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花蓮慈濟醫院

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住院環境終期清消對 MDRO感染管制成效探討

鍾惠君

花蓮慈濟醫院護理部 副主任

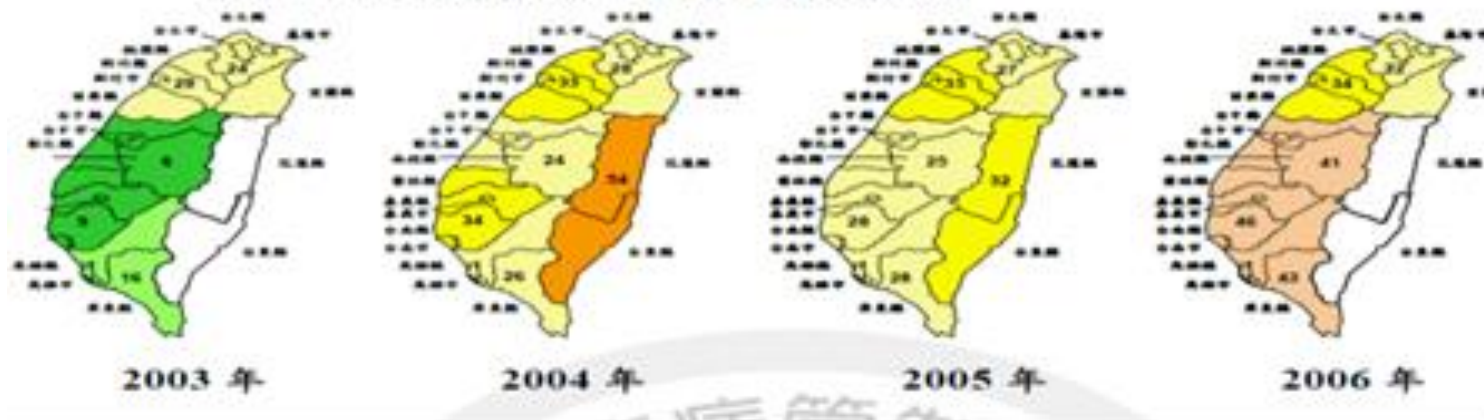
台灣感染管制學會 東區 分會長

106.03.19



從色變談起

圖十四。2003 至 2009 年第 4 季區域級以上醫院加護病房區域別(台北區、北區、中區、高屏區、東區)院內感染 CRAB 百分比分佈圖



2007 至 2016 年第 2 季，區域級以上醫院加護病房醫療照護相關感染 CRAB 比率在 6 個區域的分布如圖 6。於 2007 年以東區(78.3%)最為嚴重；2016 年第 2 季 CRAB 比率以台北區(75.7%)為最，高屏區(74.4%)次之。





HAPPY



鄭順賢主任

何愉懷主任

秀惠感管師

楨惠組長(前)

惠莉組長

鍾惠君副主任

王立信副院長

BIRTHDAY
YouCam Perfect

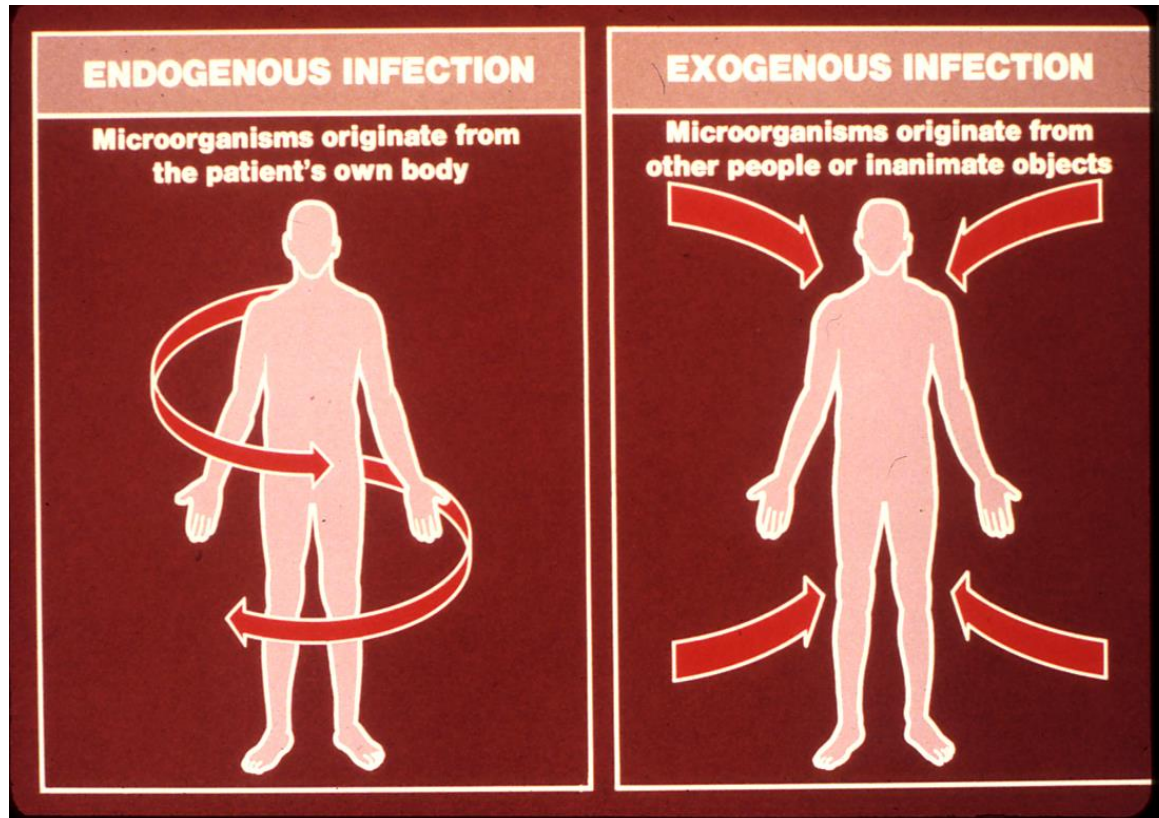


大綱

- 醫療機構環境與MDRO 的存在
- 醫療機構環境清潔指引與實務操作的距離
- 東區的終期環境清潔與院感成效經驗分享
- 限制與討論
- 結論



醫療機構環境與MDRO 的存在



- Patients' endogenous flora, 40%–60%; cross infection via the hands of personnel, 20%–40%; antibiotic-driven changes in flora, 20%–25%; and other (including contamination of the environment), 20%. (Weinstein RA. Epidemiology and control of nosocomial infections in adult intensive care units. *Am J Med* 1991;91(suppl 3B):179S–184S.)

