

出國報告（出國類別：其他--國際會議）

參與「美國醫院流行病學 2017 春季年會」 之心得報告

服務機關：醫學研究部

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派赴國家：美國 聖路易斯城

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摘要

「美國醫院流行病學 2017 春季年會」於 3/27 - 3/31 在 St. Louis 城舉辦，此年會之目的是讓醫院感染控制的醫藥護理人員、醫院流行病學家、微生物學家能夠齊聚一堂，分享並討論關於院內感染防治、抗生素管控、抗藥性細菌感染等等重要議題。本人參加會議之目的有三：(一) 海報發表本人的研究成果；(二) 學習關於醫院院內感染的最新知識；(三) 建立和其他國外研究者學術合作的機會。在會議當中，本人聽取了許多關於抗生素管制、環境衛生、和困難梭狀桿菌感染的演講，也和多位研究者交流分享研究的想法與遇到的困難，並且建立未來可能的跨國合作機會，讓本人受益良多。希望未來本人能在臺中榮總有好的研究成果，之後再參與此會議與其他研究者分享臺灣的研究。

關鍵字：醫院流行病學、院內感染

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本文

一、 目的

本人此次參與「美國醫院流行病學 2017 春季年會」(The Society of Healthcare Epidemiology of America, SHEA 2017 Spring Conference) 的目的有三：(一) 海報發表本人的研究成果；(二) 學習關於醫院院內感染 (nosocomial infections) 的最新知識；(三) 建立和其他國外研究者學術合作的機會。

二、 過程

「美國醫院流行病學 2017 春季年會」於 3/29/2017 - 3/31/2017 舉辦在美國聖路易斯城 (St. Louis) 的凱悅飯店 (Hyatt Regency)，這是本人第三度參與「美國醫院流行病學春季年會」(<http://sheaspring.org/>)，也是本人自美國獲得博士學位返台之後第一度參加此年會。此年會之目的是讓負責醫院感染控制的醫藥護理人員、或是對於院內感染有興趣的流行病學家、微生物學家能夠齊聚一堂，分享並討論關於院內感染防治、抗生素管控、抗藥性細菌感染等等重要議題 (會議議程見附錄一)。本人之前在美國「愛荷華大學」的研究成果 (Effectiveness of Topical Vancomycin Powder in Decreasing Surgical Site Infections after Craniotomy) 獲得年會海報發表的肯定 (附錄二)，並且很幸運的申請獲得年會提供的 Bill Rutala 獎助金，能夠免費參與會議並且有旅遊的部分補助 (附錄三)。

在此次旅程中，本人先從臺灣搭長榮航空直飛芝加哥過一夜，隔早轉搭灰狗巴士至位於愛荷華州的「愛荷華大學」，和之前的博士班指導老師，也是知名的醫院流行病學家 Dr. Loreen Herwaldt 會合，再於會議開始前一天一同開車至聖路易斯城赴會。由於在事前我已經得知，有許多在美國時曾經合作過的感染科醫師和流行病學家都會參與會議，所以這次年會本人除了參與聽取演講課程，更有計畫的和其他人討論交流。

第一天的會議在早上八點就開始了，而且特別的是每一天的六點半到八點有安排不同主題的早餐討論會，本人第一天參加的早餐會是 International Meet and Greet Breakfast，參與的都是來自世界各地的醫院流行病學家，和不同國家的人交流得知各地都有不一樣的院內感染問題，尤其是在發展中國家的資源不足，有許多院內感染防治的方法或是治療都缺乏，但也值得學習該如何在資源缺乏的地方作到高水準的感染防治。開場的演講是由 Dr. Sara Cosgrove，也是 SHEA 的現任主席，談論 Antibiotic Stewardship (抗生素管理計畫) 的最新發展、政府規範、以及未來仍須努力的方向。她提到醫院執行抗

