



Lecture Notes: The Importance of Nurse Empowerment.

Theme: It is not the Nurses' Fault

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Slide 1: Thank you very much, I'm Dr. Kevin Kavanagh from Health Watch USA. Health Watch USA is a patient advocacy and healthcare policy research organization founded over 10 years ago.

Slide 2: I wish to talk to you about the importance of nurse empowerment with the overall theme of "It's Not The Nurses' Fault. There is no doubt that nurses face the daunting task of safeguarding the health, healthcare and safety of both themselves and patients.

There is no better testament to this problem than the recent Ebola epidemic – where initially it was stated that any hospital could safely take care of Ebola.

At the same time in a Lexington Herald Leader OpEd HW USA was calling for better standardization of practices and a need to take dangerous pathogens more seriously.

And then, a nurse, Nina Pham become infected with Ebola.

Slide 3: Initially, she was blamed for her own infection, but it was soon learned there were ineffective standards with lack of appropriate PPE. A fully hooded hazmat suit was not available in the hospital.

Slide 4: Since then, steps are being taken to emphasize containment and control of dangerous pathogens. On June 19, 2018, the CDC reaffirmed that Isolation of carriers, those infected with MRSA, is key to controlling spread of this dangerous pathogen.

However, many of our protocols to safeguard healthcare workers and patients from MRSA are based on a misinterpretation of the literature and two poorly designed studies.

In 2003, European Researchers, Cooper, et al.– found that most studies supporting surveillance and isolation of MRSA carriers were before and after studies. However, they recommend staying the course. But, the U.S. decided to veer off course and abandon this time tested prevention intervention.

The United States backed up their decision not to do surveillance for MRSA carriers with two studies which appear to have major design flaws.

- 1) Harbarth, et al., in JAMA where appropriate MRSA prophylaxis was not given to the majority of patients in the intervention group.
- 2) Huskins, et al., in NEJM where it took 5 days to get back the culture results and start patient isolation procedures. In addition, contact precautions were not strictly followed.

Slide 5: The United Kingdom instituted a hand hygiene campaign and mandatory screening and isolation for MRSA and saw a phenomenal decrease in infections. **This figure illustrates the percentage of MRSA in *Staph Aureus* cultures in Europe.** The United Kingdom is the purple line. They saw over a 60% decrease in methicillin resistance in *Staphs aureus* cultures. Along with a concomitant decrease in MRSA bloodstream infections but NOT in MSSA or E. Coli bloodstream infections.

Hand hygiene was performed across the board and should have impacted all pathogens. But only MRSA infections, which also had implementation of screening for carriers showed a decrease.

<https://reflectionsipc.com/2015/03/03/the-english-mrsa-miracle/>

“...a series of ‘high-impact interventions’ focused mainly on good line care in 2006 and revised national guidelines in 2006 (including targeted screening, isolation and decolonization) all contributed to a surge of interested infection control.”

There is no guarantee that hand washing alone will be effective.

In the context of multi-drug resistant organisms, hand hygiene should be viewed as a backup measure since these organisms should not be on a healthcare workers’ hands in the first place.

Slide 6: This graph shows data which HW USA published in ARIC. The orange line is derived from NHSN data and shows an increase in severe MRSA infections in 2015 in US Private Sector Hospitals. The blue asterisks show the huge decrease in MRSA in VA Hospitals. The VA screens all admissions for MRSA.

However, the baselines are not comparable. The 2015 increase may be due to changes in how the US accounts for Community MRSA. Infections occurring at the onset of hospitalizations are defined as “community.” This capture time changed from 2 days to 3 days after hospital admission.

Hospital rates are adjusted for community rates. They are also adjusted for being a teaching institution and bed size.

Thus, rates of infections and risk adjustment are more for hospital performance and accountability than the risk of workers and patients actually contracting the organisms.

Slide 7: Next we had a shift in policy to using chlorhexidine bathing. This was largely based on one study, The REDUCE MRSA Study, which has a number of reporting and data analysis aberrations.

- 1) There was confusion that their first group tested for the effectiveness of screening. But both the control and intervention groups had the same treatment. It was used to control for change which occurred over time (secular trends).
- 2) The primary objective was the number of MRSA isolates and not infections.
- 3) What was measured was changed. After the trial complete date, the “All Pathogen Bloodstream Infection” category was added. BUT this is a composite category and by far the main effect was on yeast and commensal bacteria, such as Staph Epi.