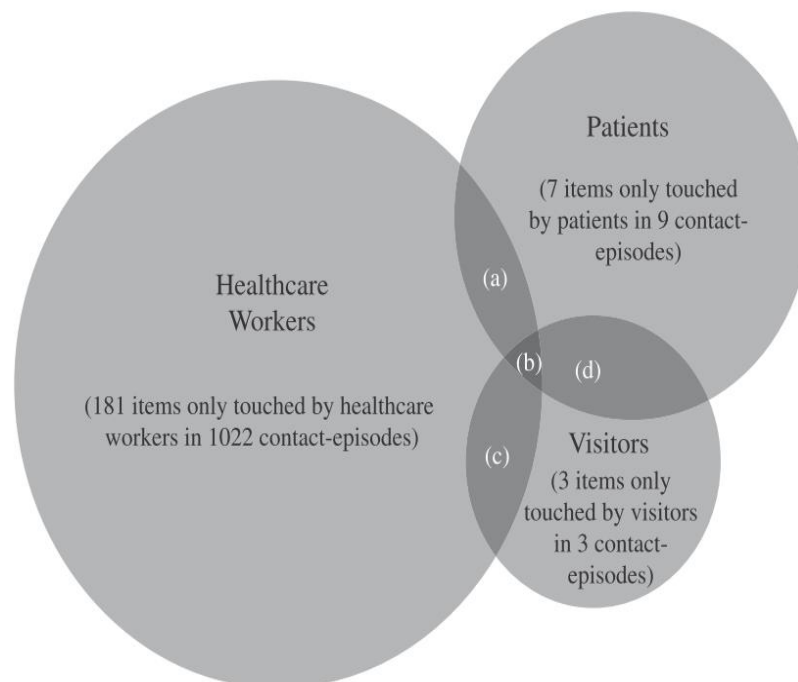
Hand-touch contact assessment of high-touch and mutual-touch surfaces among healthcare workers, patients, and visitors

V.C.C. Cheng^{a,b}, P.H. Chau^c, W.M. Lee^b, S.K.Y. Ho^b, D.W.Y. Lee^b,
S.Y.C. So^a, S.C.Y. Wong^a, J.W.M. Tai^b, K.Y. Yuen^{a,*}

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賴在醫院 小心院內感染
鮑氏不動桿菌 院內感染新殺手



醫院內感染中的鮑氏不動桿菌，令醫護人員聞之色變。（本報檔案照）

RESEARCH ARTICLE

Open Access

A prospective study to examine the epidemiology of methicillin-resistant *Staphylococcus aureus* and *Clostridium difficile* contamination in the general environment of three community hospitals in southern Ontario, Canada

Meredith C Faires^{1*}, David L Pearl¹, William A Ciccotelli^{2,3}, Karen Straus², Giovanna Zinken⁴, Olaf Berke^{1,5}, Richard J Reid-Smith^{1,6} and J Scott Weese⁶

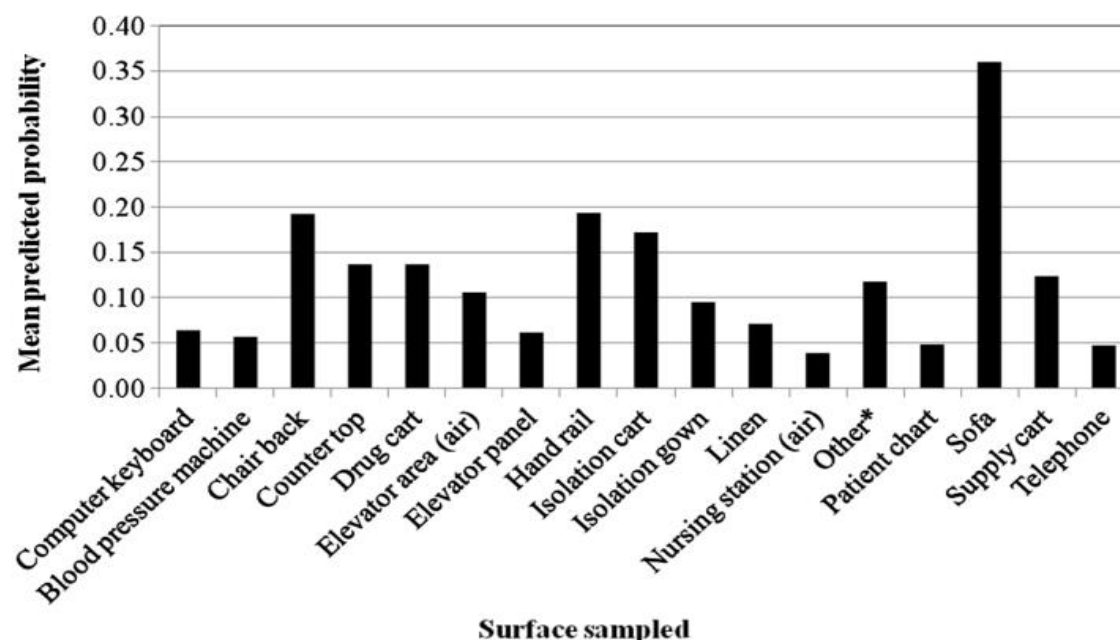


Figure 1 Mean predicted probability for MRSA to be cultured from surfaces in the general environment. * Surfaces include: antibacterial wipes container, brochure holder, bulletin board, chart holder, clip board, door knob, glove box holder, heating oven handle, lamp shade, lifter handle, sofa pillow, urine collection container, visiting room – air.



