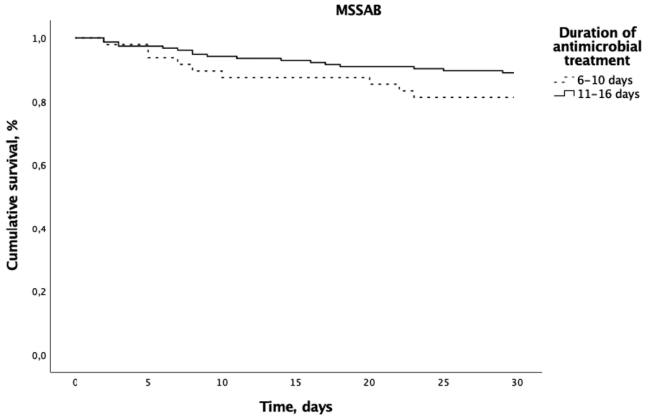

Disclosures. **All authors:** No reported disclosures.

213. A Comparison of Medication Assisted Therapy Treatment Strategies for Opioid Use Disorder in Persons who Inject Drugs and are Hospitalized with Serious Infections

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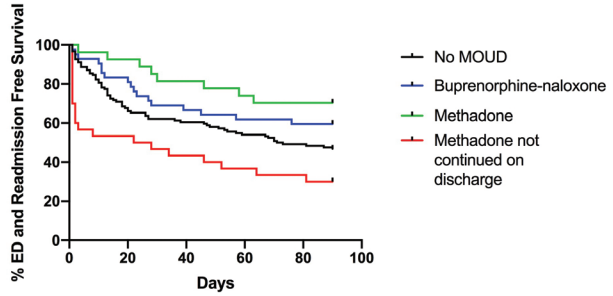
Background. Persons who inject drugs (PWID) with opioid use disorder (OUD) are at increased risk of invasive bacterial and fungal infections, which warrant prolonged, inpatient parenteral antimicrobial therapy. Such admissions are complicated by opioid cravings and withdrawal. Comparisons of medications for OUD during prolonged admissions for these patients have not been previously reported. The aim of this study was to evaluate the impact of different OUD treatment strategies in this population, and their impact on ED and hospital readmissions.

Methods. We retrospectively analyzed consecutive admissions for invasive bacterial or fungal infections in PWID, admitted between January 2016 and January 2019 at Barnes-Jewish Hospital. Patients in our cohort were required to receive an infectious diseases consult, and an anticipated antibiotic treatment duration of >2 weeks. We collected data on demographics, comorbidities, length of stay, microbiologic data, medications prescribed for OUD, mortality, and readmission rates. We compared 90-day readmission rates by OUD treatment strategies using Kaplan–Meier curves.

Results. In our cohort of 237 patients, treatment of OUD was buprenorphine (17.5%), methadone (25.3%), or none (56.2%). Among patients receiving OUD treatment, 30% had methadone tapers and/or methadone discontinued upon discharge. Patient demographics were similar for each OUD treatment strategy. Infection with HIV (2.8%), and hepatitis B (3%), and hepatitis C (67%) were similar between groups. Continuation of medications for OUD was associated with increased completion of parenteral antibiotics (odds ratio 2.11; 95% confidence interval 1.70–2.63). When comparing medications for OUD strategies, methadone had the lowest readmission rates, followed by buprenorphine, and no treatment (P = 0.0013) (figure). Discontinuation of methadone during the admission or upon discharge was associated with the highest readmission rates.

Conclusion. Continuation of OUD treatment without tapering, was associated with improved completion of parenteral antimicrobials in PWID with invasive bacterial or fungal infections lower readmission rates. Tapering OUD treatment during admission was associated with higher readmission rates.

Figure. Inpatient initiation of medications for opioid use disorder (MOUD) and continuation at discharge decrease readmissions in PWID with invasive bacterial and fungal infections.



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

214. Comparison of Clinical and Laboratory Findings of Human Monocytic Ehrlichiosis (HME) and Human Granulocytic Anaplasmosis (HGA) in Long Island, New York.