Slide 8: A well known researcher on the MRSA study was reported by Reuters to have at least an appearance of COI with the manufacture of the chlorhexidine product they were testing. (Huang SS. Abstract 1000. Presented at: ID Week; Oct. 4-8, 2017 San Diego)

<https://www.healio.com/infectious-disease/mrsa/news/online/%7B91bde5c-d4c7-426d-97f7-b42169472618%7D/daily-chlorhexidine-does-not-reduce-mrsa-vre-in-lower-risk-patients>

The FDA has not approved, and issued a warning, regarding using the wipes as a “general skin cleanser”.

In ADDITION, there is mounting evidence that CHX promotes resistance to itself, other antibiotics and Colistin, the last line of defense antibiotic for CRE.

<https://www.beckershospitalreview.com/quality/study-links-antibiotic-resistance-with-chlorhexidine-exposure.html>

Slide 9: This intervention did not stop an MRSA outbreak at the lead author’s institution. And the lead author reported at ID Week that outside the ICU it was only effective on patients with medical devices. – To be expected because of the long acting effect of chlorhexidine.

Slide 10: The World Health Organizations recommends preoperative screening all patients for *Staph Aureus*, we do not even do this for MRSA.

Must have better staffing. Time to do hand hygiene and the donning and doffing of protective gear. The BUGG Study (Benefits of Universal Glove and Gowns) published in JAMA found no difference in patient adverse events in those patients in isolation. “Although there was a lower risk of MRSA acquisition alone and no difference in adverse events.”

(Universal glove and gown use and acquisition of antibiotic-resistant bacteria in the ICU: a randomized trial. JAMA. 2013 Oct 16;310(15):1571-80.)

The lead author also reemphasized this finding in testimony before the Presidential Advisory Council for Combating Antibiotic Resistant Organisms.

I feel that on a system level, this had led to the adoption of a one size does not fit all approach, and a desire to purchase the cheapest set of shoes. What emerged is a lackadaisical attitude toward the handling of dangerous pathogens by not making the very large investments in staff, training and equipment that are needed to stop this epidemic.

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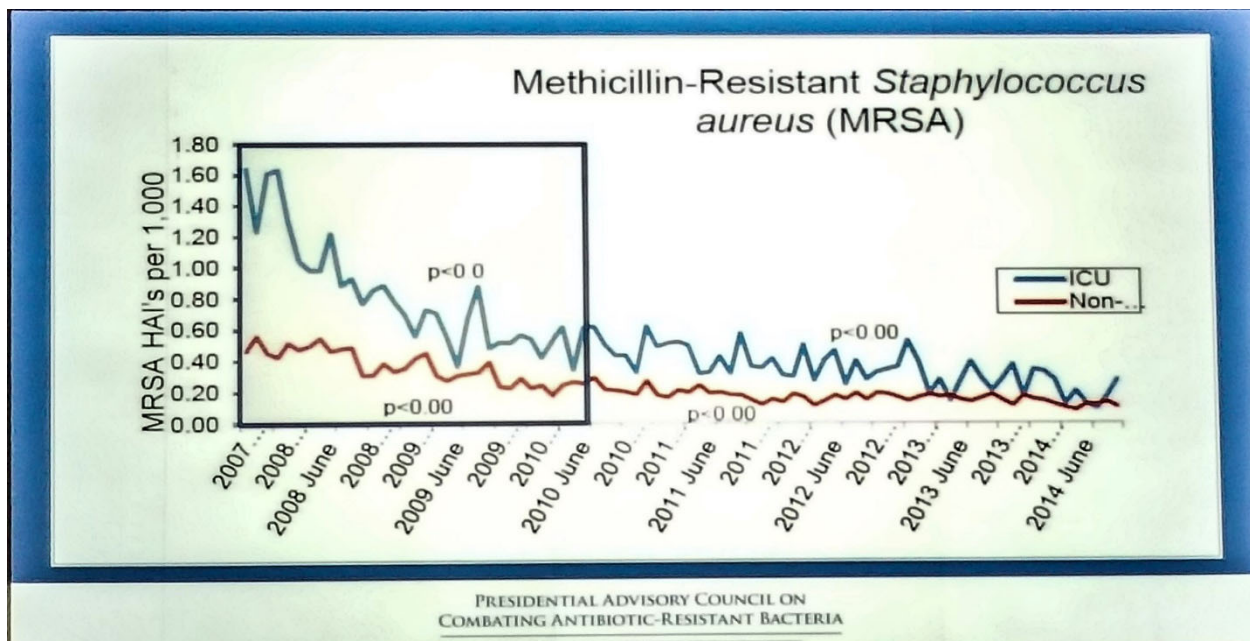
Selected References