生素管理計畫能夠減少抗生素濫用、減少抗藥性細菌、進而降低醫療費用，而最終目的是提高病人安全。在美國，前任總統 Obama 在 2015 年已經簽署了國家型的行動計畫「National Action Plan for Combating Antibiotic Resistant Bacteria」，並且著重在於抗生素的管理使用，可見美國對於抗藥性細菌議題的重視，值得台灣借鏡。另外，Dr. Cosgrove 也強調了老年化社會會越來越需要在長期照護機構的感染控制，但長照機構的抗生素管理沒有被重視，臺灣尤其即將步入老年社會，我們更是需要人才往長照的感染控制方面耕耘。接著，本人參與的課程大多為美國 CDC 和 SHEA 合辦的 Hospital Epidemiologist 訓練課程，從入門開始介紹醫院流行病學的知識，包含醫院內感染常見的致病微生物，常見的院內感染可分為 Central line-associated bloodstream infection, ventilator-associated pneumonia, surgical site infection, urinary tract infection 等等，如何進行院內感染監測，介紹抗生素管理計畫等等議題。晚餐時，本人和十多位來自「愛荷華大學醫院」以及「愛荷華州榮民醫院」的合作夥伴聚會，交流經驗和想法，也談到未來願意繼續合作。

第二天的早餐是 SHEA Epi Competition Breakfast，由五位脫穎而出的研究者報告提出自己的計畫，以競爭獲得\$20,000 美金的經費來進行研究。接著本人聆聽了關於感控監測、醫院環境衛生、以及醫護人員個人防護措施 (Personal Protective Equipment) 的多個研究摘要報告，其中令本人印象深刻的研究是探討「可移動式儀器」的受污染程度，並認為可能是傳播病菌的來源之一，醫院中可攜式儀器包括了 X-ray machine、ultrasound machine、手提式電腦、血壓機等等，這些儀器往往落入三不管地帶，不確定哪些人該清理，並且清理的程序可能沒有一致性，造成清潔不完全甚至沒有清潔，而變成傳染源之一 (附錄四之一)。下午的演講是此會議的壓軸之一，由 Dr. Matthew Kreuter 談論

「Understanding How to Change Behavior」，由社會科學家的角度來探討如何能夠說服並改變醫療人員的行為，譬如手部衛生、接種流感疫苗、適當的給予抗生素處方等等，以降低院內感染的風險。他談到，這些行為看似簡單、重複，但卻難以長期並有效的讓醫護人員接受，這些行為共同的特點是進行行為後直接受益人都是「他人」而非醫護人員「本人」，而若沒有進行這些行為受害的也都是「他人」，有些行為不是在公開的場合可以被觀測到的，另外這些行為很容易被同儕或環境所影響。講者分享，必須要找出對於醫護人員覺得有意義的好處，並且讓醫護人員了解不改變這些行為對於病人可能造成嚴重後果，使用病人的個人故事讓醫護人員覺得這樣的問題是實際上會發生的，也可能發生在自己身上的，進而願意改變 (附錄四之二)。我們研究者可能常常急著想用科學上的證據去說服醫護人員改變行為，但是卻忽略了醫護人員也都只是個「人」，若要實施改變，必須先站在醫護人員的觀點去看待，

才有可能有效並且長久。中午吃飯時間是本人的海報展時間，我匆匆的拿了餐盒便衝到海報前準備，我之前在美國的研究是探討 **Topical vancomycin powder** 能否降低開顱手術的手術後傷口感染機率（附錄二），好幾位醫院流行病學家和感控師都來討論他們醫院的神經外科醫師使用 **Topical vancomycin powder** 的狀況，也表達使用這抗生素粉末的擔憂。更有位美國 CDC 人員說要和 CDC 中負責手術後感染的團隊分享我的研究，看能否進行全美的調查。第二天下午的另一個收穫就是從一位感染科的醫師也是優秀的研究人員 **Dr. Michi Goto** 得知，有完整的 **Machine Learning** 的線上課程讓本人可以自學這方面的知識，這套課程是由美國 **Standford** 大學的兩位教授所提供，很受好評

(<http://www.dataschool.io/15-hours-of-expert-machine-learning-videos/>)。由於現在是大數據時代，越來越需要資料分析人才，尤其若能夠用電腦 **Machine learning** 自動學習分析病歷資料，來預測哪些病人是感染的高危險群，或是依照各個病人的狀況給醫生下最好的治療建議，應能使個人化醫療再往前推進。

