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Background. The increasing incidence of carbapenemase-producing Enterobacteriaceae (CPE) is a global health concern, as treatment options are extremely limited. The prevalence of CPE in UK hospitals is unknown, as national screening guidelines only recommend screening in patients considered to be at high-risk of CPE. Patients in intensive care units (ICU) are at high-risk of healthcare-associated infections caused by multidrug-resistant organisms (MDRO).

Methods. We conducted a six-month prospective surveillance study to determine the prevalence of MDRO in a UK teaching hospital ICU. Between June and December 2016, all adult patients admitted to ICU were screened for MDRO on admission, on discharge, and weekly during their ICU stay. Surveillance samples included stool or rectal swabs, urine, sputum or tracheal aspirates, and wound swabs (if wounds were present). Isolates were characterized phenotypically before undergoing whole-genome sequencing (WGS), epidemiological, and phylogenetic analyses.

Results. During the first week of the study we identified stool carriage of a multidrug-resistant *Klebsiella pneumoniae* strain in two patients neither of whom had recognized risk factors for CPE. Both isolates were resistant to all antibiotics tested, apart from colistin, and were PCR-positive for the $bla_{\text{NDM-1}}$ gene. Enhanced surveillance by the infection control team identified four additional patients in several wards who had stool carriage ($n = 3$) or bloodstream infection ($n = 1$) with a $bla_{\text{NDM-1}}$ *K. pneumoniae isolate*. Epidemiological links were identified between these six patients. Five months later, a second outbreak of multidrug-resistant *K. pneumoniae* was detected, involving stool carriage by four patients on two different wards. Environmental screening identified environmental contamination with multidrug-resistant *K. pneumoniae* on one ward. DNA sequence analysis confirmed that a novel $bla_{\text{NDM-1}}$ *K. pneumoniae*lineage (ST78) was responsible for both outbreaks in the hospital.

Conclusion. We identified two unsuspected $bla_{\text{NDM-1}}$ *K. pneumoniae* outbreaks in patients with no recognized risk factors for CPE. This highlights the importance of prospective surveillance for MDRO in high-risk settings, such as ICUs, and supports the use of rapid WGS to support outbreak investigations in real-time.

Disclosures. **All authors:** No reported disclosures.

1698. Comparison of 30- and 90-Day Mortality Rates in Patients with Cultures Positive for Carbapenem-resistant Enterobacteriaceae and Acinetobacter in Atlanta, 2011–2015

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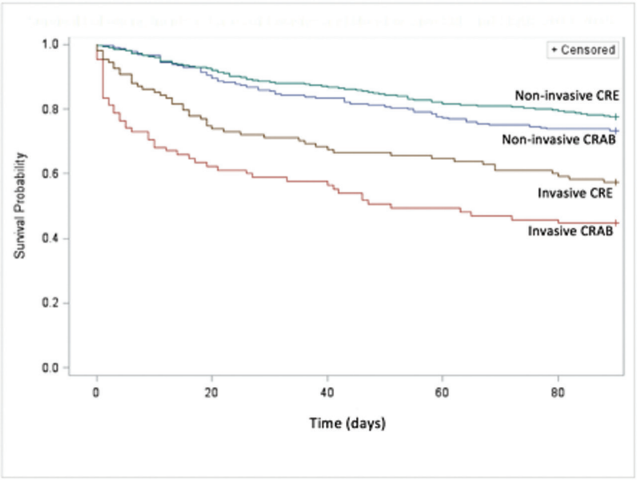
Background. Carbapenem-resistant Enterobacteriaceae (CRE) and *Acinetobacter baumannii* (CRAB) pose a threat to public health, but comparisons of disease burden are limited. We compared survival in patients following cultures positive for CRE or CRAB.

Methods. The Georgia Emerging Infections Program performs active population-based and laboratory-based surveillance for CRE and CRAB in metropolitan Atlanta, GA. Using standard CDC definitions, we included patients who had incident carbapenem-nonsusceptible *E. coli*, *Klebsiella* spp., *Enterobacter* spp., or *Acinetobacter baumannii* isolated from urine only (noninvasive infection) or a sterile site (invasive infection) between 8/2011 and 12/2015. Death dates, verified by Georgia Vital Statistics records, were used to calculate 30- and 90-day mortality rates. We used the chi-square test for mortality rates and the log-rank test for survival analysis to 90 days to compare patients with invasive CRAB, noninvasive CRAB, invasive CRE, and noninvasive CRE.

Results. There were 535 patients with CRE (87 invasive, 448 noninvasive) and 279 (78 invasive, 201 noninvasive) with CRAB. Nearly all patients with CRE and CRAB had healthcare exposures (97.2% vs. 100%) and most were immunosuppressed (62.6% vs. 56.3%). Both 30-day (24.4% vs. 18.3%, p = 0.04) and 90-day (37.6% vs. 30.5%, p = 0.04) mortality were higher in patients with CRAB than CRE. Patients with invasive infections were more likely to die at 90 days than those with noninvasive infections (53.3% vs. 38.4%, p < 0.0001). Overall mortality rates for invasive infection were similar between CRAB and CRE at 30 (44.9% vs. 34.5% p = 0.2) and 90 days (59.0% vs. 48.3%, p = 0.2). Using survival analysis at 90 days, invasive CRAB had the worst outcomes, followed by invasive CRE, noninvasive CRAB and noninvasive CRE (p < 0.0001, see Figure).