Randomized Studies showing Surveillance and Isolation of MRSA to be Effective

- 1) Harris AD, Pineles L, Belton B, et al. Universal glove and gown use and acquisition of antibiotic-resistant bacteria in the ICU: a randomized trial. *JAMA*. 2013 Oct 16;310(15):1571-80.)
- 2) Robicsek A, Beaumont JL, Paule SM, Hacek DM, Thomson RB Jr, Kaul KL, King P, Peterson LR. Universal surveillance for methicillin-resistant. *Staphylococcus aureus* in 3 affiliated hospitals. *Ann Intern Med*. 2008 Mar 18;148(6):409-18.

Before and after studies:

- 1) Jain R, Kralovic SM, Evans ME, et al. Veterans Affairs initiative to prevent methicillin-resistant *Staphylococcus aureus* infections. *N Engl J Med*. 2011 Apr 14;364(15):1419-30. doi: 10.1056/NEJMoa1007474.
- 2) Updated MRSA Infection Results from the Veterans Administration, presented at the Sept 29, 2015 - Presidential Advisory Council on Combating Antibiotic-Resistant Bacteria.



Evans ME, Kralovic SM, Simbartl LA, Jain R, Roselle GA. Eight years of decreased methicillin-resistant *Staphylococcus aureus* health care-associated infections associated with a Veterans Affairs prevention initiative. *Am J Infect Control*. 2017 Jan 1;45(1):13-16. doi: 10.1016/j.ajic.2016.08.010.

3) The English MRSA Miracle. *Micro Blog*. Your window to the world of health care microbiology and epidemiology; by Jon Otter & Saber Yezli March 3, 2015 <https://reflectionsipc.com/2015/03/03/the-english-mrsa-miracle/>

Studies That Found Daily Bathing With Chlorhexidine Was Not Shown To Reduce MRSA

- 1) Noto MJ, Domenico HJ, Byrne DW, Talbot T, Rice TW, Bernard GR, Wheeler AP. Chlorhexidine bathing and health care-associated infections: a randomized clinical trial. *JAMA*. 2015 Jan 27;313(4):369-78. doi: 10.1001/jama.2014.18400.
- 2) Dicks KV, Lofgren E, Lewis SS, Moehring RW, Sexton DJ, Anderson DJ. A Multicenter Pragmatic Interrupted Time Series Analysis of Chlorhexidine Gluconate Bathing in Community Hospital Intensive Care Units. *Infect Control Hosp Epidemiol*. 2016 Jul;37(7):791-7. doi: 10.1017/ice.2016.23. Epub 2016

Feb 10. "CHG bathing did not affect rates of specific or overall infections due to MRSA."

3) Boonyasiri A, Thaisiam P, Permpikul C, Judaeng T, Suiwongsa B, Apiradeewajeset N, Fakthongphan T, Suddee S, Laoagtipparos W, Thamlikitkul V. Effectiveness of Chlorhexidine Wipes for the Prevention of Multidrug-Resistant Bacterial Colonization and Hospital-Acquired Infections in Intensive Care Unit Patients: A Randomized Trial in Thailand. *Infect Control Hosp Epidemiol.* 2016 Mar;37(3):245-53. doi: 10.1017/ice.2015.285.

Studies which found CHX Associated with Resistance.

"Reduced susceptibility to chlorhexidine may contribute to the success of XDR *K. pneumoniae* as a nosocomial pathogen, and may provide a selective advantage to the international epidemic strain *K. pneumoniae* ST258." Naparstek L, Carmeli Y, Chmelnitsky I, Banin E, Navon-Venezia S. Reduced susceptibility to chlorhexidine among extremely-drug-resistant strains of *Klebsiella pneumoniae*. *J Hosp Infect.* 2012 May;81(1):15-9. doi: 10.1016/j.jhin.2012.02.007. Epub 2012 Mar 30.

