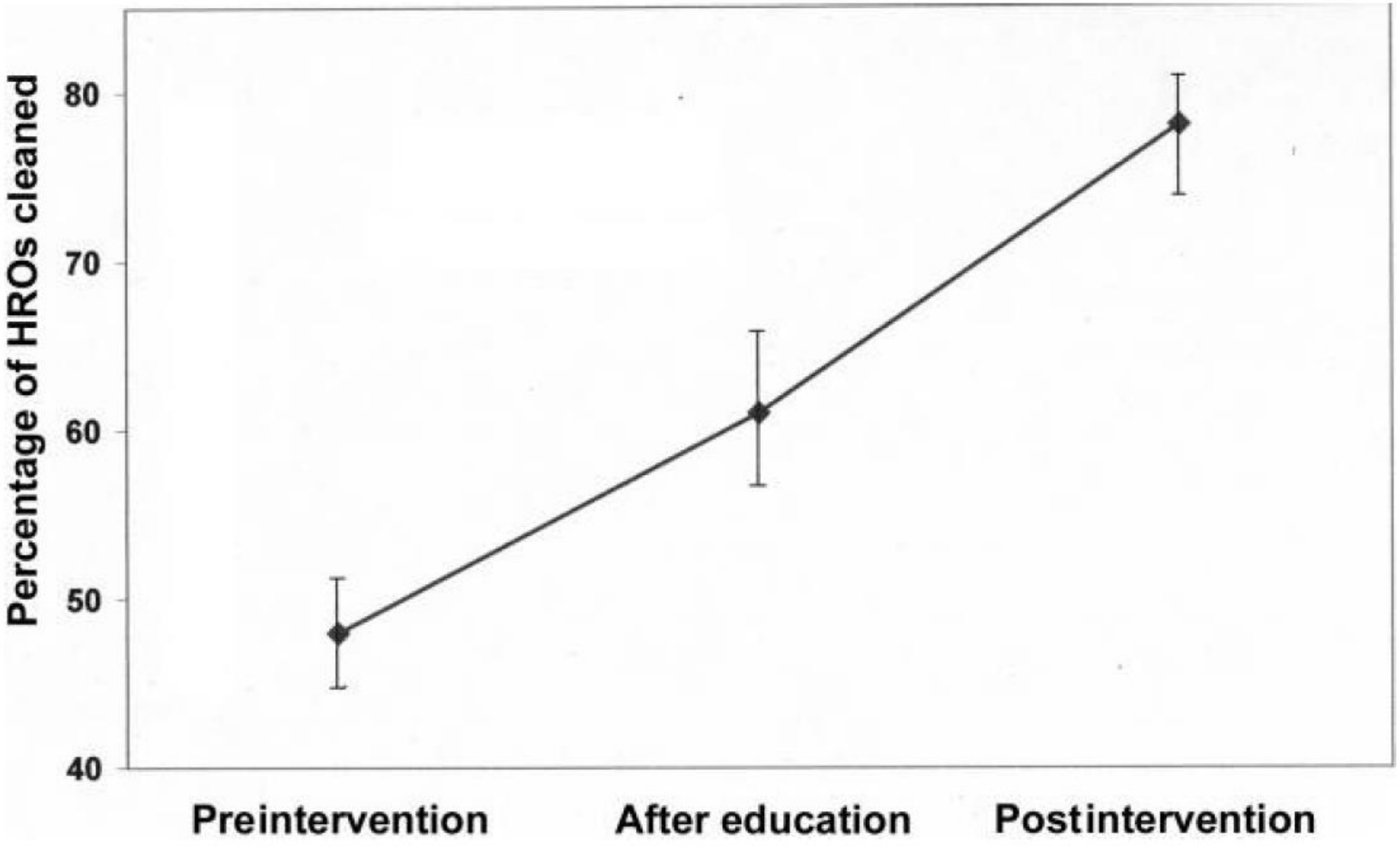


FIGURE 2. Change in the mean rate of environmental cleaning in the 36 study hospitals during the 3 phases of the study. HROs, high-risk objects; *whiskers*, 95% confidence intervals.

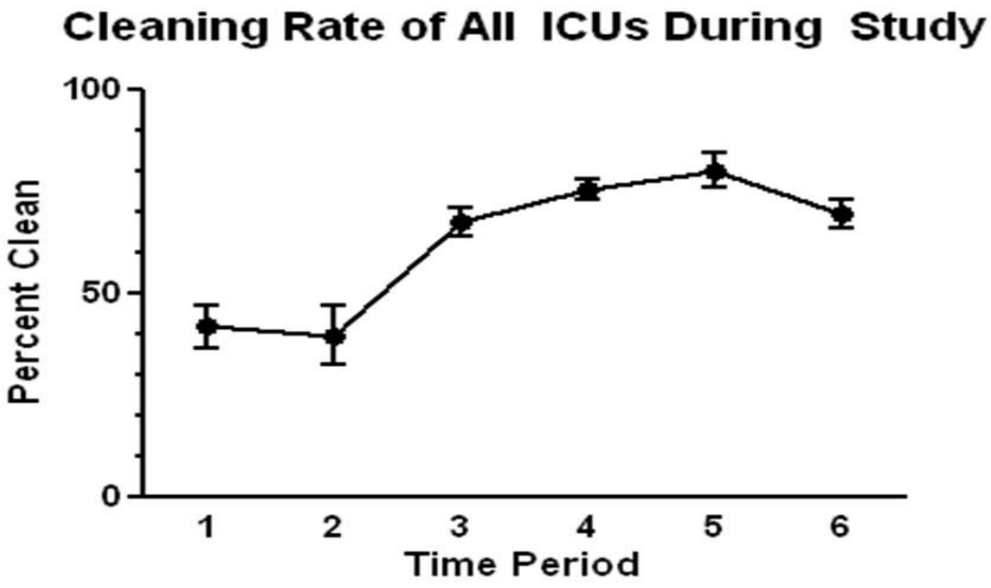
INFECTION CONTROL AND HOSPITAL EPIDEMIOLOGY MARCH 2011, VOL. 32, NO. 3

CONCISE COMMUNICATION

USO DE POLVO FLUORESCENTE PARA MEJORAR LA LIMPIEZA DE CUARTOS

L. Silvia Munoz-Price, MD;[1,2] Ella Ariza-Heredia, MD;[1,2]
Stephen Adams, RN;[2] Micheline Olivier, RN;[2]
Lisa Francois, RN;[2] Maria Socarras, RN;[2]
Gabriel Coro, RN;[2] Amos Adedokun, RN;[2]
Theodora Pappas, RN;[2] Madelaine Tamayo, RN;[2]
Regina McDade, RN;[2] Cameron Dezfulian, MD

panels, commodes, sinks, room computer keyboards, storage cabinet handles, and light switches. Nine infection preventionists applied UV powder to high-risk objects by using cotton swabs to cover completely an area of approximately 2.54 cm^2. This fine white powder is not readily visible to the naked eye but is readily detected using UV lamps (GlitterBug) 48 hours later. Surfaces were classified as dirty if UV powder was found untouched and clean if there was an obvious attempt to remove the UV powder (eg, to clean), especially on