Conclusion. ***Ninety***-day mortality for invasive infections with CRE and CRAB was ~50%, and patients with CRAB had lower survival than those with CRE, suggesting that prevention efforts may need to prioritize CRAB as highly as CRE in facilities with endemic CRAB. With the high proportion of healthcare exposures and immunosuppression, these infections may signify poor prognosis or directly contribute to mortality.

Figure. Survival Following Incident Cases of Invasive and Non-Invasive Carbapenem-resistant Enterobacteriaceae (CRE) and *Acinetobacter baumannii* (CRAB), Atlanta, 2011-2015



Disclosures. **All authors:** No reported disclosures.

1699. Prevalence and Acquisition of MRSA During Incarceration at a Large Inner-city Jail

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Background. USA300 MRSA is endemic in certain communities, with congregate settings such as urban jails potentially facilitating spread. The extent of MRSA transmission in jail is unclear, a controversy that impacts prevention strategies. We determined the prevalence of MRSA colonization at jail entrance and defined the acquisition rate during incarceration.

Methods. Men incarcerated at the Cook County Jail, one of the largest US single-site jails, were enrolled within 72 hours of intake. Surveillance cultures (nares, throat, groin) were collected to determine prevalence of MRSA colonization. A survey was administered to identify predictors of colonization. Detainees still in jail at Day30 had cultures repeated to determine MRSA acquisition rate. Univariate and multivariate analysis was performed to identify predictors of MRSA colonization.

Results. **A total o** 402 men (447 unique incarcerations) have so far been enrolled (77% AA, 11% Hispanic) with 92% previously in jail (20% in past 6 months). The prevalence of MRSA colonization at intake was 18.6% (83/447), with 39% of those colonized solely in the throat or groin. At 30 days: 10% (9/92) of initially negative men acquired MRSA; 14 admission positives remained colonized while 11 lost colonization. On univariate (Table), predictors of MRSA colonization at entrance to the jail were: methamphetamine use (METH), unstable housing, current skin infection, and care at an outpatient Clinic A that emphasizes comprehensive care to the LGBTQ community. In this cohort, METH use was associated with reporting being a man who has sex with men vs. not (35% vs. 9%, $P < 0.001$) and was common among men with care at Clinic A (18% vs. 3%, $P < 0.001$). On multivariate with adjustment for race/ethnicity and HIV status, current skin infection and care at clinic A were associated with MRSA. Preliminarily, sharing personal items was associated with MRSA acquisition at Day30 (OR = 5.6, 95% CI,1.3, 23.3, $P = 0.02$).

Conclusion. We found that a relatively high proportion of individuals enter the jail colonized with MRSA and the jail may amplify rates. Entrance colonization risk factors point to possible community reservoirs. Enrollment is ongoing but results suggest an intervention in jail could impact MRSA rates in the jail and in the surrounding community.

Table. Predictors of MRSA Colonization at Entrance to a Large Inner-City Jail

	Univariate			Multivariate		
Epidemiologic Factor						
	OR	**95% CI**	**p value**	**OR**	**95% CI**	**p value**
Race/ethnicity						
African-American	1	0.5, 2.2	0.99			
Hispanic	1.2	0.5, 3.4	0.69			
Non-Hispanic white	reference					
History of illicit drug use	0.9	0.3, 2.2	0.74			
History of methamphetamine use	1.7	0.95, 3.0	0.07			
Men who have sex with men	1.3	0.8, 2.1	0.38			
History of incarceration in jail	1.6	0.5, 4.6	0.4			
Homeless or unstable housing	1.5	0.9, 2.5	0.09			
Current skin infection	3.7	1.5, 9.0	0.004	4	1.6, 9.9	0.002
HIV-infected	1.4	0.7, 2.7	0.35			
Not in HIV care	1.4	0.6, 3.2	0.42			
Care at Clinic A	3.2	1.4, 7.5	0.008	3.8	1.6, 9.1	0.003
Taking antiretrovirals	0.7	0.4, 1.3	0.26			

Note. A total of 70 variables were tested on univariate but are not shown as they were non-significant or had small numbers.

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1700. Differences in Pre- and Post-dischcarge Methicillin-resistant Staphylococcus aureus (MRSA) infection rates by colonization status in US Department of Veterans Affairs (VA) hospitals

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Background. Little is known about how MRSA infection rates differ between patients who are colonized on admission compared with those who acquire colonization during an inpatient stay. In addition, most studies focus on MRSA infections that are diagnosed prior to discharge while ignoring those that are identified post-discharge. The VA implemented an active surveillance program for MRSA in 2007 in which all inpatients are tested for MRSA on admission. This surveillance data along with the ability to follow patients longitudinally allowed us to estimate the difference in infection rates for those who import vs. those who acquire MRSA colonization during their stay and to characterize post-discharge MRSA infections.