第三天的早餐會是只給女性參加的 **SHEA Women in Epi Breakfast**，這個早餐會不討論科學，而是討論並分享女性在職場上遇到的歧視、忽略、被邊緣化及其他問題，會中談到其實某些歧視不只是男性對於女性的歧視不友善，而是女性對於其他女性的歧視不友善，女性應該要當彼此的後盾，幫助彼此而非壓制彼此。本人其實很驚訝許多參與的女性都已經是醫院流行病學上的領導人物，她們卻也會遇到這些問題，讓本人很感激也敬佩她們的分享。這天聽了幾場關於 **Clostridium difficile infection** (困難梭狀桿菌感染) 的演講，困難梭狀桿菌感染會引起嚴重的腹瀉，且多是由於之前使用抗生素造成腸道內菌種生態 (**microbiome**) 不平衡，使得困難梭狀桿菌大量增生而引發嚴重感染，得了困難梭狀桿菌感染的病人常常會復發，並且嚴重可致死，所以困難梭狀桿菌感染被美國 **CDC** 列為嚴重威脅的菌種。本人回台灣後發現，在台灣困難梭狀桿菌感染的研究稀少，並且多為小規模的病例研究，並且困難梭狀桿菌感染仍不屬於需要通報的院內感染，所以在台灣困難梭狀桿菌感染的流行病學並不清楚。本人希望能投入這方面的研究，故這幾場演講對本人助益很大。會議結束後，本人便離開 **St. Louis**，和指導教授 **Dr. Herwaldt** 驅車返回愛荷華州，路上討論了幾個本人未來想要在臺中榮總作的研究方向，而 **Dr. Herwaldt** 也很慷慨的給了許多寶貴建議，也樂意未來繼續的合作。回到愛荷華州隔兩天我們又驅車前往芝加哥，本人在美國時間 4/3 凌晨從芝加哥起飛返回台灣，結束了這趟豐碩的旅程。

三、心得

這趟旅程成果豐碩，除了知識上的充實、也有社交上的拓展，讓我再次充滿作研究的能量、確認未來研究的方向。許多心得本人已經寫在「過程」當中，簡而言之，醫院流行病學中最重要的就是抗生素的管制，這方面臺灣有許多能夠進步的空間，並且台灣即將邁入高齡社會，必須要注重長照機構中的感染防治議題。另外，要執行感染控制的政策，必須要回到「人」的根本面去設想，才有可能有效的改變醫護人員的習慣行為，促進病人健康安全。並且，在作大數據研究方面，臺灣的優勢是有健保資料庫和其他全國性的大型資料庫，能夠使用 **Machine learning** 的方法去探討或是改進院內感染監測、抗生素管控等等的問題。最後，困難梭狀桿菌感染的在台灣의 流行程度和病人預後狀況需要更多的研究。

四、建議事項（包括改進作法）

由於本人去年八月才剛搬回臺灣，在此次會議之前尚未有較完整的研究結果，而仍是使用過去在美國的研究來報告。希望之後能夠在臺中榮總使用健保資料庫、CDC 院內感染資料庫、和臨床資料庫來完成好的研究，再來參與未來的 **SHEA** 會議跟其他國家的人分享臺灣的研究。