ESBL-producing Gram-negative organisms in the healthcare environment as a source of genetic material for resistance in human infections

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^c Infection and Immunity, University College London, London, UK

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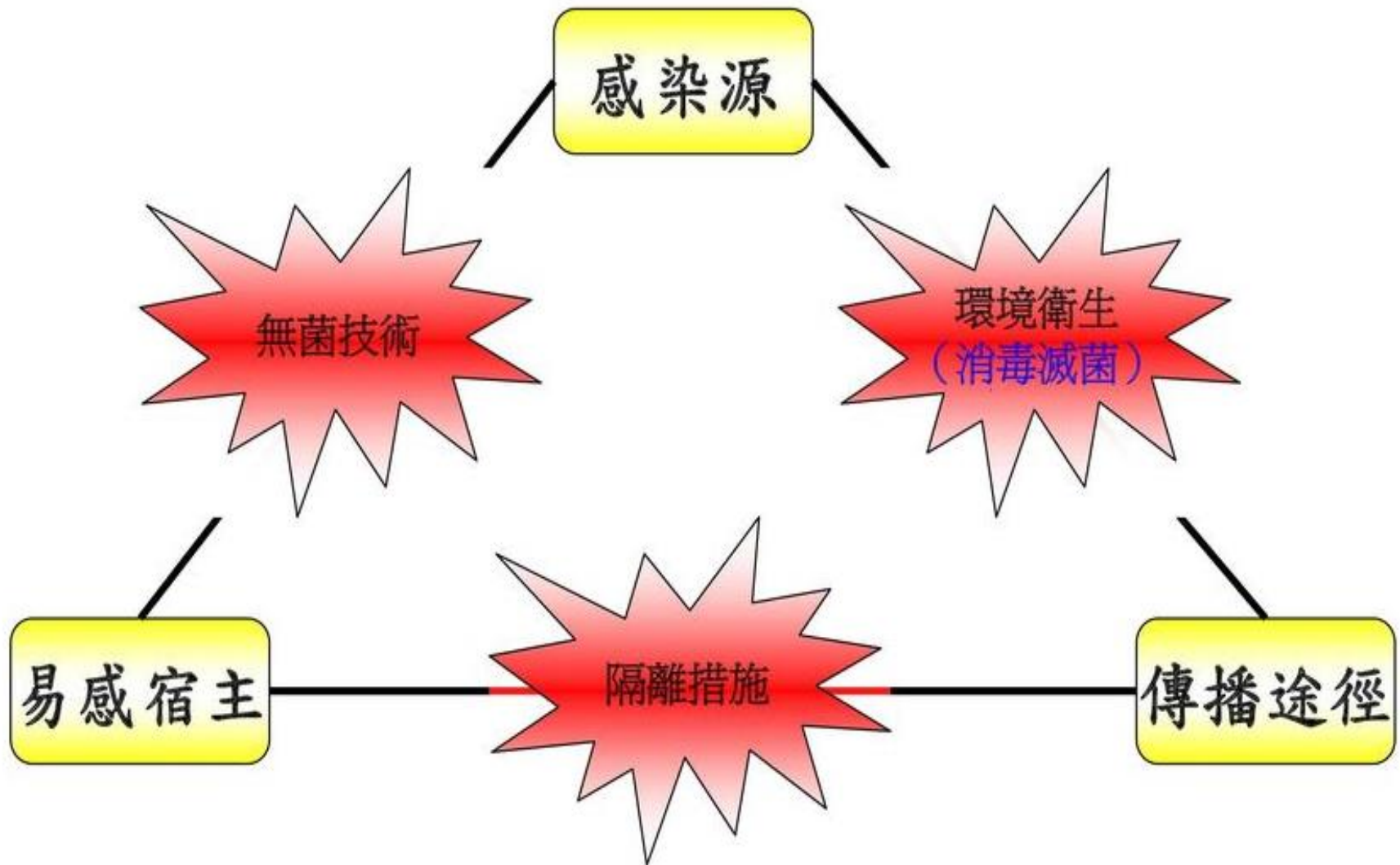
Table I
Surfaces contaminated with extended-spectrum β -lactamase (ESBL)-producing Gram-negative bacteria (GNB) within the hospital environment

Area	Sample point	Site	Percentage (no. of sites from which ESBL GNB recovered/total sampled)	
			In patient room	Within non-clinical area
Handwash sink	1	Towel dispenser	0 (0/79)	0 (0/44)
	2	Tap handle	0 (0/52)	0 (0/40)
	3	Sink rim	1.3 (1/79)	0 (0/45)
	4	Floor beneath the sink	2.7 (2/75)	9.8 (4/41)
	5	Bin lid next to sink	1.3 (1/79)	0 (0/46)
	6	Drain	40 (26/65)	5 (2/40)
	7	Aerator/flow straightener	0 (0/61)	0 (0/44)
Toilet/bathroom	8	Toilet flush	0 (0/33)	0 (0/18)
	9	Toilet assist bar	0 (0/32)	0 (0/8)
	10	Toilet seat	2.9 (1/34)	0 (0/18)
	11	Floor by toilet	25.0 (7/32)	8.3 (1/12)
	12	Door handle	0 (0/36)	0 (0/19)
	13	Shower rose	0 (0/30)	0 (0/2)
	14	Shower head	0 (0/32)	0 (0/2)
	15	Shower seat	0 (0/22)	0 (0/1)
	16	Curtain	0 (0/25)	0 (0/1)
High-contact sites	17	Bed rail	0 (0/60)	0 (0/0)
	18	Nurse call button	0 (0/40)	0 (0/0)
	19	Keyboard	0 (0/54)	0 (0/6)
	20	Cleaner trolley	0 (0/12)	0 (0/6)
	21	Commode	0 (0/6)	0 (0/9)
	22	Door handle (room)	0 (0/6)	0 (0/9)
		Others	0 (0/62)	0 (0/19)
		Total	3.8 (38/1006)	1.6 (7/430)

- **Survival of hospital pathogens on dry hospital surfaces**

Organism	Survival time
Clostridium difficile (spores)	>5 Months
Acinetobacter spp	3 Days to 11 months^{79}
Enterococcus spp including VRE	5 Days to >46 months^{32}
Pseudomonas aeruginosa	6 Hours to 16 months
Klebsiella spp	2 Hours to >30 months
Staphylococcus aureus, including MRSA	7 Days to >12 months^{80}
Norovirus (and feline calicivirus)	8 Hours to >2 weeks^{81}

Transmission Based Precautions Literature Review: Environmental decontamination and terminal cleaning



Transmission Based Precautions Literature Review: Environmental decontamination and terminal cleaning

What is a terminal clean and why is it required?

A terminal clean is defined as: “a procedure required to ensure that an area has been cleaned/decontaminated following discharge of a patient with an infection (i.e. alert organism or communicable disease) in order to ensure a safe environment for the next patient.” (Mandatory Requirement therefore no grade of recommendation can be made)

When should terminal cleaning be carried out?

Terminal cleaning should be carried out after a patient with an alert organism or communicable disease has been discharged (or transferred), in order to ensure a safe environment for the next patient. (Mandatory requirement therefore no grade of recommendation can be made)

What additional steps are required for a terminal clean?