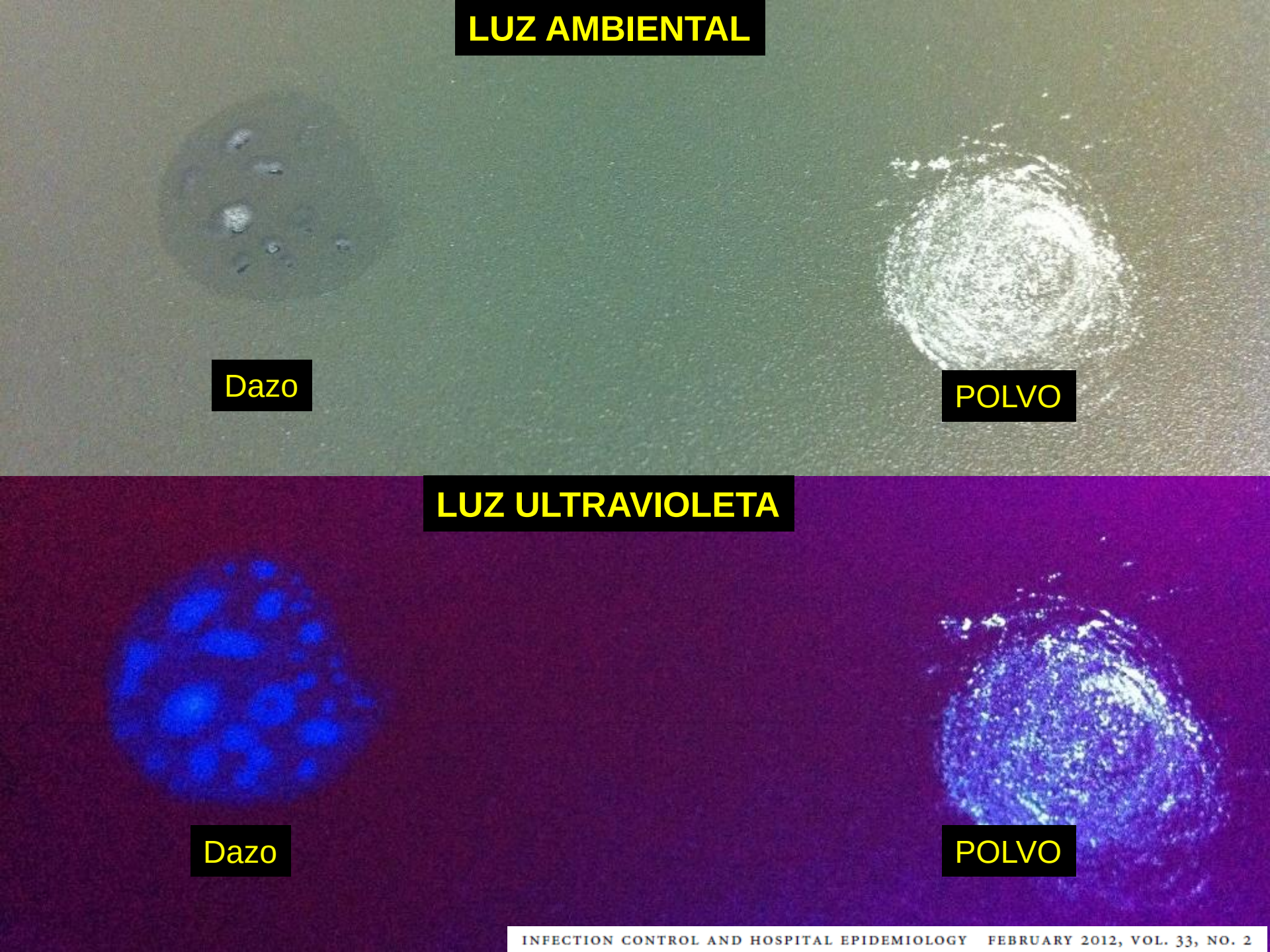


	Occupied room		Terminal cleaning	
	Who?	How often?	Who?	How often?
Bed rails	ES	Daily	ES	Upon discharge
Head/footboard	ES	Daily	ES	Upon discharge
Bedside table	ES	Daily	ES	Upon discharge
IV poles	Nursing	aily	ES	Upon discharge
IV pumps	Nursing	aily	Centralized area	Upon discharge
Ventilators	Respiratory therapist	very shift	Respiratory therapist	Upon discharge
Air flow meters	Respiratory therapist	aily	ES	Upon discharge
Vitals monitor	PCT/Nursing	aily	ES	Upon discharge
Portable computers on wheels	User	Every shift	N/A	N/A
Computer inside room	ES	Daily	ES	Upon discharge

ES: environmental services


Compramos
lámparas
ultravioletas

Está ocurriendo limpieza solo de polvo fluorescente?


LUZ AMBIENTAL
Dazo
POLVO
LUZ ULTRAVIOLETA
Dazo
POLVO

Porqué el ambiente es importante?

Acinetobacter baumannii: Asociación entre contaminación ambiental de cuartos y los ocupantes

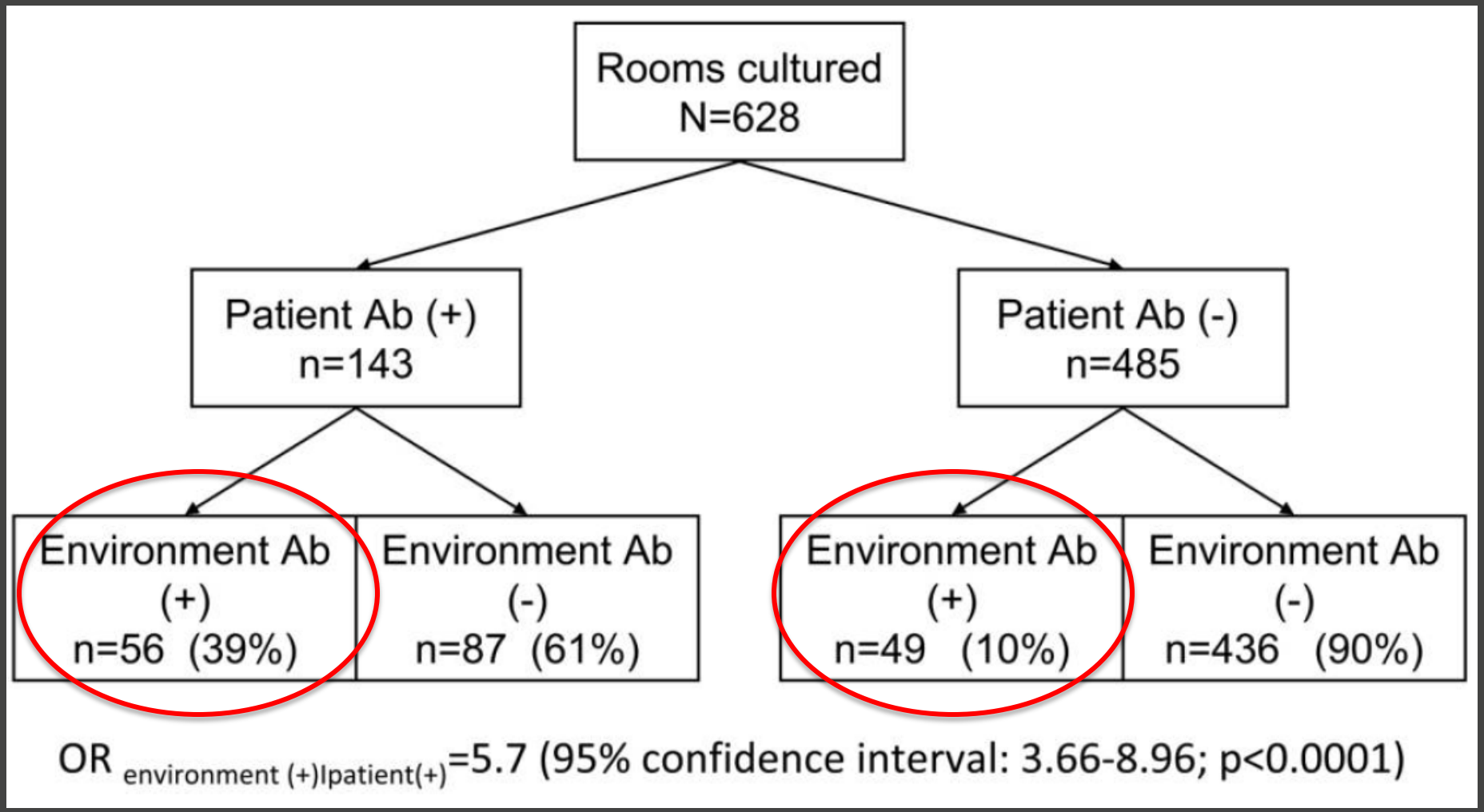
L. Silvia Munoz-Price, MD;[1,2,3] Nicholas Namias, MD;[4] Timothy Cleary, PhD;[5] Yovanit Fajardo-Aquino, MD;[3] Dennise DePascale, MT;[3] Kristopher L. Arheart, EdD;[2,6] Jesabel I. Rivera, BS;[7] Yohei Doi, MD, PhD[7]

We aimed to determine the association between the presence of *Acinetobacter baumannii* in patient rooms and the carrier status of the occupants. Fifty-six (39%) of 143 rooms with *A. baumannii*–positive patients had results positive for *A. baumannii*. Only 49 (10%) of 485 rooms with *A. baumannii*–negative patients were positive (odds ratio, 5.72 [95% confidence interval, 3.66–8.96]; $P <$ .0001). Clinical and environmental isolates shared pulsed-field gel electrophoresis patterns.

Infect Control Hosp Epidemiol 2013;34(5):517-520

Weekly active surveillance cultures (rectal and respiratory samples) were standard among all of our adult ICU patients. The *A. baumannii* status of patients present in each of the ICUs was available in the patient census and maintained by the Infection Control Department on the basis of microbiology data. A patient with at least 1 culture positive for *A. baumannii*, including surveillance and clinical cultures, was considered to be positive for *A. baumannii*.

Environmental cultures were performed weekly on a rotating basis (1–2 units/week) across the selected ICUs. The following 4 standard objects were cultured from inpatient rooms: bed rails, bedside tables, intravenous pumps, and ventilator control panels (unless the object was not present). No other objects were analyzed in this project. Approximately 10 × 10 cm of each surface was sampled using premoistened 6-inch cotton swabs (Sterile Cotton-Tipped Applicators; MediChoice). A single swab was used for each individual surface. Swabs were promptly placed in trypticase soy broth (BD Diagnostics) and incubated overnight at 37°C. Broths showing turbidity were subcultured onto both blood and MacConkey agar plates. To aid in the detection of resistant



Munoz-Price, et al. Infect Control Hosp Epidemiol 2013; 34(5):517-520

Porqué el ambiente es importante?

Multidrug-Resistant Bacteria	Hands Contaminated Before Room Entry[a]	Gowns	Gloves	Hands After Removal	Gowns or Gloves (95% confidence intervals)
Methicillin-resistant *Staphylococcus aureus* (23 patients)	3.2% (5/157)	3.9% (6/152)	11.2% (17/152)	3.3% (5/152)	13.8% (8.3% to 19.2%)
Vancomycin-resistant *Enterococci* (27 patients)	0.6% (1/181)	5.0% (9/180)	10.0% (18/180)	1.7% (3/180)	13.9% (8.9% to 18.9%)
Multidrug-resistant *Pseudomonas aeruginosa* (13 patients)	3.4% (3/89)	2.3% (2/86)	17.4% (15/86)	3.5% (3/86)	17.4% (9.4% to 25.4%)
Multidrug-resistant *Acinetobacter baumannii* (26 patients)	5.1% (9/176)	12.6% (21/167)	29.3% (49/167)	4.2% (7/167)	32.9% (25.8% to 40.0%)

[a]Interactions in which healthcare workers' hands were contaminated before room entry were excluded from further analysis.