附錄

一、會議議程

	Wednesday, March 29					Thursday, March 30					Friday, March 31																		
7:00 AM	Mentorship Meet & Greet Breakfast - <i>By Invitation Only</i>		Networking Morning Coffee			Epi Competition Breakfast					Women in Epi Breakfast		Networking Breakfast with Poster Viewing																
8:00 AM	Opening Plenary: A Rapidly Changing Field					CDC Problem Sessions		Update on National Stewardship Activities		Infection Prevention Parallels from Pediatric to Geriatrics		Oral Abstract Presentations		Leadership and Communication Skills		Case Study #2: Stewardship and C. Difficile Infection		Applying Novel Educational Strategies to Infection Prevention Control & Antibiotic Stewardship Programs		Oral Abstract Presentations									
8:15 AM						Transmission of Infectious Agents in Healthcare Settings		Breakout Session: Beginning Antibiotic Stewardship Strategies & Measurement		Breakout Session: Advanced Antibiotic Stewardship Strategies & Measurement		Implementation Science 201: Practical Implementation Strategies		Dollars & Cents of Infection Prevention: Methods to Quantify Cost Effectiveness of Interventions		Approach to Epidemic/ Outbreak Investigation		Integration of the Microbiology Lab & Antibiotic Stewardship: Beginning Concepts		Occupational Health Issues		Management of Resistant Gram Positive Infections		Evolving Requirements for Surveillance, Reporting & Payment: What do Providers Need to Know?					
8:30 AM																Introduction to Healthcare Epidemiology		Problem Session: Outbreak in the OR		HAI Improvement Forum: Cutting Edge Interventions to Reduce HAI		Scholarship & Antibiotic Stewardship: What's Needed and How to Contribute?				Management of Resistant Gram Negative Infections		Challenging Cases in Infection Prevention	
8:45 AM																Unique Aspects of Pediatric Infection Control		Rapid Diagnostic Tests and How to Implement their use: Mini-Lecture & Case Study		The Role of the Laboratory in Healthcare Epidemiology		The Never Events: Managing Provider & Patient Expectations							
9:00 AM	Networking Break					Networking Break					Networking Break																		
9:15 AM	Networking Break					Networking Break					Networking Break																		
9:30 AM	Networking Lunch with Poster Presentations					Networking Lunch with Poster Presentations					Networking Lunch with Poster Presentations																		
10:00 AM	Practical Strategies for Surveillance		What Every Steward Should Know About Pharmacokinetics - Pharmacodynamics		Is the Juice Worth the Squeeze: Should CAUTI Prevention be a Top Priority?		Oral Abstract Presentations		Plenary: May the Forces be with You: Understanding How to Change Behavior					How to Read a Study & Perform Research		Case Studies #3: Adult Case: Intervention to Improve Management of Community-Acquired Pneumonia		Is it Good to Know: Universal Surveillance for C. Difficile?		Crossing the Continuum Hospital Post-Acute & Long-Term Care Community									
10:15 AM	The Compendium Strategies for Preventing HAIs		Antibiotic Stewardship: Navigating the Liability Risks		Break		Break		Break		Break		Break		Business of Infection Prevention: Promoting Growth of a Program		Case Studies #4: Pediatric Case: Intervention to Improve Antibiotic Use in Pediatrics & the NICU												
10:30 AM															Regulatory & Emergency Preparedness		Case Studies: Adult Case: #5 Intervention to Improve Antibiotic Use in the Immunocompromised		Pathogens Versus Problems		Oral Abstract Presentations								
10:45 AM															Putting it all Together		Where to go from Here: Maintaining Internal & External Support												
11:00 AM	Change Management and the Science of Safety		An Update on Duration of Therapy & Therapeutic Monitoring: Our Role as Stewards		Building the Hospital Epidemiologist & Infection Prevention Team for Optimal Practice (Building Through Team Work)		Healthcare Epidemiology in Resource-Limited Settings		Post-Acute & Long-Term Care: Changing the National Landscape and Infection Prevention		The Role of the Infection Preventionist		Beyond the Standards: Should We Do More Than Currently Recommended for Endoscope Reprocessing?		Oral Abstract Presentations		Regulatory & Emergency Preparedness		Case Studies: Adult Case: #5 Intervention to Improve Antibiotic Use in the Immunocompromised		Pathogens Versus Problems		Oral Abstract Presentations						
11:15 AM	Root Cause Analysis Practical Session		Allergies, Interactions and Adverse Events		Break		Break		Environment, Sterilization & Disinfection		Telemedicine: Opportunities in Stewardship		Break		Break		Break		Break										
11:30 AM	Overview of Antibiotic Stewardship		Developing an Antibiotic Stewardship Program in the Long-Term Care Settings		Patients, Families & Prevention		Oral Abstract Presentations		Special Populations: Immunocompromised, ICU, Dialysis & Burn Patients		Informatics & Stewardship		What Lies Beneath: Detecting & Responding to Emerging MDRO's with both Eyes Covered		International Infection Prevention & Antimicrobial Stewardship Efforts		Closing Plenary: Preparing for the Future Ends at 5:45 PM												
11:45 AM	Managing Outlier Physicians		Break		Break		Break		Break		Break		Break		Break		Closing Plenary: Preparing for the Future Ends at 5:45 PM												
12:00 PM	Networking Lunch with Poster Presentations					Networking Lunch with Poster Presentations					Networking Lunch with Poster Presentations																		
12:30 PM	Networking Lunch with Poster Presentations					Networking Lunch with Poster Presentations					Networking Lunch with Poster Presentations																		
1:30 PM	The Compendium Strategies for Preventing HAIs		Antibiotic Stewardship: Navigating the Liability Risks		Break		Break		Break		Break		Break		Break		Break		Break										