Wand ME, Bock LJ, Bonney LC, Sutton JM. *Antimicrob Agents Chemother.* 2016 Dec 27;61(1). pii: e01162-16. doi: 10.1128/AAC.01162-16. Print 2017 Jan. Mechanisms of Increased Resistance to Chlorhexidine and Cross-Resistance to Colistin following Exposure of *Klebsiella pneumoniae* Clinical Isolates to Chlorhexidine.

"Researchers tested strains of *K. pneumoniae* typically found in healthcare and exposed them to increasing concentrations of chlorhexidine. While some strains died from the exposure, others survived and some gained resistance to colistin." Study links antibiotic resistance with chlorhexidine exposure. Becker's. *Clinical Leadership & Infection Control.* Nov. 2, 2016.

<https://www.beckershospitalreview.com/quality/study-links-antibiotic-resistance-with-chlorhexidine-exposure.html>

Reuter's Investigative Report

Nelson DJ, McNeill R. Money from infection-control industry muddies research into beating back superbugs Reuters News Service. Apr. 7, 2017. <http://www.reuters.com/investigates/special-report/usa-superbugs-research/>

Other References

1) Kavanagh KT, Abusalem S, Calderon LE. View point: gaps in the current guidelines for the prevention of Methicillin-resistant *Staphylococcus aureus* surgical site infections. *Antimicrob Resist Infect Control.* 2018 Sep 18;7:112. doi: 10.1186/s13756-018-0407-0. eCollection 2018.

<https://aricjournal.biomedcentral.com/articles/10.1186/s13756-018-0407-0>

2) Kavanagh KT, Abusalem S, Calderon LE. The incidence of MRSA infections in the United States. Is a more comprehensive tracking system needed? *Antimicrobial Resistance and Infection Control.* April 7,

2017. Free Access: <https://rdcu.be/KRmU>

<https://aricjournal.biomedcentral.com/articles/10.1186/s13756-017-0193-0>

3) Kavanagh KT, Tower SS, Saman DM. A perspective on the principles of integrity in infectious disease research. *Journal of Patient Safety*. Mar. 24, 2016.

http://journals.lww.com/journalpatientsafety/Fulltext/2016/06000/A_Perspective_on_the_Principles_of_Integrity_in.1.aspx

4) Kavanagh KT, Calderon LE, Rice M. Authors' Response to Letter Regarding "Questionable validity of the catheter-associated urinary tract infection metric used for value-based purchasing" *American Journal of Infection Control*. Jan. 29, 2016. Published Ahead of

Print. <http://dx.doi.org/10.1016/j.ajic.2015.12.002> <http://www.ajicjournal.org/article/S0196-6553%2815%2901229-8/pdf>

5) Kavanagh KT, Calderon LE and Saman DM Viewpoint: a response to "Screening and isolation to control methicillin-resistant *Staphylococcus aureus*: sense, nonsense, and evidence" *Antimicrobial Resistance and Infection Control* 2015, 4:4 (5 February 2015)

<http://www.aricjournal.com/content/4/1/4>

6) Calderon LE, Kavanagh KT, Rice MK. Questionable Validity of the Catheter Associated Urinary Tract Infection Metric Used for Value Based Purchasing. *American Journal of Infection Control*. Published online Jul. 1, 2015.

<http://www.ajicjournal.org/article/S0196-6553%2815%2900613-6/fulltext>

7) Kavanagh KT, Calderon LE, Saman DM, Abusalem SK. The use of surveillance and preventative measures for methicillin-resistant *staphylococcus aureus* infections in surgical patients. *Antimicrobial Resistance and Infection Control* 2014, 3:18 doi:10.1186/2047-2994-3-18 Published: 14 May 2014. View Altmetric Score <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4028005/>

8) Kavanagh KT, Saman DM, Yu Y. Reply to "Planned Analyses of the REDUCE MRSA Trial" Kevin T. Kavanagh, Daniel M. Saman and Yanling Yu *Antimicrob. Agents Chemother.* 2014, 58(4):2486. DOI: 10.1128/AAC.02821-13. <http://aac.asm.org/content/58/4/2486.long>

9) Kavanagh KT, Saman DM, Yu Y. A Perspective on How the United States Fell Behind Northern Europe in the Battle Against Methicillin Resistant *Staphylococcus Aureus*. *Antimicrobial Agents and Chemotherapy*. (Ahead of Print. Oct. 7, 2013.) *Dec. 2013* 57(12):5789-5791. PMID: 24100502

<http://aac.asm.org/content/57/12/5789.full.pdf>

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