Morgan et al. Crit Care Med 2012 Apr

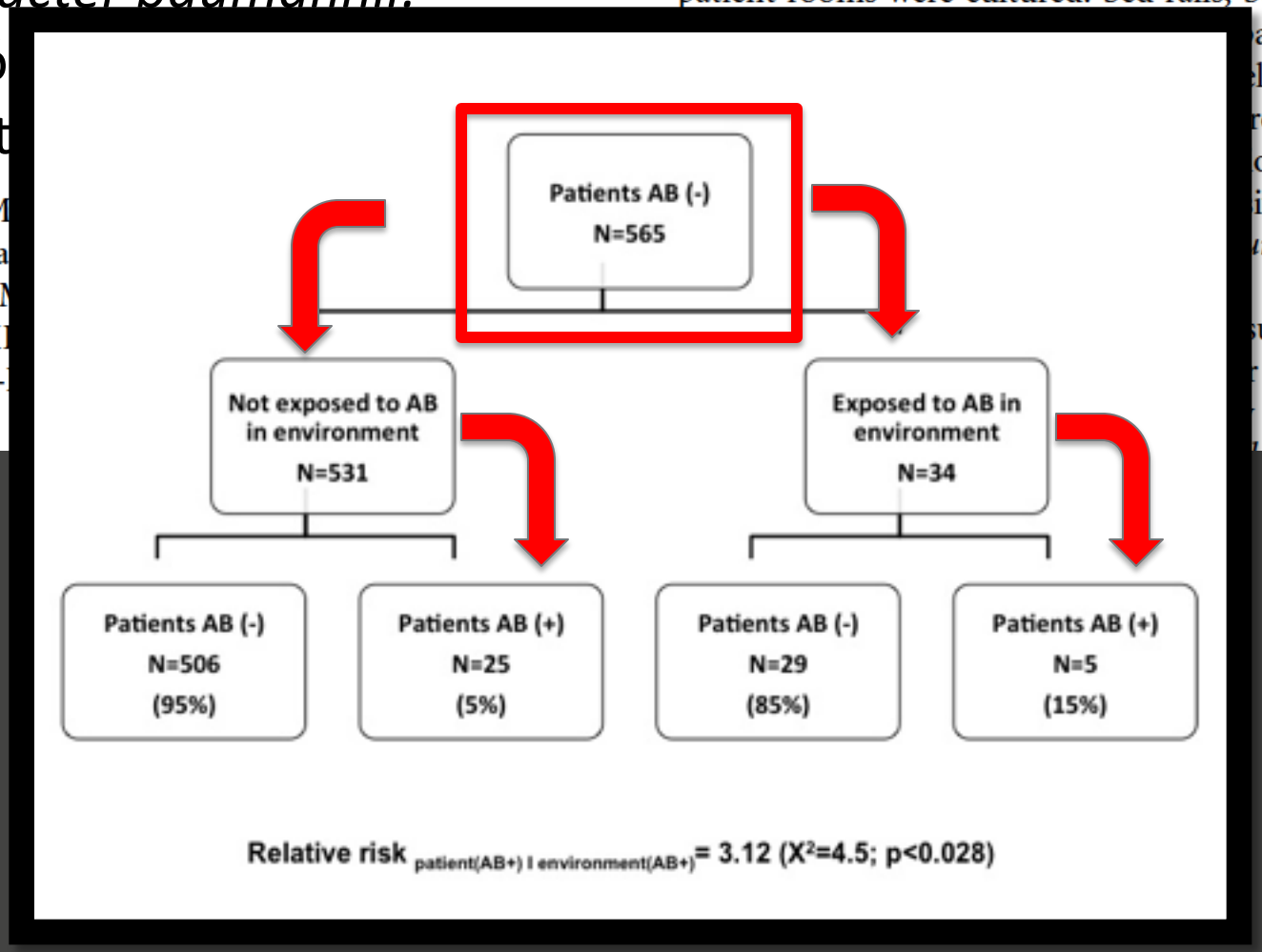
CONCISE COMMUNICATION

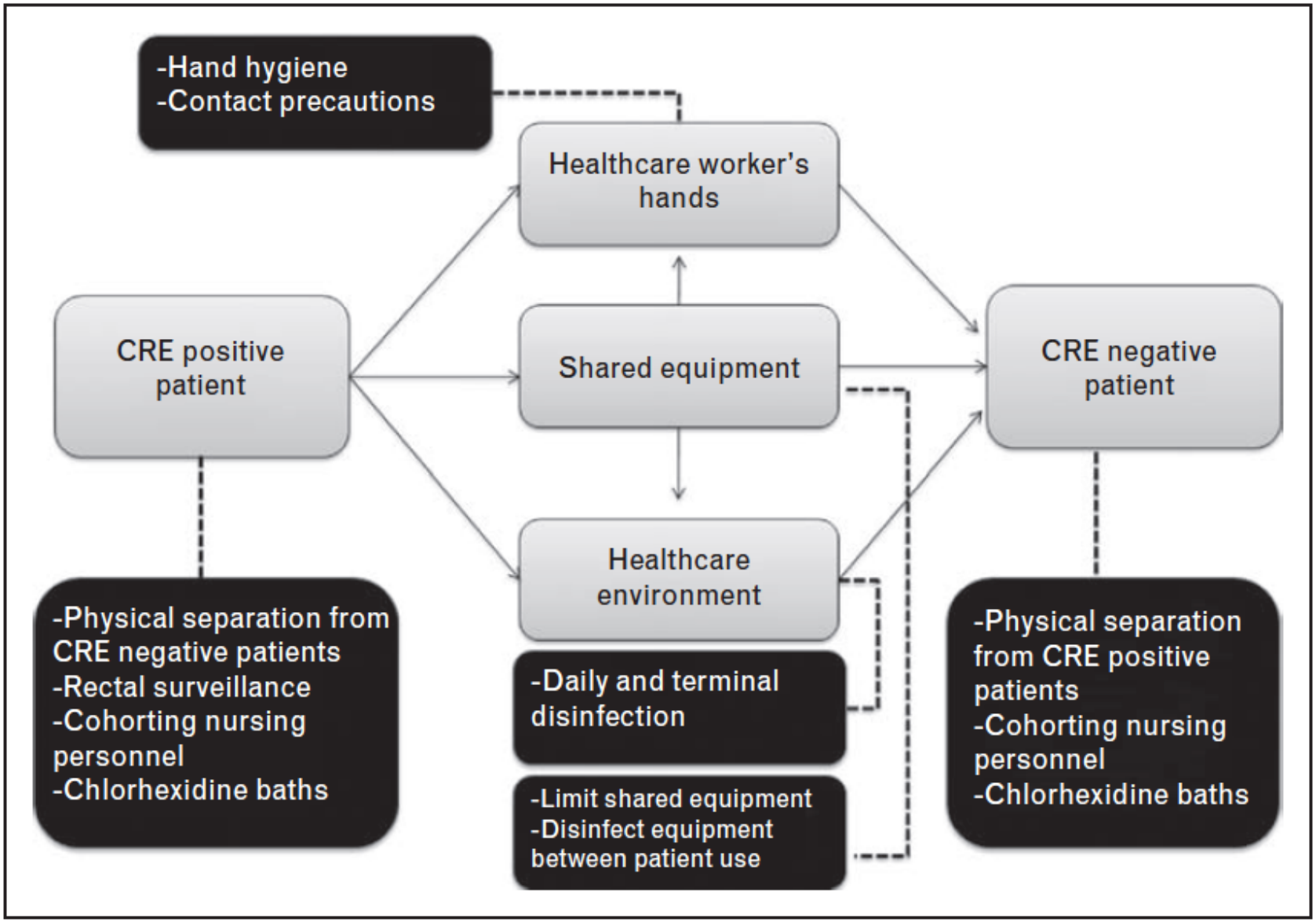
Acinetobacter baumannii:
Exposició
de Acinet

Rossana Rosa, M
Dennise Depasca
Daniel H. Kett, M
Louis Pizano, MI
L. Silvia Munoz-

Environmental cultures. Four standard objects from in-
patient rooms were cultured: bed rails, bedside tables, intra-
anels. Samples were
lsewhere.[9] Environ-
ross 5 adult ICUs on
od. A patient room
itive if any of the 4
umannii on environ-

urveillance cultures
all patients on ad-
thereafter. Sources





Munoz-Price & Quinn. Curr Opin Infect Dis 2013, 26:378–387

ESCMID PUBLICATIONS 10.1111/1469-0691.12427

ESCMID guidelines for the management of the infection control measures to reduce transmission of multidrug-resistant Gram-negative bacteria in hospitalized patients

E. Tacconelli[1], M. A. Cataldo[2], S. J. Dancer[3], G. De Angelis[4], M. Falcone[5], U. Frank[6], G. Kahlmeter[7], A. Pan[8,9], N. Petrosillo[2], J. Rodríguez-Baño[10,11,12], N. Singh[13], M. Venditti[5], D. S. Yokoe[14] and B. Cookson[15]

National Center for Emerging and Zoonotic Infectious Diseases
Division of Healthcare Quality Promotion

ESTADÍOS DE CAMBIO

- Sentido de urgencia
- Crear una coalición
- Desarrollar una visión y estrategia
- Comunicar la visión a otros miembros
- Generando victorias pequeñas y tempranas
- Cambiando la cultura de la institución