1:45 PM	Change Management and the Science of Safety		An Update on Duration of Therapy & Therapeutic Monitoring: Our Role as Stewards		Building the Hospital Epidemiologist & Infection Prevention Team for Optimal Practice (Building Through Team Work)		Healthcare Epidemiology in Resource-Limited Settings		Post-Acute & Long-Term Care: Changing the National Landscape and Infection Prevention		The Role of the Infection Preventionist		Beyond the Standards: Should We Do More Than Currently Recommended for Endoscope Reprocessing?		Oral Abstract Presentations		Regulatory & Emergency Preparedness		Case Studies: Adult Case: #5 Intervention to Improve Antibiotic Use in the Immunocompromised		Pathogens Versus Problems		Oral Abstract Presentations						
2:00 PM	Root Cause Analysis Practical Session		Allergies, Interactions and Adverse Events		Break		Break		Environment, Sterilization & Disinfection		Telemedicine: Opportunities in Stewardship		Break		Break		Break		Break										
2:15 PM	Overview of Antibiotic Stewardship		Developing an Antibiotic Stewardship Program in the Long-Term Care Settings		Patients, Families & Prevention		Oral Abstract Presentations		Special Populations: Immunocompromised, ICU, Dialysis & Burn Patients		Informatics & Stewardship		What Lies Beneath: Detecting & Responding to Emerging MDRO's with both Eyes Covered		International Infection Prevention & Antimicrobial Stewardship Efforts		Closing Plenary: Preparing for the Future Ends at 5:45 PM												
2:30 PM	Managing Outlier Physicians		Break		Break		Break		Break		Break		Break		Break		Break		Break										
2:45 PM	Change Management and the Science of Safety		An Update on Duration of Therapy & Therapeutic Monitoring: Our Role as Stewards		Building the Hospital Epidemiologist & Infection Prevention Team for Optimal Practice (Building Through Team Work)		Healthcare Epidemiology in Resource-Limited Settings		Post-Acute & Long-Term Care: Changing the National Landscape and Infection Prevention		The Role of the Infection Preventionist		Beyond the Standards: Should We Do More Than Currently Recommended for Endoscope Reprocessing?		Oral Abstract Presentations		Regulatory & Emergency Preparedness		Case Studies: Adult Case: #5 Intervention to Improve Antibiotic Use in the Immunocompromised		Pathogens Versus Problems		Oral Abstract Presentations						
3:00 PM	Root Cause Analysis Practical Session		Allergies, Interactions and Adverse Events		Break		Break		Environment, Sterilization & Disinfection		Telemedicine: Opportunities in Stewardship		Break		Break		Break		Break										
3:15 PM	Overview of Antibiotic Stewardship		Developing an Antibiotic Stewardship Program in the Long-Term Care Settings		Patients, Families & Prevention		Oral Abstract Presentations		Special Populations: Immunocompromised, ICU, Dialysis & Burn Patients		Informatics & Stewardship		What Lies Beneath: Detecting & Responding to Emerging MDRO's with both Eyes Covered		International Infection Prevention & Antimicrobial Stewardship Efforts		Closing Plenary: Preparing for the Future Ends at 5:45 PM												
3:30 PM	Managing Outlier Physicians		Break		Break		Break		Break		Break		Break		Break		Break		Break										
3:45 PM	Change Management and the Science of Safety		An Update on Duration of Therapy & Therapeutic Monitoring: Our Role as Stewards		Building the Hospital Epidemiologist & Infection Prevention Team for Optimal Practice (Building Through Team Work)		Healthcare Epidemiology in Resource-Limited Settings		Post-Acute & Long-Term Care: Changing the National Landscape and Infection Prevention		The Role of the Infection Preventionist		Beyond the Standards: Should We Do More Than Currently Recommended for Endoscope Reprocessing?		Oral Abstract Presentations		Regulatory & Emergency Preparedness		Case Studies: Adult Case: #5 Intervention to Improve Antibiotic Use in the Immunocompromised		Pathogens Versus Problems		Oral Abstract Presentations						
4:00 PM	Root Cause Analysis Practical Session		Allergies, Interactions and Adverse Events		Break		Break		Environment, Sterilization & Disinfection		Telemedicine: Opportunities in Stewardship		Break		Break		Break		Break										
4:15 PM	Overview of Antibiotic Stewardship		Developing an Antibiotic Stewardship Program in the Long-Term Care Settings		Patients, Families & Prevention		Oral Abstract Presentations		Special Populations: Immunocompromised, ICU, Dialysis & Burn Patients		Informatics & Stewardship		What Lies Beneath: Detecting & Responding to Emerging MDRO's with both Eyes Covered		International Infection Prevention & Antimicrobial Stewardship Efforts		Closing Plenary: Preparing for the Future Ends at 5:45 PM												
4:30 PM	Managing Outlier Physicians		Break		Break		Break		Break		Break		Break		Break		Break		Break										
4:45 PM	Change Management and the Science of Safety		An Update on Duration of Therapy & Therapeutic Monitoring: Our Role as Stewards		Building the Hospital Epidemiologist & Infection Prevention Team for Optimal Practice (Building Through Team Work)		Healthcare Epidemiology in Resource-Limited Settings		Post-Acute & Long-Term Care: Changing the National Landscape and Infection Prevention		The Role of the Infection Preventionist		Beyond the Standards: Should We Do More Than Currently Recommended for Endoscope Reprocessing?		Oral Abstract Presentations		Regulatory & Emergency Preparedness		Case Studies: Adult Case: #5 Intervention to Improve Antibiotic Use in the Immunocompromised		Pathogens Versus Problems		Oral Abstract Presentations						
5:00 PM	Root Cause Analysis Practical Session		Allergies, Interactions and Adverse Events		Break		Break		Environment, Sterilization & Disinfection		Telemedicine: Opportunities in Stewardship		Break		Break		Break		Break										
5:15 PM	Overview of Antibiotic Stewardship		Developing an Antibiotic Stewardship Program in the Long-Term Care Settings		Patients, Families & Prevention		Oral Abstract Presentations		Special Populations: Immunocompromised, ICU, Dialysis & Burn Patients		Informatics & Stewardship		What Lies Beneath: Detecting & Responding to Emerging MDRO's with both Eyes Covered		International Infection Prevention & Antimicrobial Stewardship Efforts		Closing Plenary: Preparing for the Future Ends at 5:45 PM												
5:30 PM	Managing Outlier Physicians		Break		Break		Break		Break		Break		Break		Break		Break		Break										