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Background. Suffolk County reports to the Department of Health the highest absolute number of cases of tick-borne diseases (TBD) for NY State. While Lyme disease and Babesiosis are the most common TBD in this county with more than 600 and 100 cases reported every year, respectively; two other TBD, HME (due to Ehrlichia chaffeensis) and HGA (due to Anaplasma phagocytophilum) are also commonly reported in this county (63 and 37 every year, respectively). There is limited data directly comparing both diseases on acute presentation; the aim of this study was to compare the clinical features, laboratory findings and complications of HME and HGA in the epicenter of TBD in NY State.

Methods. A retrospective study was designed to collect cases with the diagnosis of HME and HGA by using ICD9 or ICD10 codes from 2013 to 2018 at Stony Brook Medicine. Inclusion criteria were patients 18 years or older who had a positive PCR in blood for E. chaffeensis or A. phagocytophilum. Demographics, clinical features, laboratory results, and complications were extracted from patient charts. We used the chi-square test to compare the proportion of symptoms and a two-tailed unpaired student T-test to compare laboratory values.

Results. A total of 40 cases of HME (mean age 67 ± 13) and 27 with HGA (mean age 63 ± 12) met inclusion criteria. Only approximately 50% of cases had a documented history of tick exposure. Clinical presentations were similar in terms of frequency of fever, headache, arthralgia, and myalgia. In contrast, hypotension, confusion, and rash were more common in HME although only the latter was significantly more common. HME patients had significantly greater degrees of leukopenia and thrombocytopenia and elevated AST levels. The majority of patients with HME and HGA were hospitalized >1 day for management of their acute illness (HME, 30/40 and HGA 17/27). Several patients with HME had gastrointestinal (GI) complications including 3 with acute acalculous cholecystitis, 1 with duodenitis, and 1 with acute colitis; 1 patient with HGA had perforated diverticulitis.

Conclusion. Patients with acute HME tend to be more ill than those with acute HGA; however, a substantial proportion of both groups require hospitalization. GI complications were more commonly seen in HME (12.5%) than HGA (3.7%) which deserves further investigation.

	Ehrlichiosis (n=40)	Anaplasmosis (n=27)	P value
Gastrointestinal symptoms	35%	42%	0.5
Confusion	21%	10%	0.2
Systolic BP < 100	17%	5%	0.1
HR> 100	14%	15%	0.9
Fever	75%	70%	0.7
Headache	38%	33%	0.7
Arthralgia	15%	18%	0.7
Rash	30%	7%	0.02
Myalgia	30%	37%	0.6
WBC (mean)	2750/μL	4730/μL	0.001
Hemoglobin (mean)	11.5 g/dL	11.9 g/dL	0.3
Platelets (mean)	68,380/μL	106,650/μL	0.005
Creatinine (mean)	1.54 mg/dL	1.39 mg/dL	0.7
AST (mean)	176 IU/L	93 IU/L	0.025
ALT (mean)	123 IU/L	81 IU/L	0.1

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

215. Invasive Group A Streptococcus-Associated Hospitalizations and Risk Factors for In-Hospital Mortality Among Adults in California, 2000–2016

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Background. Invasive group A *Streptococcus* (iGAS) causes severe illness and death but is not vaccine preventable or nationally notifiable. We describe the

epidemiology of adult patients hospitalized with iGAS in California and risk factors for in-hospital death.

Methods. Using 2000–2016 California hospital discharge data, we extracted records for adults (≥18 years) with ≥1 group A *Streptococcus* (GAS)-associated *International Classification of Diseases, Ninth* or *Tenth Revision* discharge diagnosis code (e.g., unspecified GAS; GAS-specific pharyngitis, pneumonia, and sepsis) or known GAS-associated syndromes (e.g., acute rheumatic fever, erysipelas, scarlet fever). To identify patients hospitalized with iGAS, we selected extracted records that also had codes consistent with invasive disease (e.g., sepsis, pneumonia, intubation, or central line placement). We calculated iGAS-associated hospitalization incidence rates per 100,000 population and described patient demographics and comorbidities. We calculated the odds of in-hospital death using multivariable logistic regression ($P < 0.05$).