Kotter JP. Leading Change. Harvard Business Review

Contents lists available at ScienceDirect

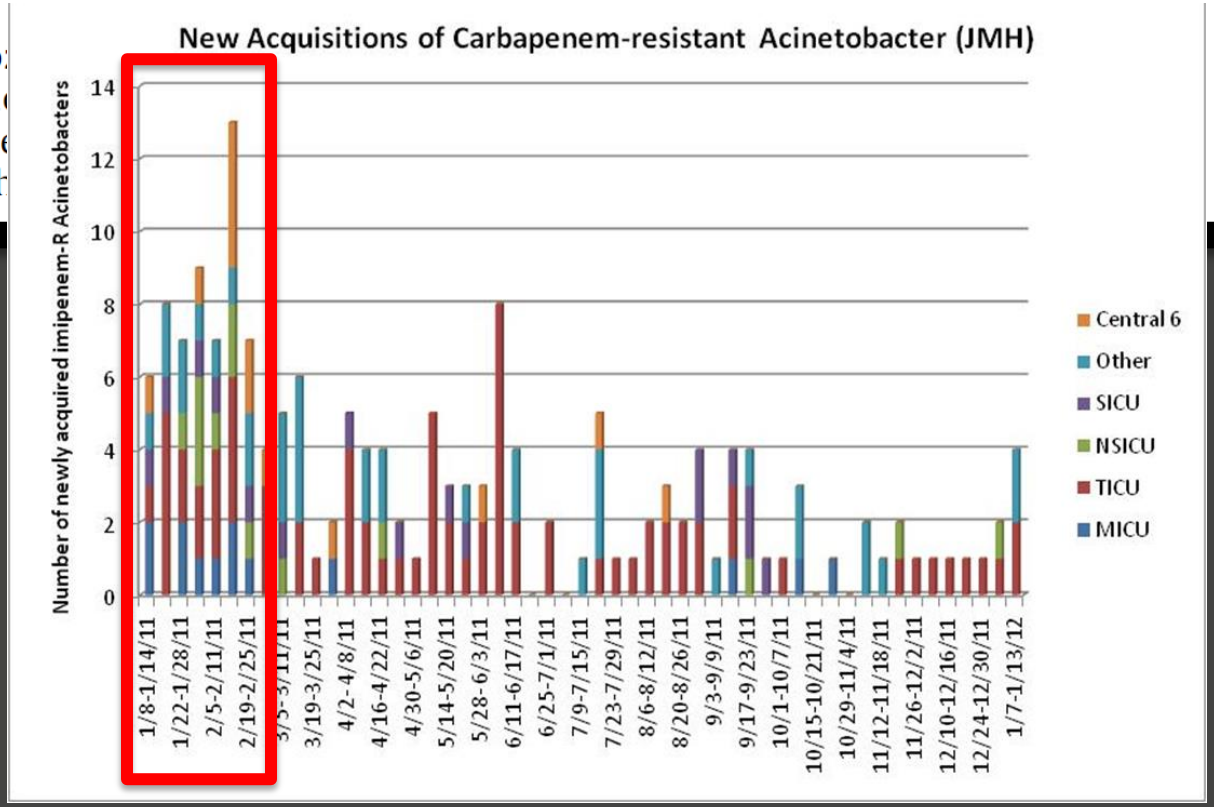
American Journal of Infection Control

journal homepage: www.ajicjournal.org

Major article

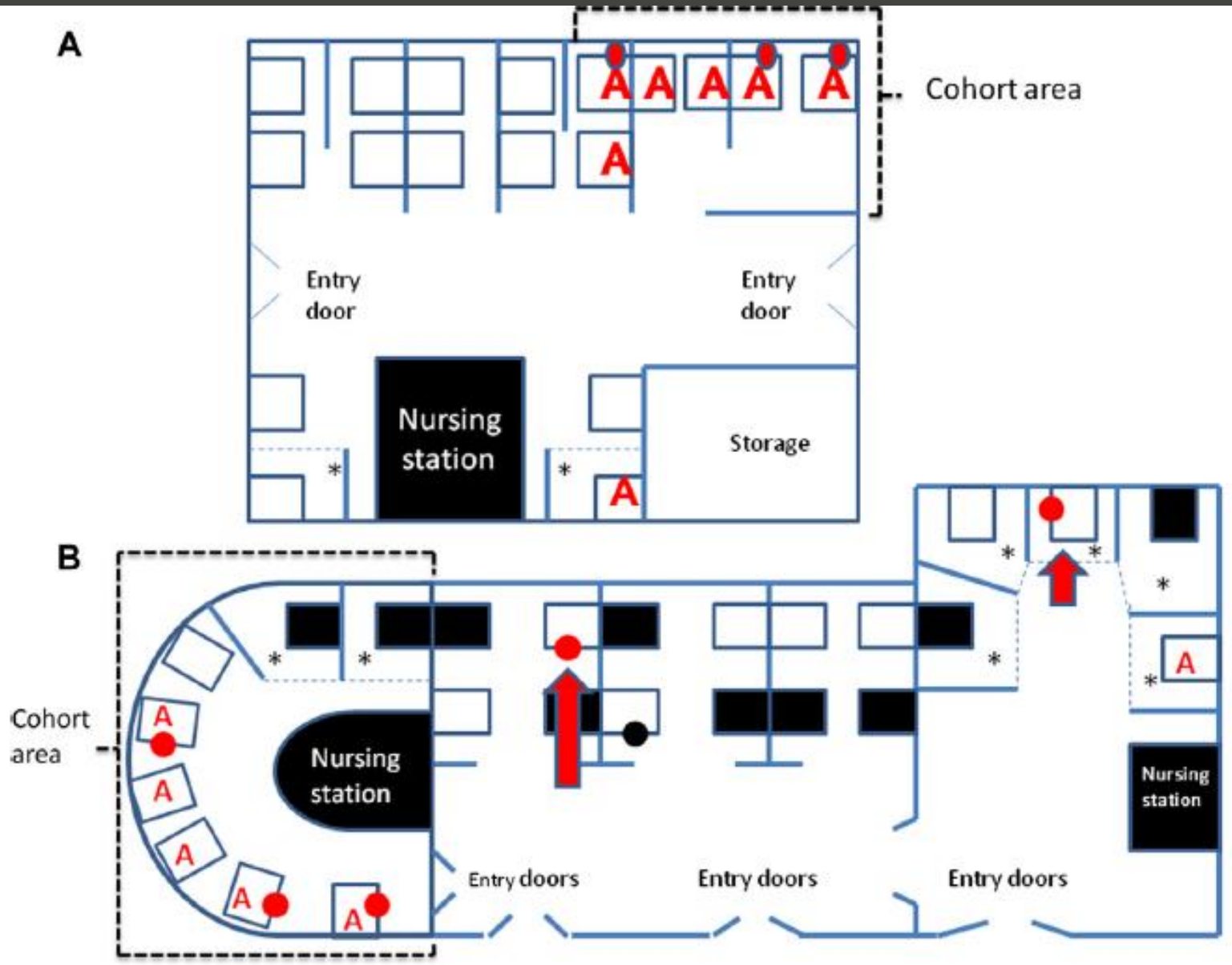
Control de una situación endémica con *Acinetobacter baumannii*: Diseminación electrónica de un grupo de intervenciones

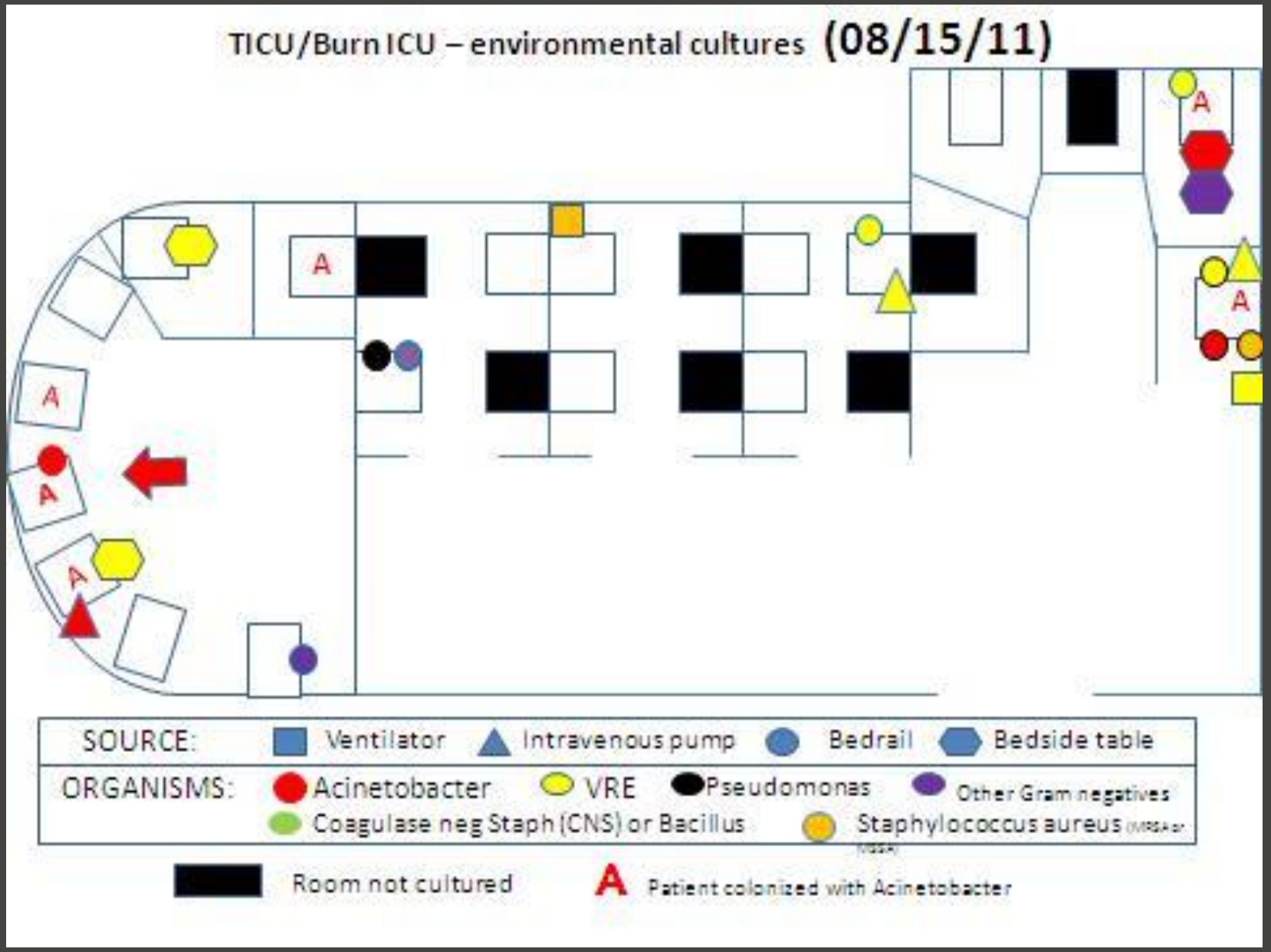
L. Silvia Muno
Yovanit Fajard
Michael Hughe
Kristopher Arh