*There will be a Foundation Dinner on Thursday at 6:00 p.m. Extra Ticket Purchase.

二、海報發表

Effectiveness of Topical Vancomycin Powder In Decreasing Surgical Site Infections after Craniotomy

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Background

- The effect of topical vancomycin powder (VP) on surgical site infection (SSI) rates after craniotomy has not been carefully studied.
- In 2011, neurosurgeons at the University of Iowa Hospitals and Clinics (UIHC) began using VP during craniotomies.

Objective

- To conduct a retrospective cohort study assessing the association between intraoperative topical VP application and SSI rates after craniotomy at the UIHC.

Methods

Study population:

- Adult craniotomy procedures performed during 2011-2015.
- For patients who had > 1 craniotomy during the same admission, we included the first craniotomy during that hospitalization.
- For patients who had 1 craniotomy per admission during more than 1 admission, we included all craniotomies.

Data collection:

- All data were obtained from the UIHC's electronic data warehouse.
- Exposure: VP use was defined as topical VP administration while the wound was open; each VP use was verified.
- Outcome: SSI meeting the National Healthcare Safety Network definition were identified through routine surveillance.

Data analysis:

- Bivariable analyses: We compared characteristics between procedures in which VP was applied (VP group) and those in which VP was not applied (non-VP) using the *Chi*-square test for categorical factors and the *t*-test for continuous factors.
- Multivariable analysis: We assessed the association between VP use and SSI in a multivariable logistic regression model.
- All tests were two-tailed and the level of significance was 0.05.

Results

- 2,788 craniotomies: VP Group 1,040 (37.3%) and non-VP Group 1,748 (62.7%).
- SSI: 51 of 2,788 craniotomies (pooled SSI rate 1.8%)
- 46 (90%) were deep incisional or organ/space SSI (i.e., complex).
- 15 (29%) were caused by *Staphylococcus aureus*.
- The VP and non-VP groups were similar with respect to gender, ethnicity, body mass index, prep length of stay, American Society of Anesthesiologists Score, and β -lactam allergy.
- The VP group was younger than the non-VP group but they had more comorbidities, their procedures were longer, and their intraoperative blood loss was greater (Table 1).