Results. During 2000–2016 in California, 37,532 adults were hospitalized with iGAS; 1,045 (3%) died in-hospital. Mean annual hospitalization incidence was 9.4/100,000 population, and was highest (16.3/100,000) in 2016 (Figure 1). Most patients were male (56%), aged 40–65 (45%) or ≥65 (28%) years, and white (60%); 18% were immunocompromised. The percent of patients who died in-hospital increased with age and was highest among those with comorbidities such as malnutrition, cardiovascular disease (CVD), and chronic kidney disease (CKD) (Figure 2). In a multivariable model including age as a continuous variable, sex, and race-ethnicity, the odds of in-hospital death was significantly increased for patients with diagnosis codes for malnutrition, liver disease, CVD, immunosuppression, and CKD (Figure 2); within the race/ethnicity variable Asian/Pacific Islander patients had a higher odds of death compared with white patients.

Conclusion. Hospitalization and subsequent in-hospital death due to iGAS is substantial in California. Adults with iGAS who have specific comorbidities are at greater risk for death when hospitalized with iGAS.

Figure 1: Annual number of patients hospitalized with invasive group A *Streptococcus* and hospitalization rate (per 100,000 population), California, 2000–2016.

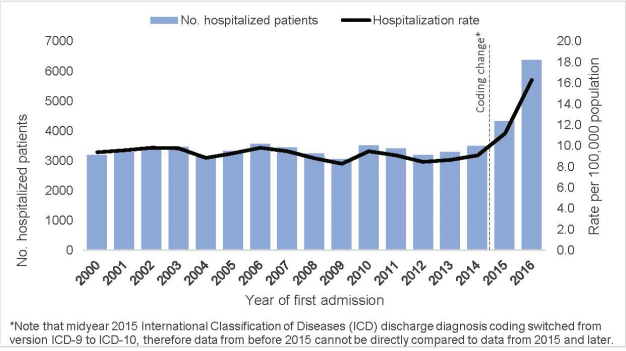
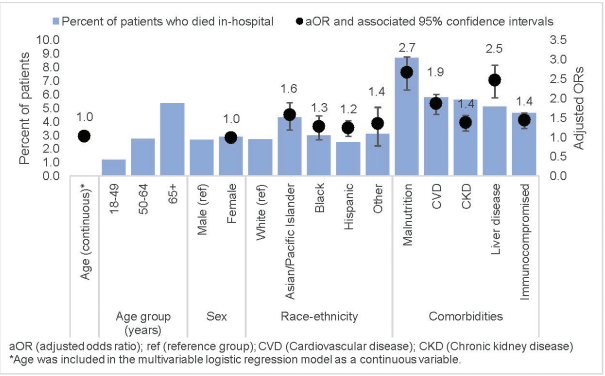


Figure 2: Percent of patients hospitalized with invasive group A *Streptococcus* infection who died in-hospital, and the adjusted odds of in-hospital death calculated using multivariable logistic regression, California, 2000–2016.



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

216. Association Between Days to Initiate Appropriate Therapy and Hospital Length of Stay Among Adult Hospitalized Patients With Gram-negative Bloodstream Infections (GN-BSI)

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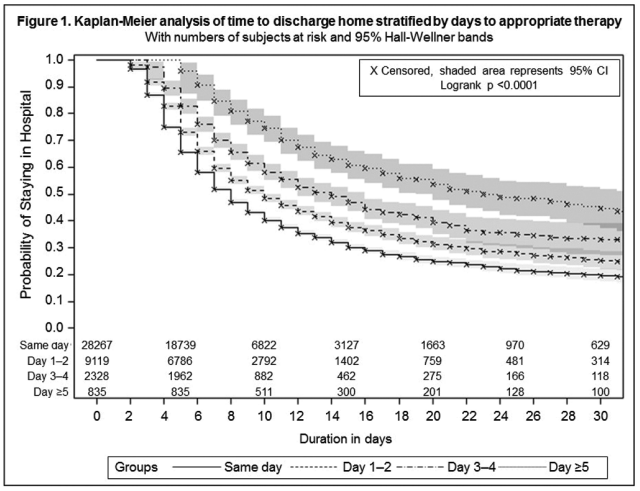
Background. The deleterious outcomes associated with delay receipt of appropriate therapy are well documented. However, scant data exists on the consequences of each day delay of appropriate therapy and subsequent outcomes among adult hospitalized patients with GN-BSIs.