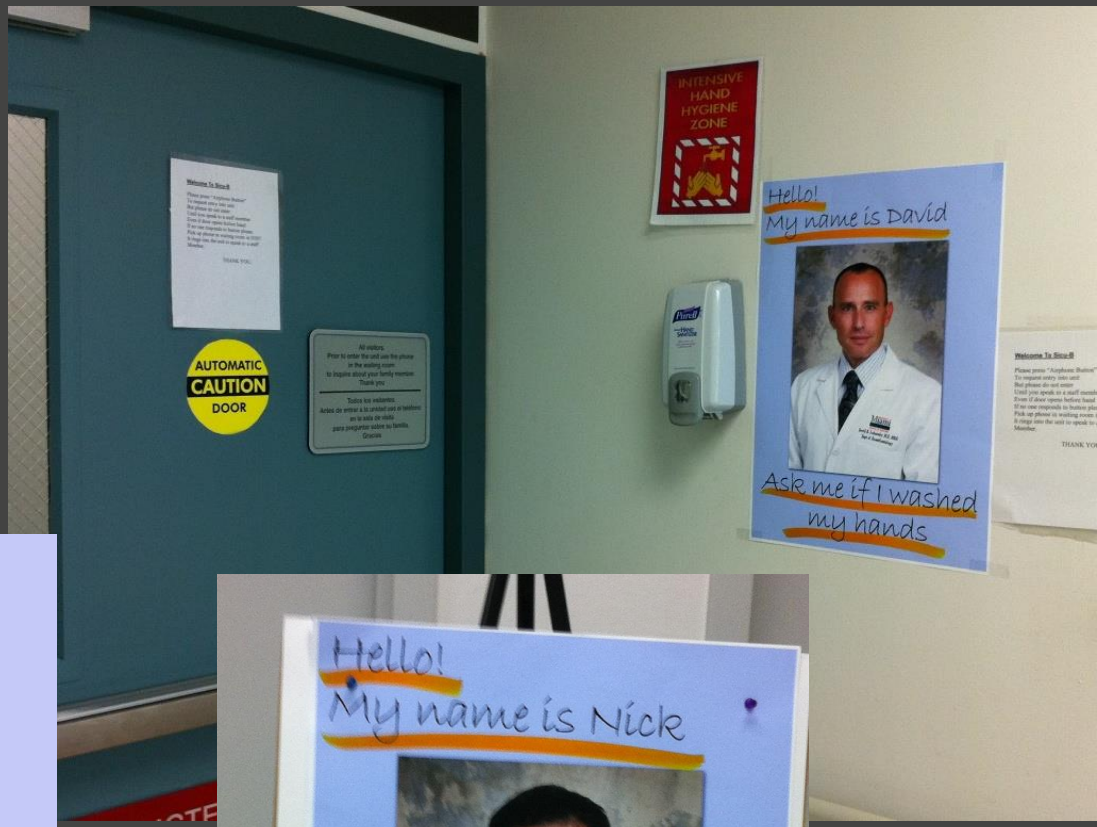
Emails semanales

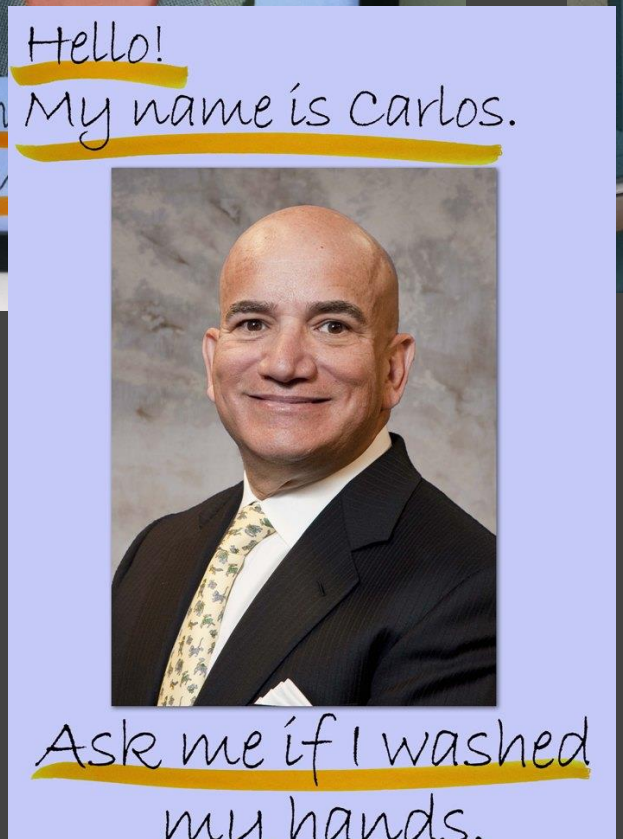
Unidades fueron ranqueadas

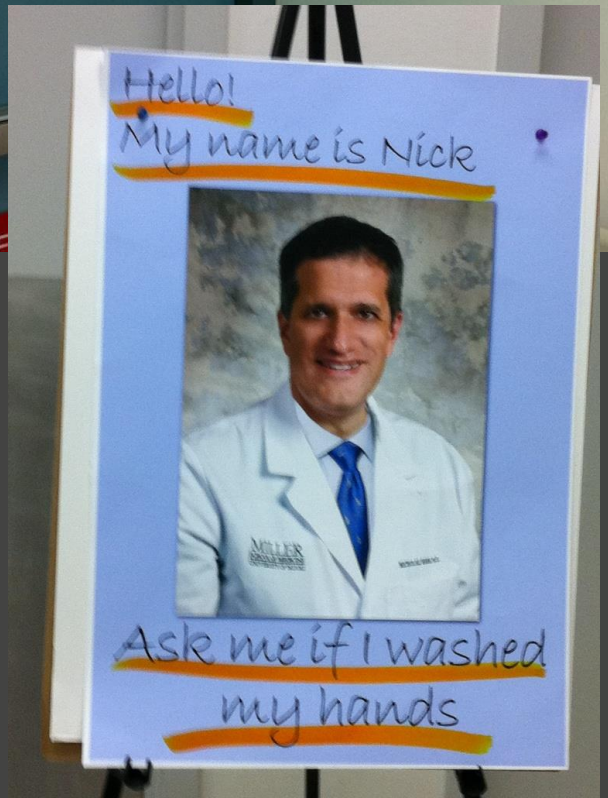

A
A A A A A
A
Cohort area
Entry door
Entry door
Nursing station
Storage
*
*
A
B
Cohort area
A
A
A
A
A
Nursing station
Entry doors
Entry doors
Entry doors
Nursing station
*
*
*
*
*
*
A


TICU/Burn ICU – environmental cultures (08/15/11)
A
A
A
A
A
A
SOURCE:
Ventilator
Intravenous pump
Bedrail
Bedside table
ORGANISMS:
Acinetobacter
VRE
Pseudomonas
Other Gram negatives
Coagulase neg Staph (CNS) or Bacillus
Staphylococcus aureus
Room not cultured
A
Patient colonized with Acinetobacter


Hello!
My name is Mara


INTENSIVE HAND HYGIENE ZONE
AUTOMATIC
CAUTION
DOOR
Hello!
My name is David
Ask me if I washed my hands


Hello!
My name is Carlos.
Ask me if I washed my hands.