Methods. We constructed a dataset of 3,659,911 acute care inpatient admissions to 125 VA hospitals nationwide between January 1, 2008 and December 31/2015 who had surveillance tests performed for MRSA carriage. Admissions were restricted to individuals with at least 365 days of VA activity prior to admission. We categorized these admissions into 3 groups: no colonization, importation, and acquisition based on MRSA test results throughout the admission. We then captured MRSA infections in these individuals prior to discharge and at 30 and 90 days post-discharge. Infections were defined as positive MRSA cultures taken from sterile sites (including blood, catheter site, or bone).

Results. During the 8-year period, we identified 4,037 total pre-discharge MRSA infections, 2,793 MRSA infections at 30 days post-discharge, and 7,018 infections at 90 days post-discharge. During the pre-discharge time period, patients who acquired MRSA carriage were more likely to progress to an infection prior to discharge than those who imported the pathogen (RR = 2.6, $P < 0.001$). For patients who acquired MRSA carriage, the percentage who progressed to infection prior to discharge decreased from 2.0% in 2010 to 1.4% in 2015. The results from our analyses can be found in Figures 1–3.

Conclusion. We found that roughly half of post-discharge infections were in patients who acquired the organism pre-discharge. These may be preventable with optimal infection control. In addition, there were nearly twice as many post-discharge MRSA infections at 90 days than during the pre-discharge period.

Figure 1: Pre-discharge MRSA infections by admission year for inpatients with no MRSA colonization, importation, and acquisition

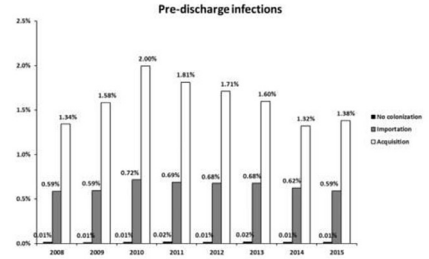


Figure 2: Post-discharge MRSA infections by admission year at 30 days for inpatients with no MRSA colonization, importation, and acquisition

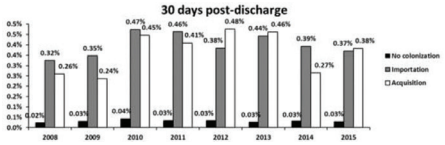
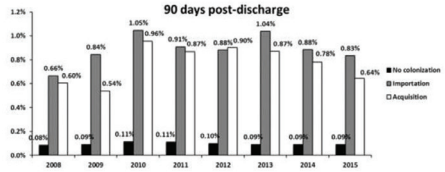


Figure 3: Post-discharge MRSA infections by admission year at 90 days for inpatients with no MRSA colonization, importation, and acquisition



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1701. The Impact of active surveillance culture and decolonization programs on NICU MRSA transmission: A multicenter, mechanistic modeling approach.

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Background. Methicillin-resistant *Staphylococcus aureus* (MRSA) remains a major threat to patient safety in the neonatal intensive care unit (NICU). The aim of this study was to assess the effectiveness of active surveillance cultures (ASC) and decolonization in reducing MRSA transmission in the NICU.

Methods. Retrospective cohort data, including admission and discharge times, weekly surveillance culture results and mupirocin-administration information, were collected from three urban, tertiary care NICU in the US. The study period was 2007–2014, during which ASC and decolonization strategies were employed for MRSA control. We used Markov-Chain Monte Carlo methods to fit a probabilistic transmission model to the data. To account for the interval-censored nature of weekly surveillance screening, we used an integrated Bayesian framework to impute the date of conversion to MRSA-positive. We estimated the risk of MRSA acquisition associated with non-patient sources, undetected MRSA carriers, detected MRSA carriers on contact precautions, and MRSA carriers on contact precautions that also received decolonization treatment.

Results. Of the 12,677 neonates that were screened for MRSA colonization at study sites, 533 (4.2%) had a MRSA-positive surveillance culture. Neonates with undetected MRSA colonization were estimated to be the source of 67% (95% credible interval [CI]: 0.64–0.69) of MRSA acquisition. Compared with undetected MRSA carriers, detection and placement on contact precautions deceased the odds of transmission by 99.8% (odds ratio [OR]: 0.0016, 95% CI: 0.0000026–0.033), 99.6% (OR = 0.0036, 95% CI: 0.0000025–0.13), and 99.8% (OR = 0.0024; 95% CI: 0.00000042–0.043) at sites A, B, C, respectively. A 99.9% reduction in transmissibility was sustained among MRSA carriers who also received decolonization treatment (OR = 0.0014, 95% CI: 0.0000080–0.024).

Conclusion. In this multi-centered NICU cohort, ASC and decolonization programs were highly effective in reducing transmission risk from MRSA carriers. Detection of MRSA carriers and the use of contact precautions, alone, were associated with a near-complete reduction in transmission risk. Improving time-to-detection as well as prioritizing nonpatient reservoirs of MRSA could further reduce MRSA acquisition in the NICU.

Disclosures. **All authors:** No reported disclosures.