



UNIVERSITY *of* MARYLAND
SCHOOL OF MEDICINE

Infection Prevention Best Practices – Lessons Learned and Gaps

Anthony Harris, MD, MPH

Professor

Study questions

- Does universal gowning and gloving prevent MRSA and VRE?
 - Primary outcome: Composite MRSA or VRE acquisition
 - Key secondary outcomes: MRSA and VRE acquisition analyzed individually
- Other secondary outcomes:
 - Adverse events
 - Hand hygiene compliance
 - Number of healthcare worker visits
 - Healthcare-associated infections

Study Arms

Arm I:

Control ICUs

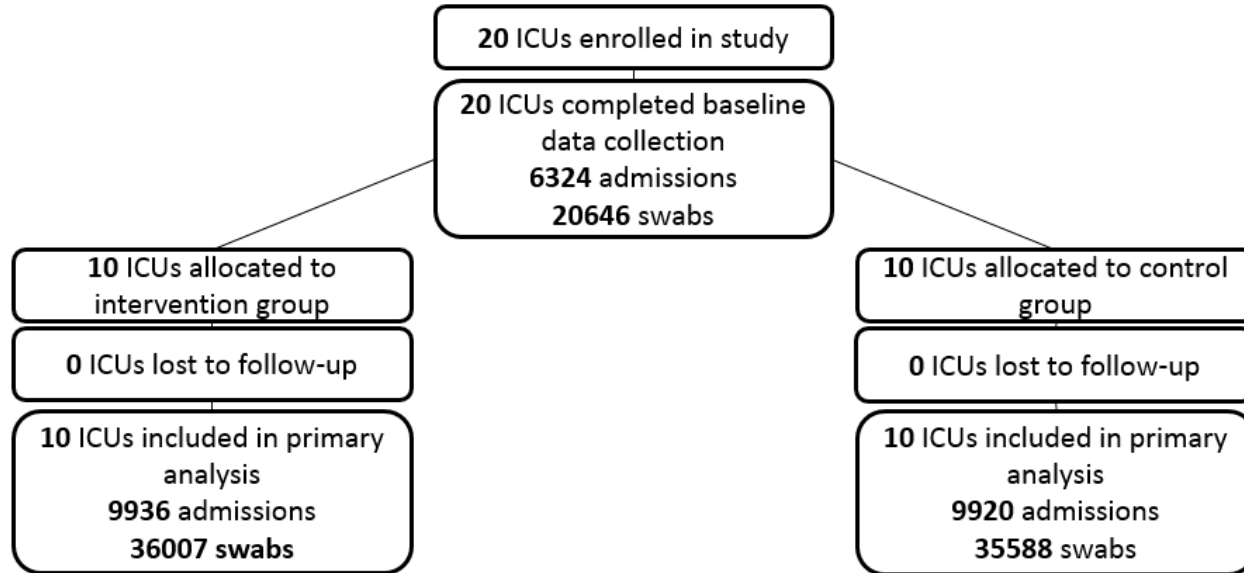
- Continued current standard of care
 - Contact Precautions for patients known to be infected or colonized by antibiotic-resistant bacteria

Arm II:

Intervention ICUs

- Gloves and gowns worn by staff for all contact with patients and when entering any patient room

BUGG study overview



Harris et al., JAMA. 2013 Oct;310:1571. Study funded by the Agency for Healthcare Research and Quality

Results: Decrease in MRSA acquisition

	Intervention ICUs			Control ICUs			P-value ^c	Percent relative change in rate from baseline to study period
	Baseline rate Mean (SE) ^a	Study rate Mean (SE) ^a	% Relative Change ^b (95% CI)	Baseline rate Mean (SE) ^a	Study rate Mean (SE) ^a	% Relative Change ^b (95% CI)		
VRE or MRSA	21.35 (2.12)	16.91 (1.57)	-20.82 (-40.77, 5.85)	19.02 (2.84)	16.29 (1.57)	-14.38 (-33.69, 10.54)	0.57	
VRE	15.18 (2.86)	13.59 (1.94)	-10.53 (-42.20, 38.50)	14.37 (2.43)	11.88 (1.93)	-17.30 (-35.90, 6.69)	0.70	
MRSA	10.03 (1.12)	6.00 (0.79)	-40.18 (-58.16, 14.48)	6.98 (1.56)	5.94 (0.78)	-14.97 (-41.66, 23.94)	0.046	