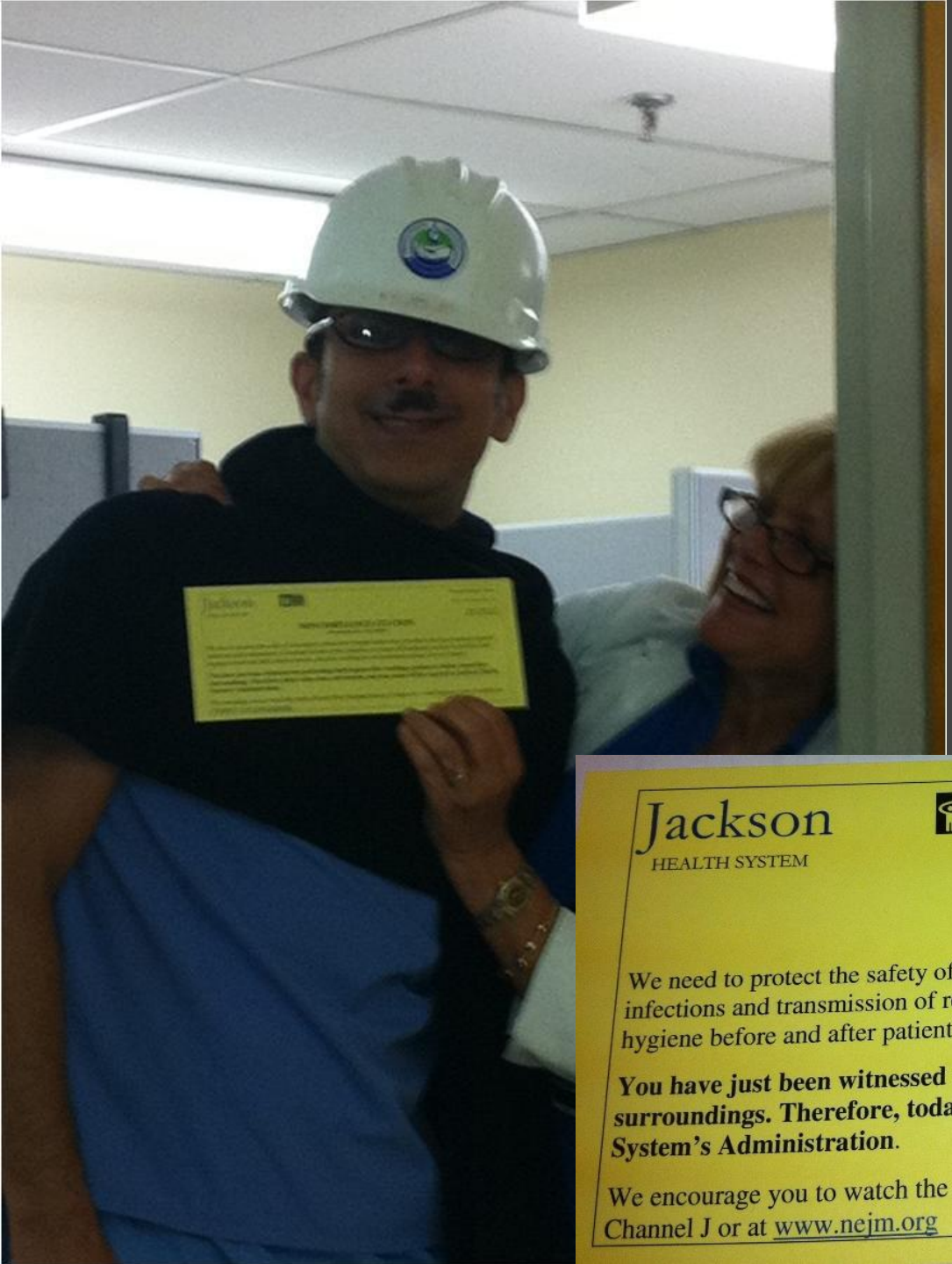

Hello!
My name is Nick
Ask me if I washed my hands


EBP WORKSHOP
Wash
Urgently!


FIRE
Hello! Do you
know who's
on the phone?


INTENSIVE
HAND
"Heavy
Load"


AUTOMATIC
DOOR



Jackson
HEALTH SYSTEM

PUBLIC HEALTH TRUST

Infection Prevent

1611 NW 12th A

Mia
Phon

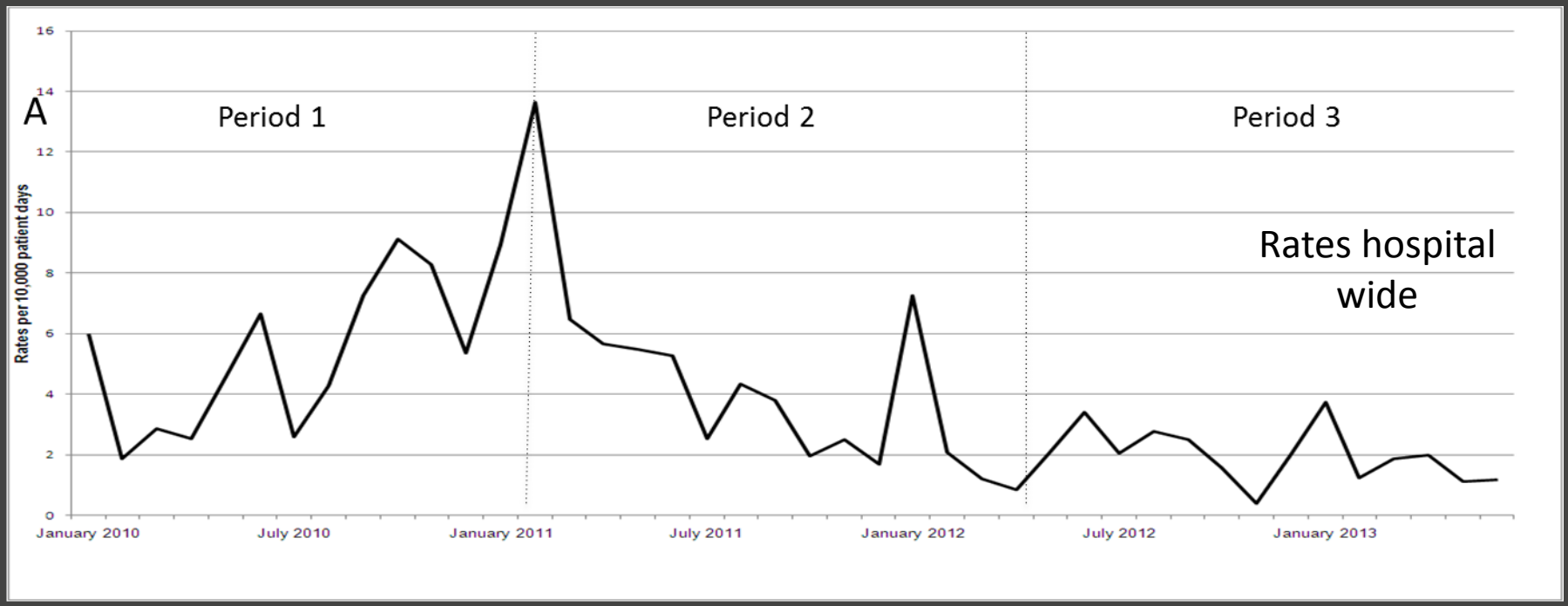
NONCOMPLIANCE CITATION

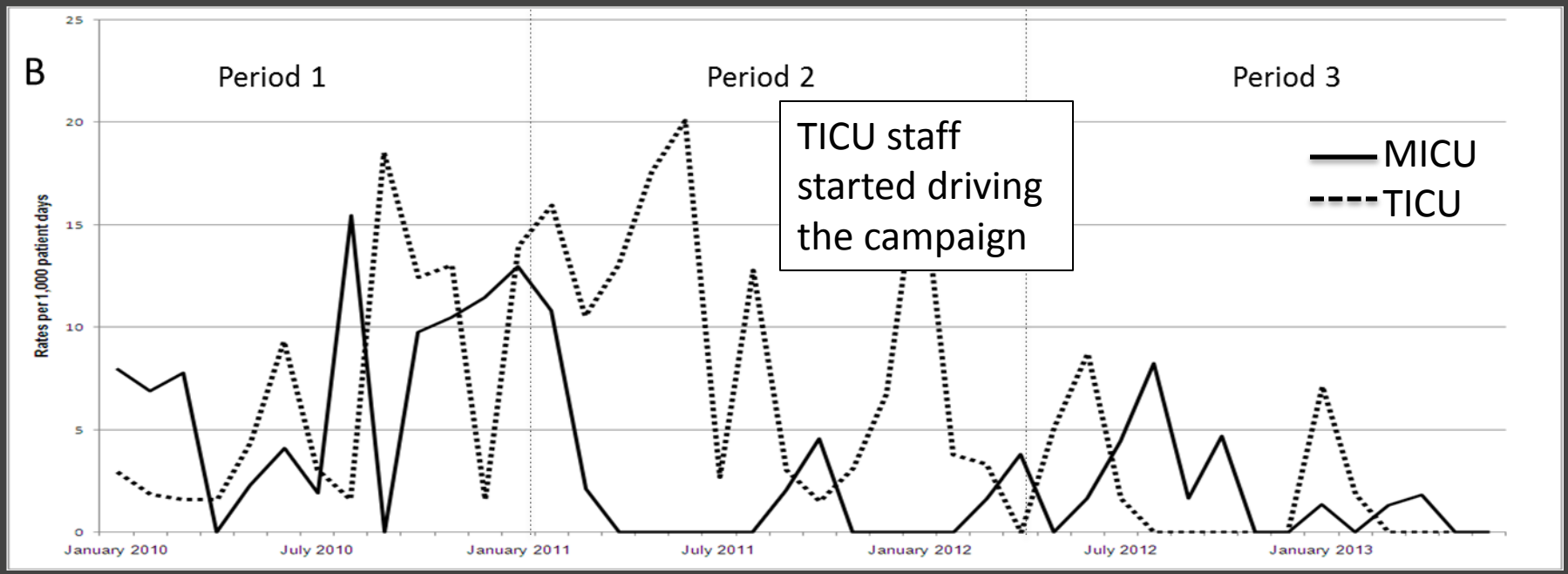
JHS Administrative Policy 400.085

We need to protect the safety of our patients during their hospital admissions. In order to decrease hospita
infections and transmission of resistant bacteria across patients, we require all healthcare workers to perf
hygiene before and after patient contacts, and after touching the environmental surfaces next to patients.