Table 1. Comparison of patient characteristics – Bivariable analysis

Variable	VP (%) N = 1,040	Non-VP (%) N = 1,748	p-value
Age (year) ^a	55.1 ± 16.0	58.1 ± 17.8	<0.0001
Smoking history	311 (29.9)	445 (25.5)	0.01
Charlson comorbidity score ≥ 2	457 (43.9)	568 (32.5)	<0.0001
Paralysis	113 (10.9)	149 (8.5)	0.04
Tumor	337 (32.4)	333 (19.1)	<0.0001
Scheduled procedure	695 (66.8)	949 (54.3)	<0.0001
Intraoperative blood loss (mL) ^{a,b}	237 ± 294	196 ± 367	0.002
Operation duration (minute) ^a	209 ± 113	175 ± 127	<0.0001

a. Mean ± standard deviation was presented.

b. Data were available for N = 1,005 in VP group and N = 1,616 in non-VP group.

Results – cont.

Table 2. Intraoperative VP and SSI – Multivariable analysis

SSI	VP (%) N = 1,040	Non-VP (%) N = 1,748	Adjusted OR (95% CI) ^a	p-value
Any SSI	13 (1.25)	38 (2.17)	0.58 (0.30, 1.11)	0.10
Complex SSI	12 (1.15)	34 (1.95)	0.60 (0.30, 1.20)	0.15
<i>S. aureus</i> SSI	4 (0.38)	11 (0.63)	0.64 (0.20, 2.11)	0.47
Complex <i>S. aureus</i> SSI	4 (0.38)	10 (0.57)	0.72 (0.22, 2.41)	0.59

a. Adjusted for age, smoking history, paralysis, tumor, scheduling, blood loss, and operation duration.

Abbreviations: CI, confidence interval; OR, odds ratio; SSI, surgical site infection; VP, vancomycin powder.

Conclusions

- After adjusting for potential confounders, the incidence of any SSI, complex SSI, *S. aureus* SSI, or complex *S. aureus* SSI was lower by ~40% in the VP group but these associations were not statistically significant.
- VP application may not provide a major benefit in preventing SSI in the surgical populations that have relatively low SSI rates.
- Further study is needed to assess the benefit of VP in preventing SSI after craniotomy in patients with a high risk of SSI.

Acknowledgement

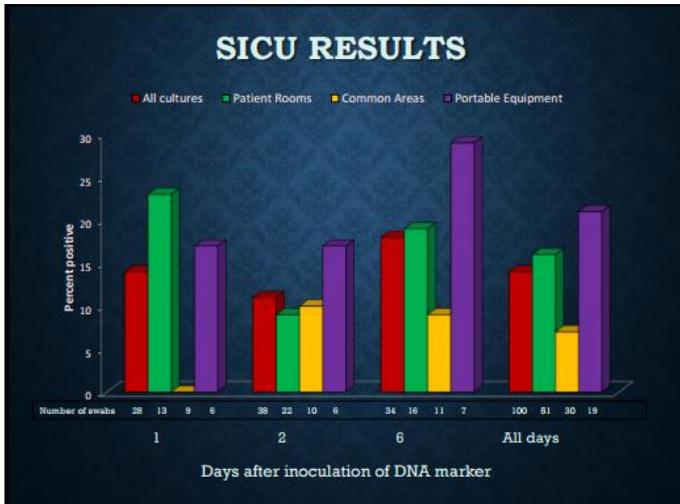
- The authors thank Alison Klaasen for obtaining patient and procedure data and Jean Pottinger for providing SSI data.

三、獎狀



四、他人研究

四之一、Contaminated Portable Equipment is a Potential Vector for Dissemination of Pathogens in the Intensive Care Unit. (03/30/2017 Oral Abstract Session)



四之二、Understand How to Change Behavior (03/30/2017 Plenary)

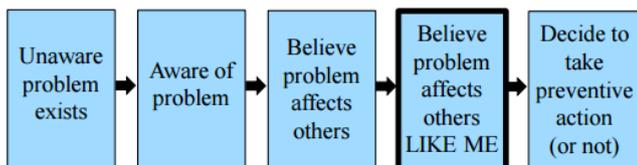
What characterizes these behaviors?

- Benefits of change accrued by *someone else*
- Consequences of inaction felt by *someone else*
- Consequences often can't be linked to "offender"
- Some behaviors occur in private settings
- Strong *social* component to many of the behaviors



Precaution Adoption Process Model

(Weinstein, 1992)



五、與 St. Louis 著名的 Gateway Arch 合影留念