The NHS Scotland National Cleaning Services Specification should be followed with respect to terminal cleaning. (Mandatory Requirement therefore no grade of recommendation can be made) Bed screens, curtains and bedding should be removed prior to the room/area being decontaminated. (Good practice point (GPP))

Evidence Supporting the Role of the Contaminated Surface Environment in the Transmission of Several Key Healthcare-Associated Pathogens

- The **surface environment** in rooms of colonized or infected patients is frequently contaminated with the pathogen
- The pathogen is capable of **surviving** on hospital room surfaces and medical equipment for **a prolonged period of time**
- **Contact** with hospital room surfaces or medical equipment by healthcare personnel frequently leads to contamination of **hands and/or gloves**
- The frequency with which room surfaces are contaminated **correlates** with the frequency of hand and/or glove contamination of healthcare personnel
- Clonal outbreaks of **pathogens contaminating** the room surfaces of colonized or infected patients are demonstrated to be due to person-to-person transmission or shared medical equipment
- The patient admitted to a room previously occupied by a patient colonized or infected with a pathogen (eg, methicillin-resistant *Staphylococcus aureus*, vancomycin-resistant *Enterococcus*, *Clostridium difficile*, and *Acinetobacter*) has an **increased likelihood** of developing colonization or infection with that pathogen
- **Improved terminal cleaning of rooms** leads to a decreased rate of infections
- **Improved terminal disinfection** (eg, with vaporized hydrogen peroxide) leads to a decreased rate of infection in patients subsequently admitted to the room in which the prior occupant was colonized or infected

Isolating patients with healthcare associated infection

A summary of best practice(1/3)

- Isolation need risk assessment
 - Patient guidelines for isolation (single-room nursing and cohorts)
- Management of the patient once isolated
 1. Hand hygiene and personal protective equipment
 2. **Cleaning and decontamination**
 3. Movement



Isolating patients with healthcare associated infection

A summary of best practice(2/3)

Cleaning and Decontamination:

- **Equipment should be single-use only** – the equipment used for a patient in isolation, **should not be shared** with other patients.
- Multiple patient use equipment must be **decontaminated** between patients in accordance with local policy and the **manufacturer's instructions**.
- **Linen** should be treated as contaminated in line with hospital policy.
- All waste should be categorised as **hazardous waste** and disposed of in line with national guidance.
- Cleaning procedures should be rigorously applied and there should be procedures for enhanced and **terminal cleaning** in place that set out what these involve and when and how these should be used.
- It should be made clear to all staff exactly which teams and individuals are responsible for undertaking regular cleaning and **ensuring the cleaning procedures are adhered to**.
- All staff must be aware of **individual responsibilities** for undertaking regular cleaning (Refer to Decontamination policy) All staff including domestic staff must be aware of which rooms require terminal cleaning and when these have been completed.

Isolating patients with healthcare associated infection

A summary of best practice(3/3)

Local policies for environmental cleaning, equipment decontamination, waste and linen management should reflect required national specifications, and be rigorously applied. Compliance with these policies should be subject to regular monitoring and audits.



Healthcare Infection Control Practices Advisory Committee (HICPAC)

General Guidelines



The [Guideline for Disinfection and Sterilization in Healthcare Facilities, 2008](#) presents evidence-based recommendations on the preferred methods for cleaning, disinfection and sterilization of patient-care medical devices and for cleaning and disinfecting the healthcare environment.

[Guideline for Disinfection and Sterilization in Healthcare Facilities, 2008](#) [PDF - 948 KB]

Update: [Environmental Fogging Clarification Statement](#)



[2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings](#) This document is intended for use by infection control staff, healthcare epidemiologists, healthcare administrators, nurses, other healthcare providers, and persons responsible for developing, implementing, and evaluating infection control

programs for healthcare settings across the continuum of care. Complete PDF version available for download [Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings 2007](#) [PDF - 3.80 MB]

Note: The recommendations in this guideline for Ebola Virus Disease has been superseded by CDC's [Infection Prevention and Control Recommendations for Hospitalized Patients with Known or Suspected Ebola Virus Disease in U.S. Hospitals](#).

On this Page

- General Guidelines
- Device-associated Infection Prevention Guidelines
- Procedure-associated Infection Prevention
- Prevention and Control Drug-resistant Organisms in Healthcare Settings
- Healthcare Personnel
- NEW Antibiotic Stewardship Statement for Antibiotic Guidelines
- Flexible Endoscope Reprocessing

Guidelines for Environmental Infection Control in Health-Care Facilities

Recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC)



[Guidelines for Environmental Infection Control in Health-Care Facilities June 6, 2003 / 52\(RR10\):1-42](#) [PDF - 1.4 MB]

The *Guidelines for Environmental Infection Control in Health-Care Facilities* is a compilation of recommendations for the prevention and control of infectious diseases that are associated with healthcare environments.

Note: The recommendations in this guideline for Ebola Virus Disease has been superseded by CDC's [Infection Prevention and Control Recommendations for Hospitalized Patients with Known or Suspected Ebola Virus Disease in U.S. Hospitals](#) and by CDC's [Interim Guidance for Environmental Infection Control in Hospitals for Ebola Virus](#) issued on August 1, 2014.

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[Guidelines for Hand Hygiene in Healthcare Settings Published 2002](#)

[PDF - 496 KB] October 25, 2002 / Vol. 51 / No. RR-16

[Guideline for Hand Hygiene in Health-Care Settings, without Appendix](#)
[Guideline for Hand Hygiene in Health-Care Settings with Appendix](#)

Recent developments in the field have stimulated a review of the scientific data regarding hand hygiene and the development of new guidelines designed to improve hand-hygiene practices in health-care facilities.

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention (CDC)
Atlanta, GA 30333