**You have just been witnessed not performing hand hygiene after touching a patient or his/her im
surroundings. Therefore, today's date, time, unit location, and your name will be reported to Jac
System's Administration.**

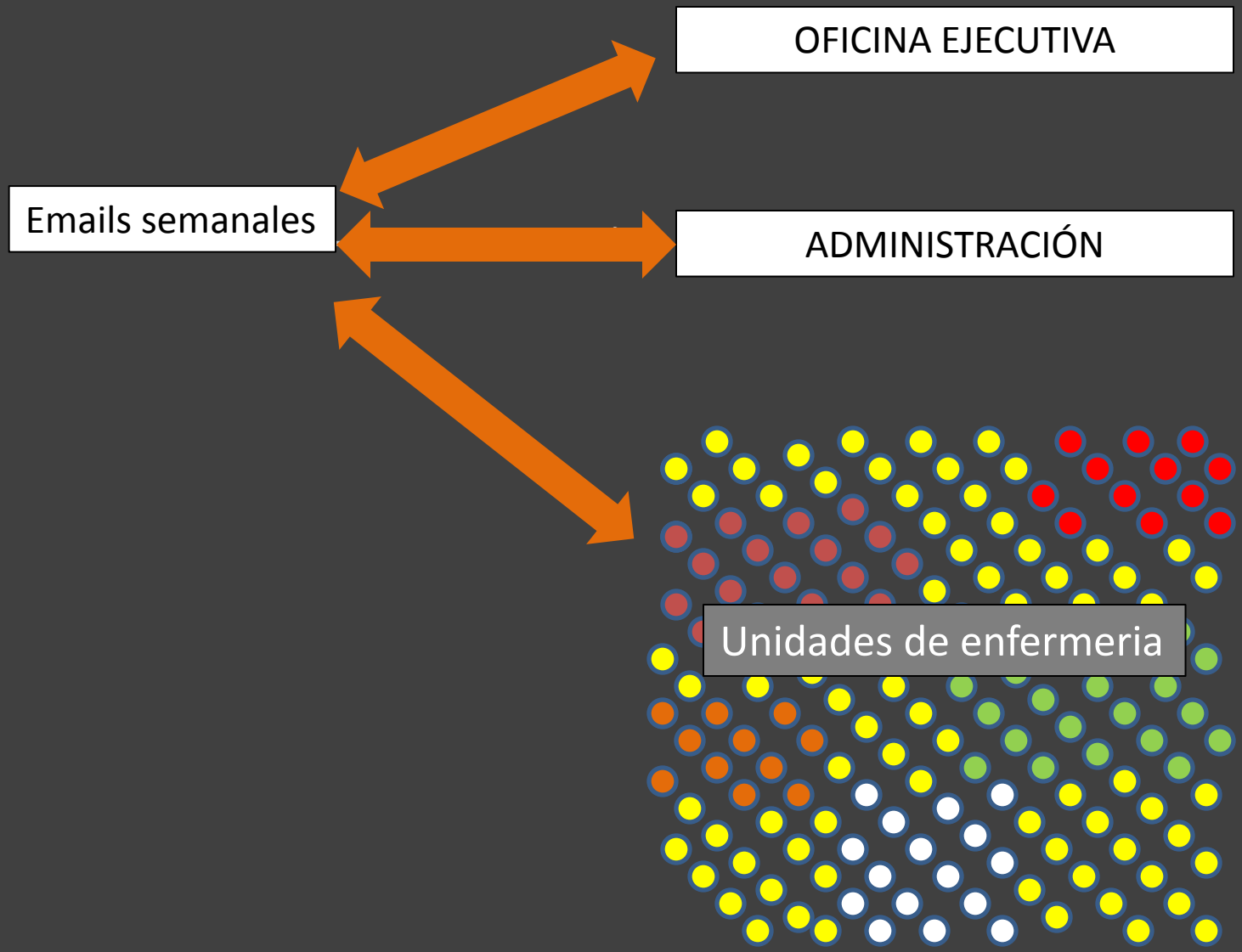
We encourage you to watch the newly released New England Journal of Medicine's hand hygiene vid
Channel J or at www.nejm.org

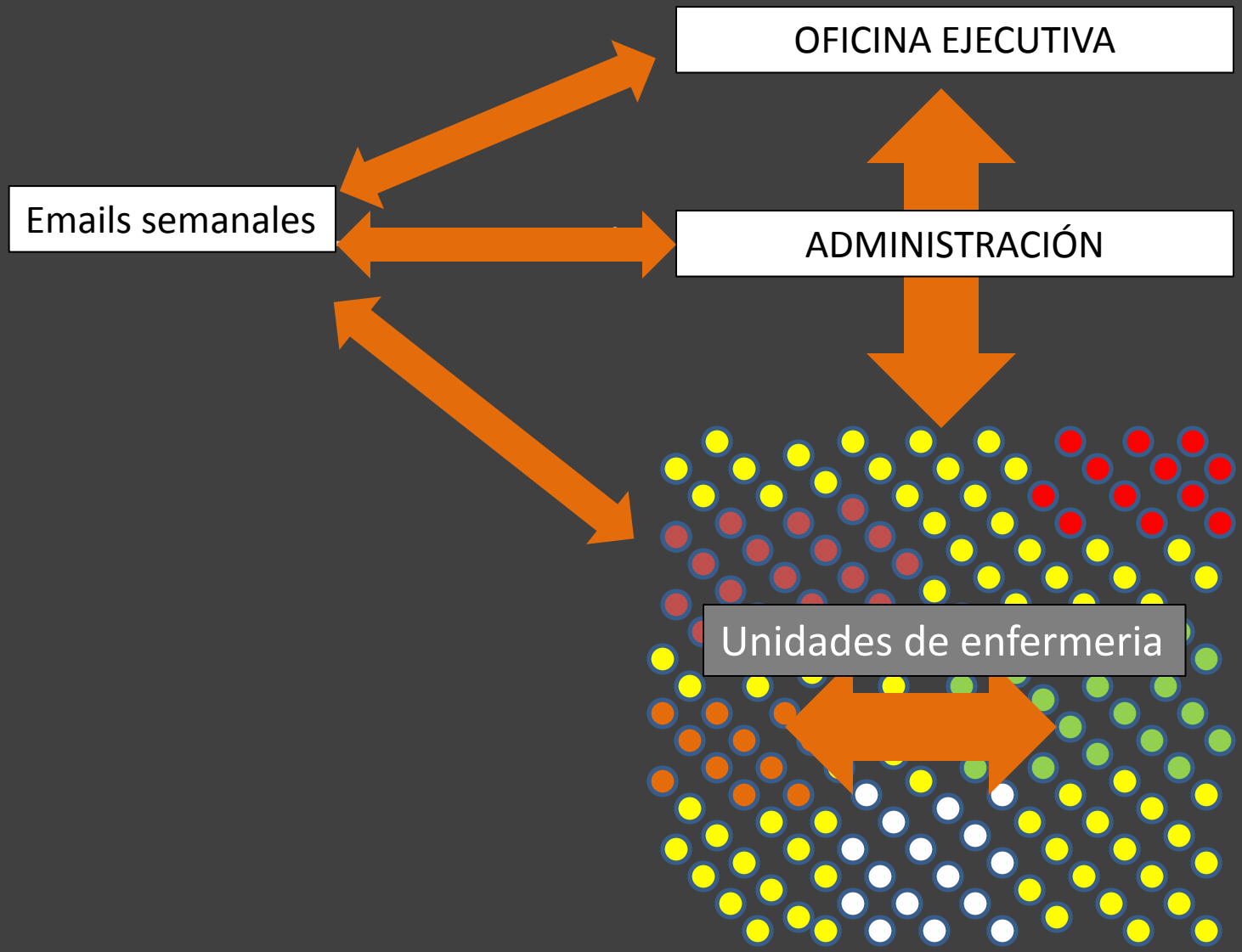

A
Period 1
Period 2
Period 3
Rates hospital wide
Rates per 10,000 patient days
0
2
4
6
8
10
12
14
16
January 2010
July 2010
January 2011
July 2011
January 2012
July 2012
January 2013