Methods. Study design: a retrospective cohort analysis. Study population: consecutive adult, hospitalized patients with a GN-BSI (11 most prevalent pathogens) in 1 of 181 institutions contributing microbiology data to the Premier Healthcare Database (October 2010–Sep 2015). Exclusion criteria: age < 18 years; diagnosis of pregnancy or cystic fibrosis, died or discharged within 2 days of index GN-BSI culture, lack of sufficient antibiotic susceptibility or treatment data to determine appropriateness. Day of initiating appropriate therapy was defined as the first day when the patient received an antibiotic with *in vitro* activity against the GN-BSI post index culture. Results were summarized by Kaplan–Meier estimates, and Cox Proportional-Hazards (CPH) analyses modeling discharge to home were conducted. Time to initiate appropriate therapy (0, 1–2 days, 3–4 days, ≥5 days) was included in the CPH model as an ordinal variable.

Results. A total of 40,549 patients met selection criteria. Mean (SD) age was 67.5 (16.1) years and 54% were female. *E. coli* and *K. pneumoniae* were the most common GN-BSI (58.0% and 18.3%, respectively). Approximately 30% of patients were in the ICU at index GN-BSI and in-hospital mortality was 6.8%. The mean (SD) time to receive appropriate therapy post index GN-BSI culture was 0.6 (2.7) days, and 69.7%, 22.5%, 5.7% and 2.1% received appropriate therapy in 0, 1–2, 3–4, and ≥5 days of index GN-BSI, respectively. The mean/median LOS post index GN-BSI by 0, 1–2, 3–4, and ≥5 days delays in appropriate treatment were 8.3/6, 9.8/7, 11.5/8, and 19.2/11 days respectively. Kaplan–Meier plots are shown in Figure 1. In the CPH model, each interval delay in appropriate therapy was associated with a 21% decrease in the likelihood of being discharged home for patients with GB-BSIs.

Conclusion. Hospital length of stay was found to increase when appropriate therapy was delayed. These findings highlight the critical need for early appropriate therapy among patients with GN-BSIs.



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

217. Combination Salvage Therapy with Cefazolin Plus Ertapenem for Refractory Methicillin-Susceptible Staphylococcus aureus Bacteremia

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Background. Suboptimal therapy against methicillin-sensitive *Staphylococcus aureus* (MSSA) may have catastrophic consequences in severe infections such as endocarditis or epidural abscess. High MSSA inocula have been associated with clinical failure in patients receiving cefazolin (CZ), particularly when used at low doses, associated with a CZ inoculum effect. We previously described that adding ertapenem (ETP) to CZ led to synergism against MSSA and sensitized the pathogen to host innate immune factors. Here we expand our experience with CZ plus ETP as salvage therapy for 11 cases of refractory MSSA bacteremia (lacking source control problems) and explore CZ+ETP combination *in vitro* and *in vivo.*

Methods. Six available MSSA strains from patients treated with CZ+ETP for refractory bacteremia were tested in Mueller–Hinton Broth or RPMI media at standard (10^5 CFU/mL) or high (10^7 CFU/mL) inocula by MIC, checkerboard, and time-kill assays using ETP, CZ or nafcillin (NAF) alone vs. ETP+NAF or ETP+CZ. Disk diffusion synergy assays between CZ and ETP were also performed. CZ, ETP and CZ+ETP were tested in a rat endocarditis model using well described MSSA, TX0117 and TX0117c.