醫療環境清潔指引

醫療機構環境清潔感染管制措施指引



衛生福利部疾病管制署

2015 年 11 月 2 日初版

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指引與實務操作的距離

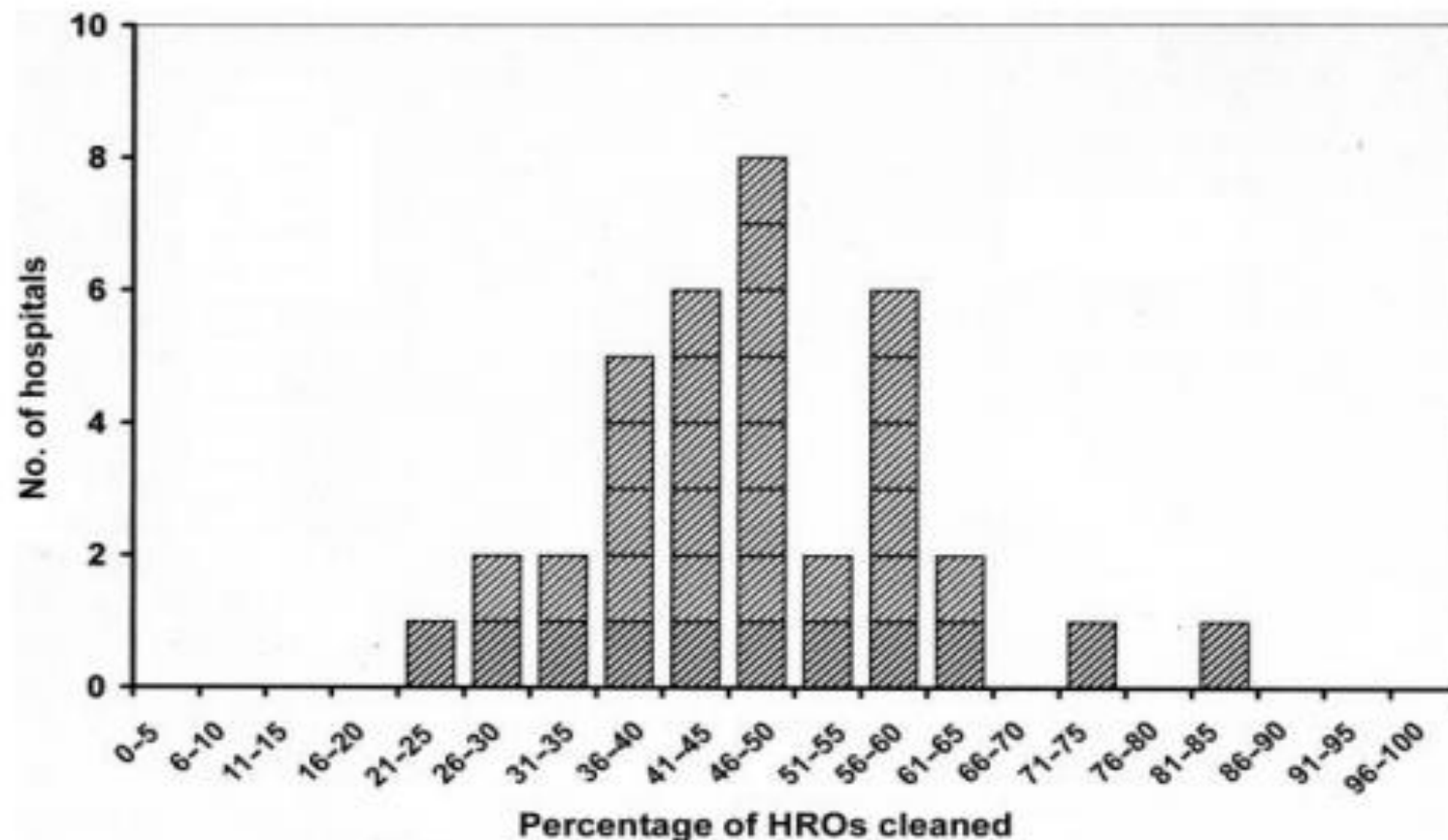
- 新病人的入院環境清潔檢查



ORIGINAL ARTICLE

Improving Cleaning of the Environment Surrounding Patients in 36 Acute Care Hospitals

Philip C. Carling, MD; Michael M. Parry, MD; Mark E. Rupp, MD; John L. Po, MD, PhD; Brian Dick, MS, CIC;
Sandra Von Beheren, RN, BSN, MS, CIC; for the Healthcare Environmental Hygiene Study Group



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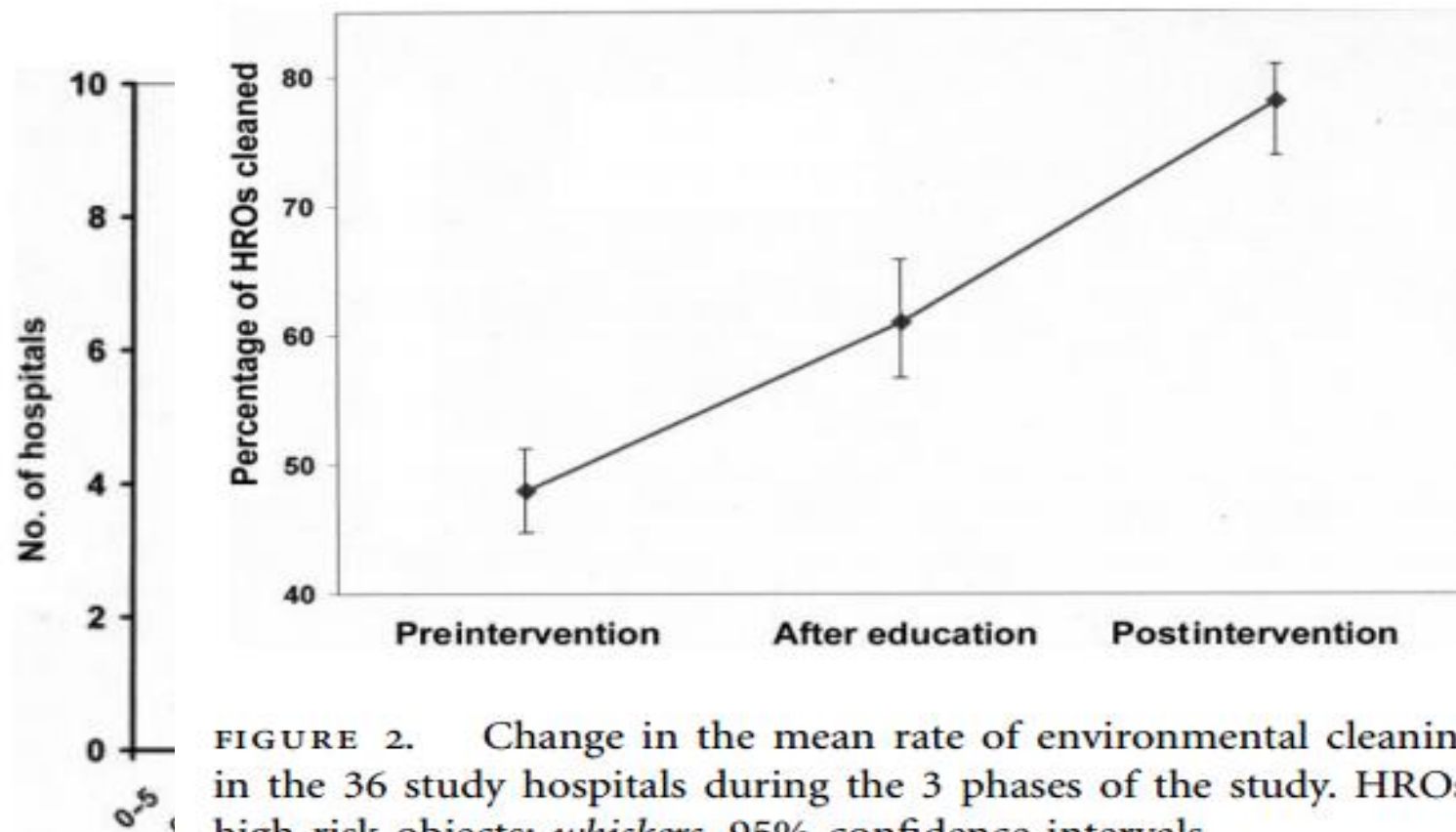