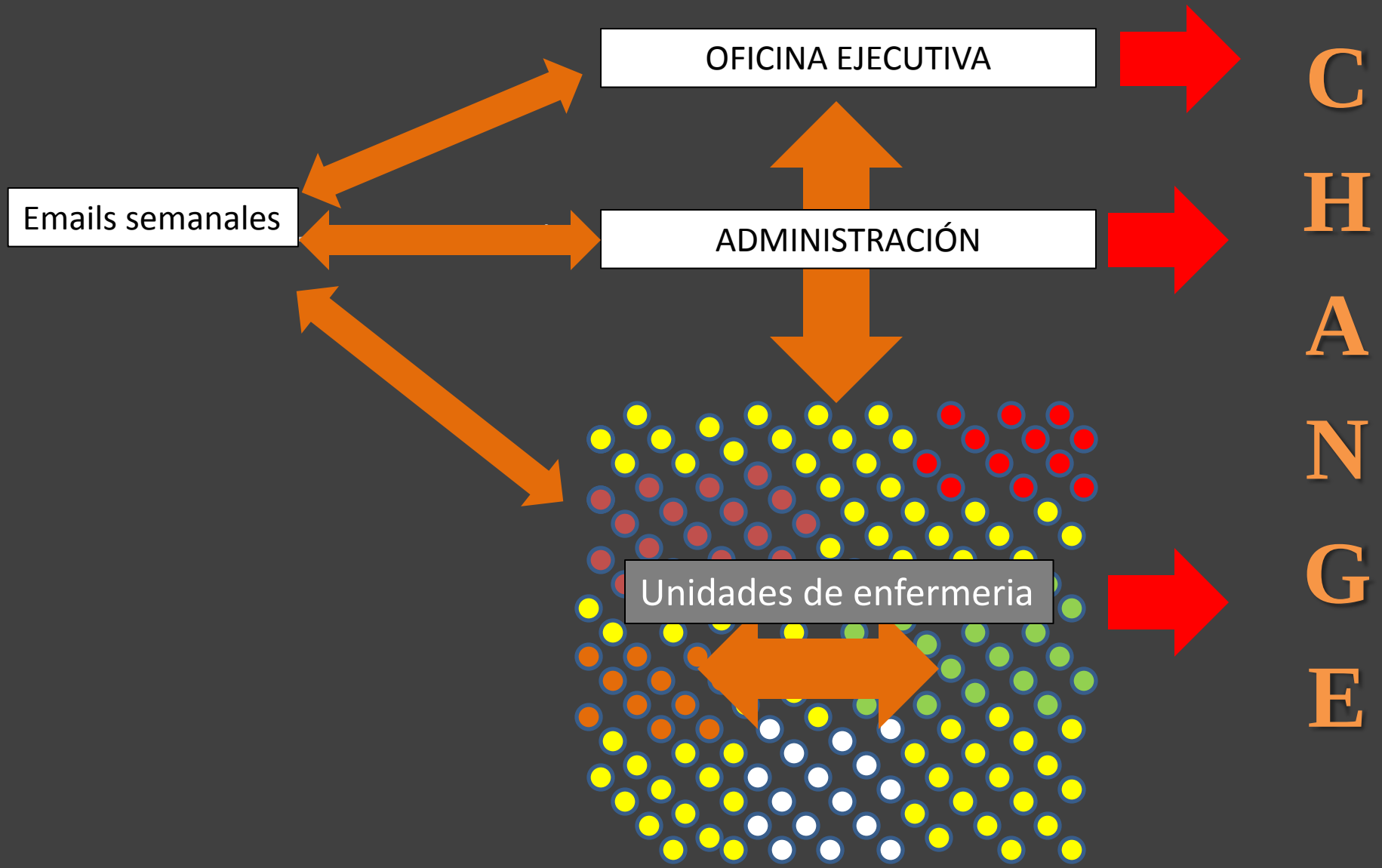

B
Period 1
Period 2
Period 3
TICU staff started driving the campaign
MICU
TICU
Rates per 1,000 patient days
0
5
10
15
20
25
January 2010
July 2010
January 2011
July 2011
January 2012
July 2012
January 2013

OFICINA EJECUTIVA

ADMINISTRACIÓN

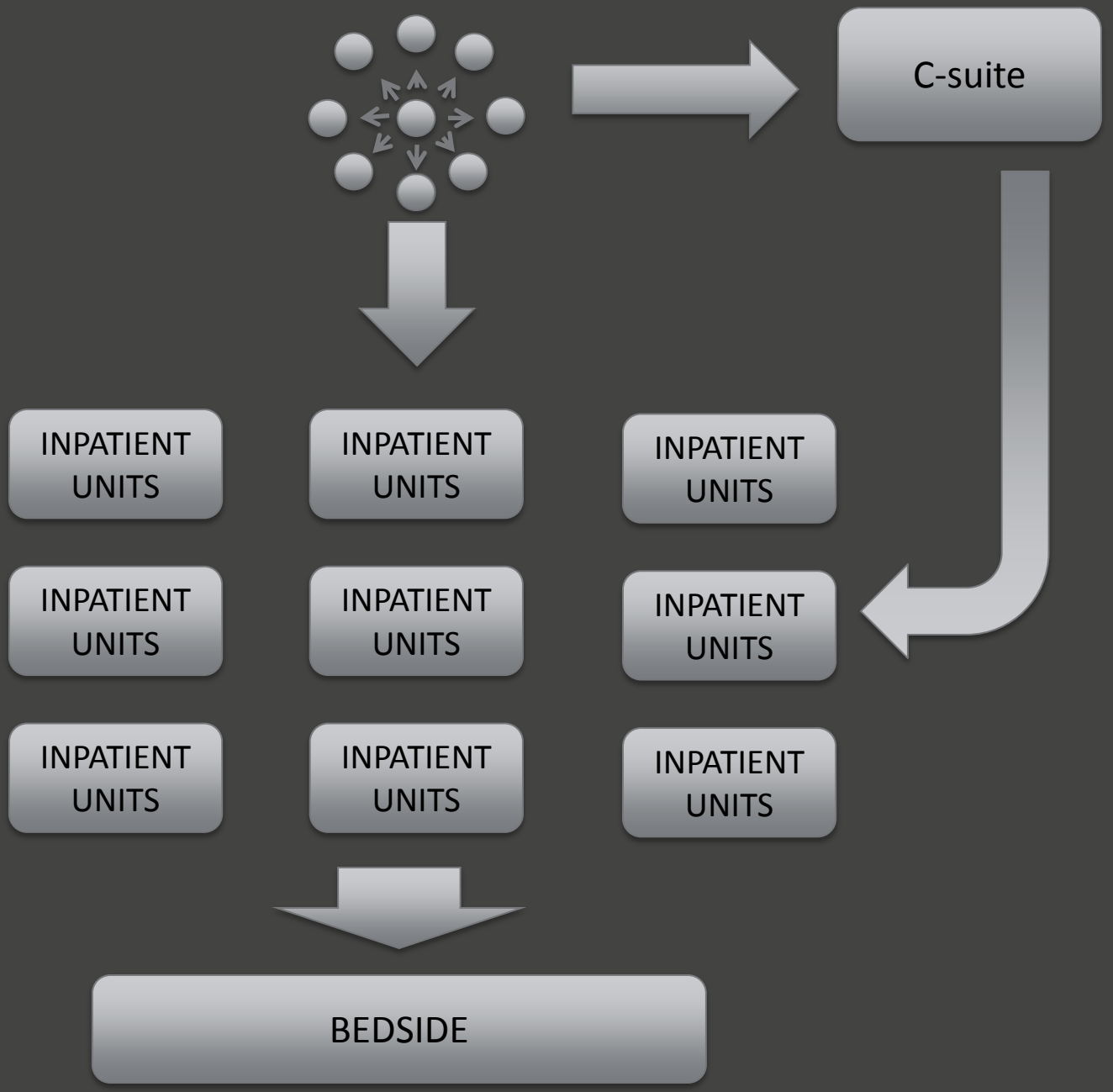

OFICINA EJECUTIVA
Emails semanales
ADMINISTRACIÓN
Unidades de enfermeria


OFICINA EJECUTIVA
Emails semanales
ADMINISTRACIÓN
Unidades de enfermeria


OFICINA EJECUTIVA
Emails semanales
ADMINISTRACIÓN
Unidades de enfermeria
CHANGE

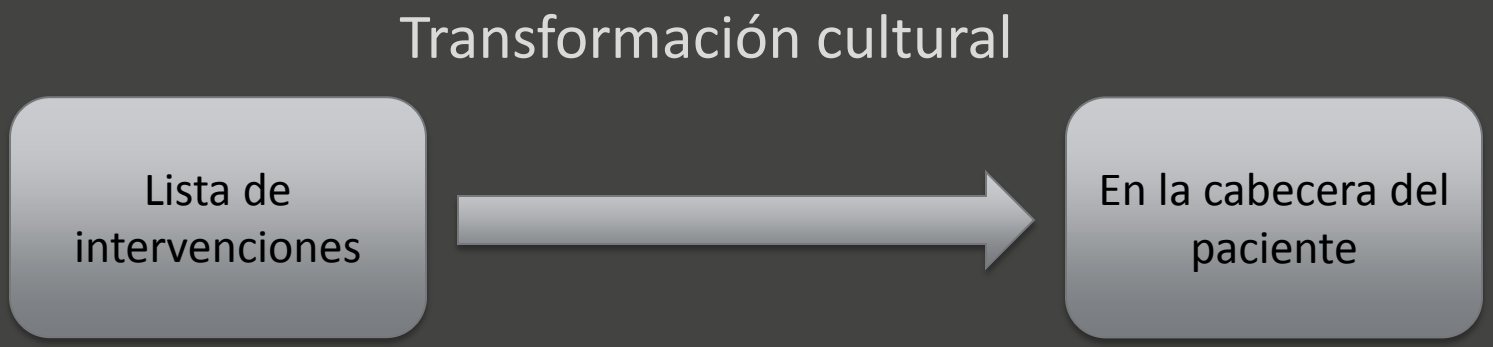
CAMBIAR NO ES FÁCIL

TOMA TIEMPO Y ES TRAUMÁTICO


C-suite
INPATIENT UNITS
INPATIENT UNITS
INPATIENT UNITS
INPATIENT UNITS
INPATIENT UNITS
INPATIENT UNITS
INPATIENT UNITS
INPATIENT UNITS
INPATIENT UNITS
BEDSIDE

EN CONCLUSIÓN…

- Hay muchas intervenciones
- Implemente varias al mismo tiempo
- Identificación y cohorte es fundamental



THANK YOU!