^a calculated as weighted geometric means

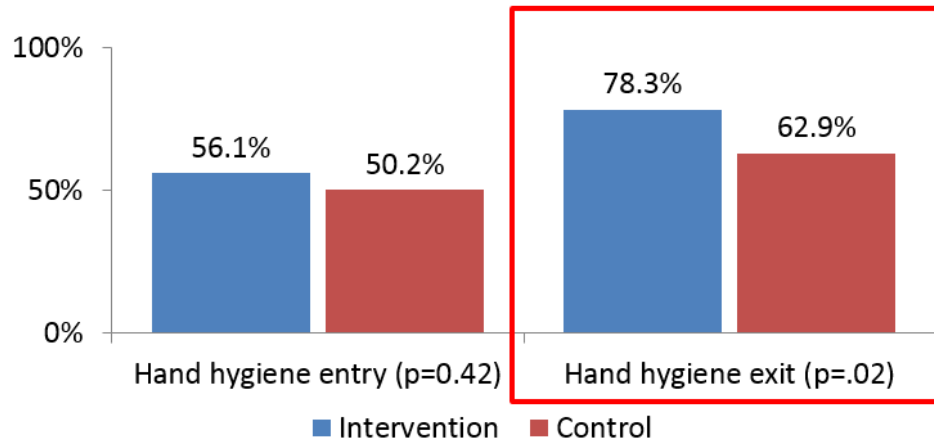
^b calculated as $100 \times (\text{study period}/\text{baseline period} - 1)$, where study period/baseline period is a weighted geometric mean

^c Calculated from a weighted paired t-test, comparing differences in rate changes

[Text Version](#)

Secondary outcome results: Improved hand hygiene

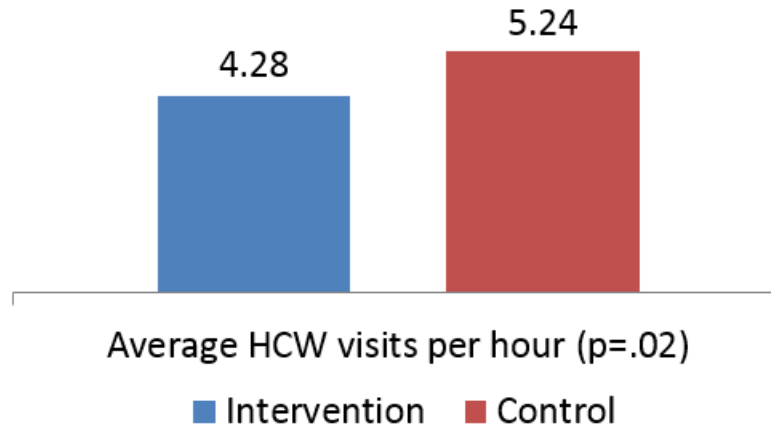
Units	Intervention	Control
Hand hygiene entry (p=0.42)	56.09%	50.20%
Hand hygiene exit (p=.02)	78.29%	62.91%



Secondary outcome results: Fewer HCW visits per hour

Average HCW visits per hour (p=.02)

Intervention	Control
4.28	5.24



Key secondary outcome: Trend towards decreased adverse events

- ICU adverse events lower in the intervention arm but this difference is not statistically significant ($p=.24$)
 - 58.7 events per 1000 patient days universal glove and gown
 - 74.4 events per 1000 patient days control

Key points

- Contact precautions are very important to prevent transmission of antibiotic-resistant bacteria especially in high risk settings
- Contact precautions do not lead to an increase in adverse events
- Future research needed on better contact precautions, more optimal use and implementation
- Important to fund large randomized trials to get definitive answers

Intervention ICUS

	Baseline rate Mean (SE) ^a	Study rate Mean (SE) ^a	% Relative Change ^b (95% CI)
VRE or MSA	21.35 (2.12)	16.91 (1.57)	-20.82 (-40.77, 5.85)
VRE	15.18 (2.86)	13.59 (1.94)	-10.53 (-43.20, 38.50)
MRSA	10.03 (1.12)	6.00 (0.79)	-40.18 (-56.16, -14.48)

Control ICUs

	Baseline rate Mean (SE) ^a	Study rate Mean (SE) ^a	% Relative Change ^b (95% CI)	P-value ^c
VRE or MSA	19.2 (2.84)	16.29 (1.57)	-14.38 (-33.69, 10.54)	0.75
VRE	14.37 (2.43)	11.88 (1.93)	-17.30 (-35.90, 6.69)	0.70
MRSA	6.98 (1.56)	5.94 (0.78)	-14.97 (-41.66, 23.94)	0.046

^a calculated as weighted geometric means

^b calculated as $100 * (\text{study period}/\text{baseline period} - 1)$, where study period/baseline period is a weighted geometric mean

^c calculated from a weighted paired t-test, comparing difference in a rate changes.