FIGURE 2. Change in the mean rate of environmental cleaning in the 36 study hospitals during the 3 phases of the study. HROs, high-risk objects; *whiskers*, 95% confidence intervals.

NOTE. All *P* values are <.001; CI, confidence interval.

台灣醫療院所面臨之環境清潔問題

1個病房1名清潔人員?

醫護清潔人員
人力不足

作業流程稽核?

清潔外包
品質難管理

有SOP，但落實度低

擦拭清潔用品
管理不易

分色管理知易行難

人員安全問題
易被忽視

環境清潔效能?
人員防護知能?



資料來源：金百利克拉克全台灣超過70家醫院問卷回收結果

清潔外包，品質難管理

醫護人員忙碌無法時時刻刻監督，通常由外包清潔組長自行管理

醫院難以管理其清潔工具之使用

外包人員教育素質不一，教育訓練品質有落差

許多外包清潔人員年紀偏高，執行力上有差距

清潔時間有限但工作繁瑣，無法有效落實

人員流動率高，知識無法累積需要不斷再教導，浪費資源



清潔流於形式，效果不佳
成為院內感染之隱藏高風險來源

清潔SOP落實度低

**SOP = Standard
Operating Procedure?**

**Sophisticated for
Operator to Process**

步驟流程繁瑣

人員素質差異

現行工具的限制



擦拭用品管理不易

沒有明確拋棄準則

- 擦拭產品使用一段期間後，擦拭效果會因泡製漂白水或長期使用而嚴重遞減
- 掉色之後影響原本之分色規劃
- 一條抹布擦到底，病菌從頭跟到尾

沒有理想的存放空間

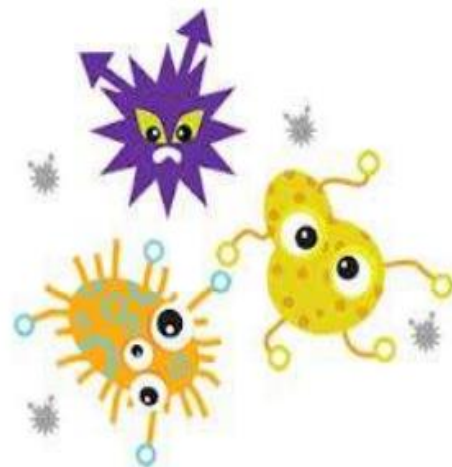
- 沒有有效乾燥成為病菌滋生的主要來源
- 沒有足夠的存放空間
- 共同存放成為交叉污染的主要原因

沒有明確選擇標準，品質/來源不一

- 各種材質/花色/顏色，影響清潔人員分類使用
- 來源不明，成為隱藏之高危險來源
- 材質不一或不好，嚴重影響擦拭效益



交叉感染





佛教慈濟醫療財團法人

花蓮慈濟醫院

Hualien Tzu Chi Hospital,

Buddhist Tzu Chi Medical Foundation

東區經驗

終期清潔問題與對策成效

1

清潔人力不足

估算清潔人力

清潔人力合理

2

作業流程不一

共識清潔程序

作業流程一致

3

人員認知不清

辦理教育訓練

人員認知正確

4

清潔效能不明

環境採檢測試

確認清潔效能

1.清潔人力合理

專人專車進行多重抗藥性病患終期清潔

- 專人為單位資深員工並經教育訓練合格人員進行清潔作業(名單於總務室備查)



針對MDRO終期清床種子人員名冊

項次	職稱	姓名	經 歷
1	股長	胡金菊	ICU、ER、OR、POR
2	副股長	林春香	TB、BMT、ER、OR
3	輔導員	陳宜君	ICU、ER、BMT及台大感控講習認證
4	維護員	張麗容	現任BMT、ICU、PI、RCC
5	維護員	劉雅文	現任ICU2、PI、RCC
6	維護員	王樹鎔	現任大/小夜、ICU
7	維護員	黃秀琪	ICU1、TB

2.作業流程一致

多重抗藥性環境清潔抹布管理改善措施

- 增加抹布使用數量。(一床使用10-12條抹布)
- 採購穩定性較高之NaDCC消毒錠提供使用
- 提供專用洗衣烘衣機設備(徹底清潔抹布並烘乾)
- 加強教育訓練(5/21及5/22舉辦共97人參加)
- 監測(ATP、Screen agar..)



◆ 專人專車/抹布送洗



針對MDRO終期清床種子人員名冊

項次	職稱	姓名	經歷
1	股長	胡金菊	ICU、ER、OR、POR
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5	維護員	劉雅文	現任ICU2、PI、RCC
6	維護員	王樹銘	現任大/小夜、ICU
7	維護員	黃秀琪	ICU1、TB



送洗作業順序：



STEP1
擰乾裝入
垃圾袋

STEP2
稱重
登記

STEP3
裝入黃色布包

STEP4
送至感恩樓
地下室

洗衣機作業順序：



專人清潔後，不需現場搓洗抹布，統一時段至洗衣機清洗。

STEP1
至洗衣機處

STEP2
選取所需水量

STEP3
倒入洗衣粉
及消毒錠

STEP4
待洗物
需帶手套

回收作業順序：



STEP1
感恩樓地下室
通知領回

STEP2
送至ISS
辦公室

STEP3
檢查數量
並檢整

STEP4
送至六西病房

- 消毒小餐桌▲、床邊矮櫃▲、置物櫃及椅子▲、檯車▲：
以浸泡調配好消毒劑之紅色抹布，擦拭及消毒用具。
- 傢俱消毒：
消毒房內的傢俱及窗台。包括電話、電線、桌椅等。將傢俱放回原來的
位置。

4. 人員認知正確



提供同仁可近性高之用具，維持環境清潔



提供臨床同仁拋棄式擦拭巾，每日進行加護單位鍵盤、電話及電腦之去移生擦拭。

另外包含移動式X光機、血液透析機及呼吸器之每日清潔擦拭使用。



4. 確認清潔效能

MDRO在住院環境的窩

- 103年3月開始進行多重抗藥性個案清床前後採檢
- 採檢床數11床

確定為抗藥性菌株類數-依病床並對照病人特性

採樣日期	病床號	病人特性
1030324	3A21-1	ORSA
1030328	2817-1	HCV(+)
1030328	2812-3	Clostridium difficile、 CRAB、ORSA
1030407	3A17-1	ORSA
1030407	2817-2	ORSA
1030409	3A05-1	ORSA
1030409	2813-2	E coli (ESBL)
1030411	3A01	VRE
1030411	3705-1	VRE
1030418	666-2	VRE
1030418	2657	VRE

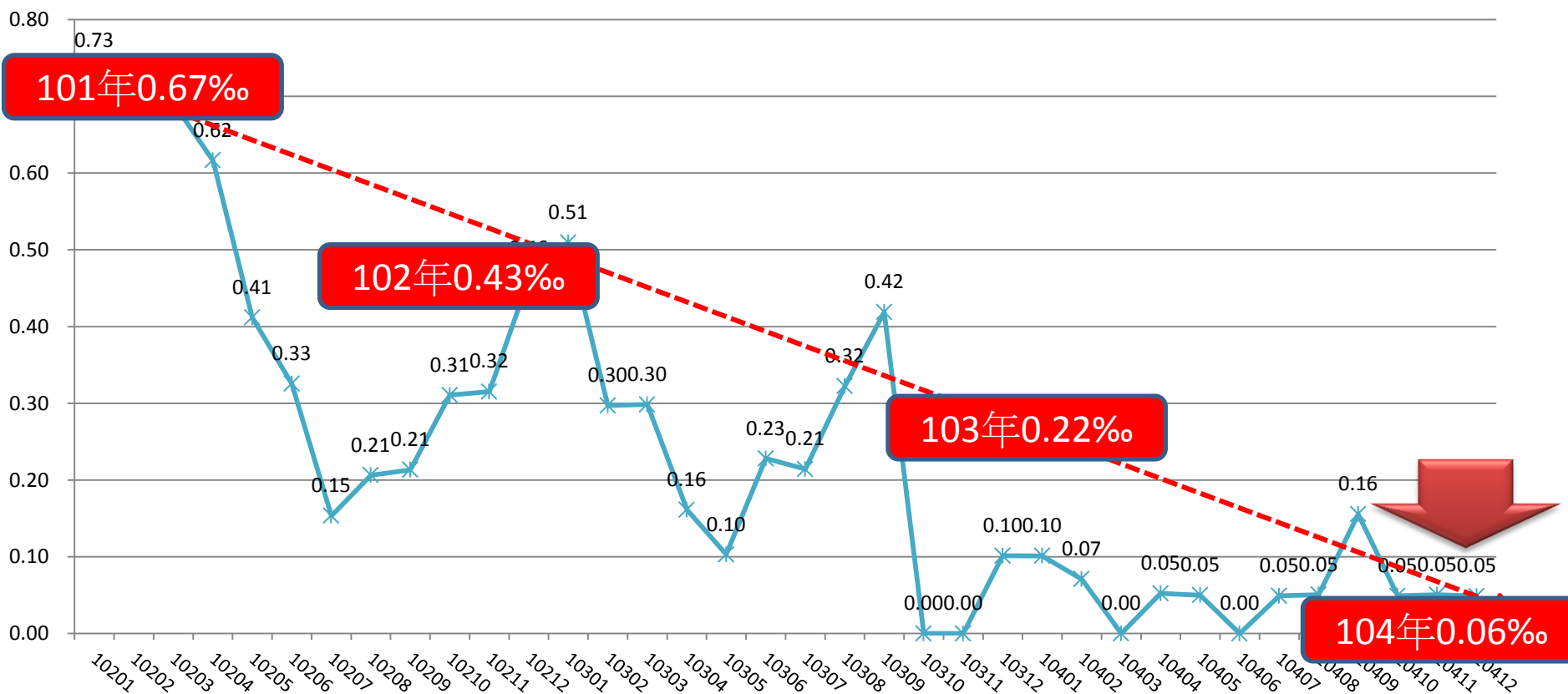




終期清潔之MDRO院感成效

102年至104年全院CRAB臨床檢體分離密度

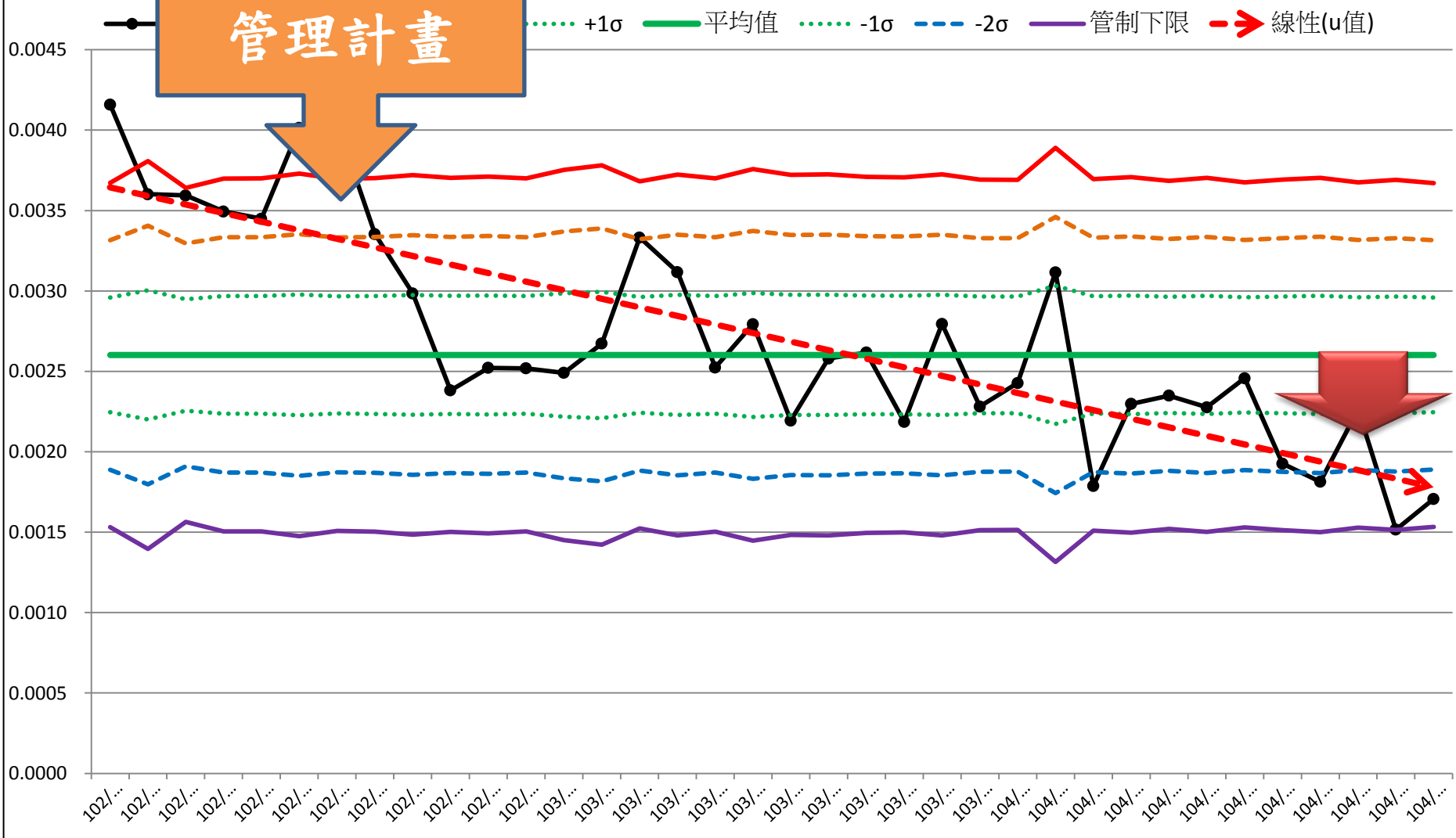
◆ 分離...





04醫療照護相關感染密度趨勢圖

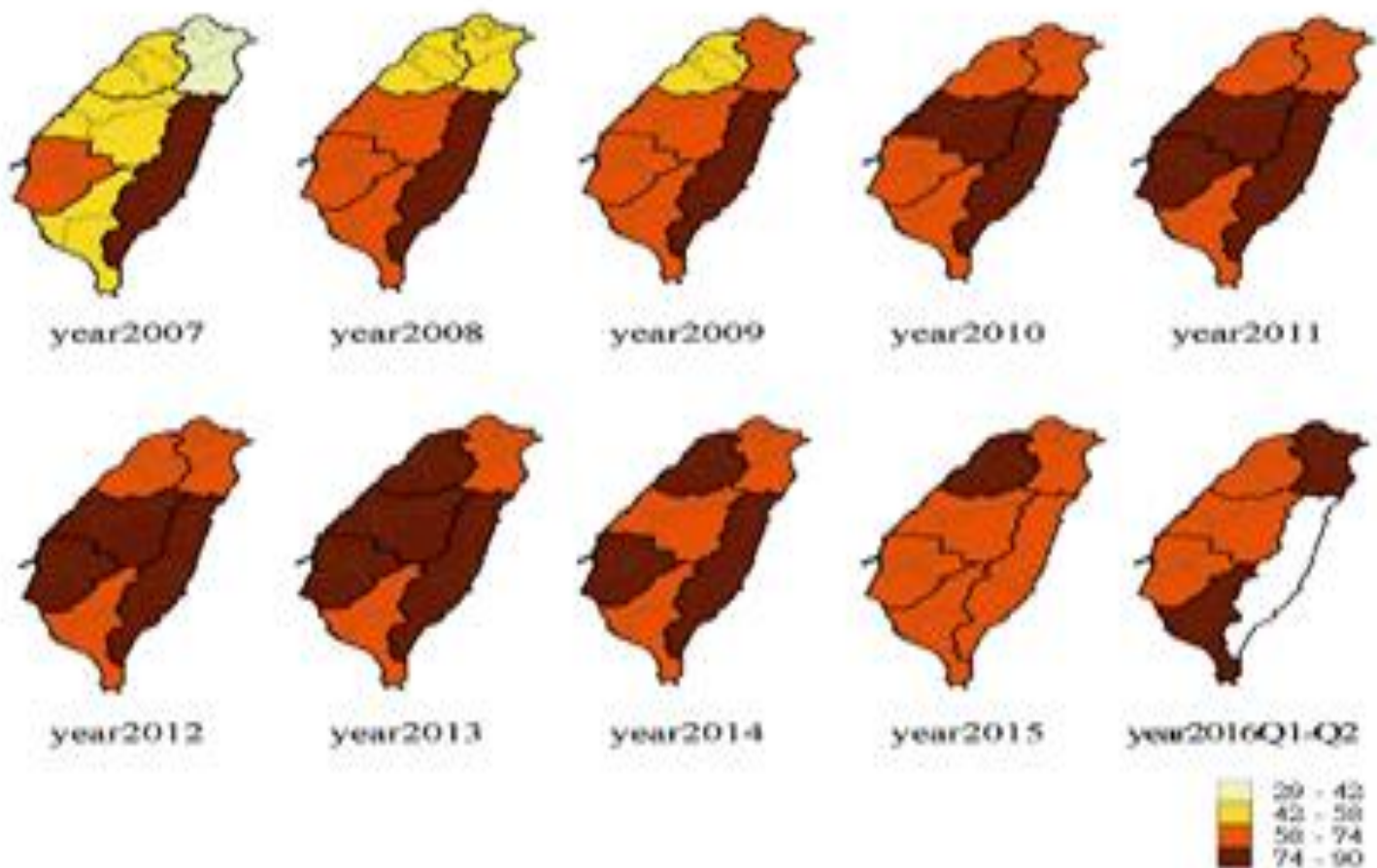
承接抗生素
管理計畫





還我淨土本色

2007 至 2016 年第 2 季，區域級以上醫院加護病房醫療照護相關感染 CRAB 比率在 6 個區域的分布如圖 6。於 2007 年以東區(78.3%)最為嚴重；2016 年第 2 季 CRAB 比率以台北區(75.7%)為最，高屏區(74.4%)次之。



限制與討論

- 單一機構的經驗, 依不同清潔公司合約而定
相關作業內容
- 人員訓練及作業稽核視各機構準則調整
- 效果維持與經費預算視每年的感染管制監視
視成果而異

結論

- 終期清潔對於院內感染防治有一定的貢獻
- 環境清潔是每位醫療團隊成員/訪客/病人都要重視/維持的習慣

感恩您的聆聽