if withdrawal of care or death occurred within 48 hours of blood culture results or if the infection was associated with a ventricular assist device. Medical records were reviewed for the duration of bacteremia, complications, treatment decisions and clinical outcomes. This study was approved by the Institutional Review Board.

Results. One hundred forty-two discrete episodes of SAB were identified with a median age of 54 years (IQR 40–63). Most cases were community-acquired (83.8%) and 33.8% were MRSA. Active injection drug use was present in 22.5% (33.3% MRSA, 17% MSSA). The median duration of bacteremia was 2.6 days (IQR 1.8–4.6) and 3.9 days (IQR 2.2–7.5) for MSSA and MRSA, respectively. The median time to first source control procedure was twice as long with bacteremia over 5 days than with a shorter duration of bacteremia (2.6 vs. 1.3 days). Complication rates increased with bacteremia duration and bacteremia longer than 5 days was associated with significantly higher rates of endocarditis (46.2%, $P < 0.001$), epidural abscesses (35.9%, $P = 0.001$), intracranial infections (12.8%, $P = 0.02$), and presence of at least one endovascular nidus (76.9%, $P < 0.001$) compared with bacteremia less than 5 days (28.4%), but 30 day mortality rates were similar (7.7% and 9.8%, respectively).

Conclusion. Complication rates increase significantly with SAB greater than 5 days duration. Early source control and investigation to identify metastatic and especially endovascular foci of infection are paramount in patients with prolonged bacteremia even if complications are not discovered on initial evaluation.

Table 1. Patient demographics and disease characteristics

	Total (n=142)	MRSA (n=48)	MSSA (n=94)
Age, median (IQR)	54 (40-63)	48 (39-56)	57 (43-65)
Female (%)	29.6	29.2	29.8
Community acquired (%)	83.8	85.4	83.0
Active IDU (%)	22.5	33.3	17.0
Homelessness (%)	14.1	12.5	14.9
Comorbidities (%)			
➢ **HIV**	0	0	0
➢ **Cirrhosis**	11.3	6.3	13.8
➢ **Malignancy**	11.3	10.4	11.7
➢ **Systemic chemotherapy**	7.7	6.3	8.5
➢ **Systemic steroids**	5.6	2.1	7.4
➢ **BMT/SOT**	4.9	8.3	3.2
CVC associated (%)	17.6	12.5	20.2
Inpatient mortality (%)	6.3	10.4	4.3
30 day mortality (%)	9.2	12.5	7.4
90 day mortality (%)	14.1	18.8	11.7
Infectious diseases consult (%)	91.5	100	87.2
Duration of bacteremia[a]			
➢ **< 3 days**	74	18	56
➢ **≥ 3 days**	67	30	37
➢ **≥ 5 days**	39	17	22
Source control procedure (%)	58.5	64.6	55.3

Abbreviations: IDU, injection drug use; BMT, bone marrow transplant; SOT, solid organ transplant; CVC, central venous catheter

[a]excluding one patient whose bacteremia duration could not be determined due to lack of repeat blood cultures

Table 2. Complications and outcomes by duration of bacteremia

	Bacteremia < 5 days (N=102)	Bacteremia ≥ 5 days (N=39)	*P* value
	No. (%)	No. (%)	
Endocarditis	12 (11.8)	18 (46.2)	<0.001
Endovascular graft or device[a]	9 (8.8)	6 (15.4)	0.36
DVT/SVT present	8 (7.8)	6 (15.4)	0.21
Endovascular nidus[b]	29 (28.4)	30 (76.9)	<0.001
Intracranial infection	2 (2.0)	5 (12.8)	0.02
Epidural abscess or spinal OM/discitis[c]	8 (7.8)	14 (35.9)	0.001
Septic arthritis	9 (8.8)	7 (17.9)	0.14
Extra-axial osteomyelitis	12 (11.8)	7 (17.9)	0.41
Pleural empyema	2 (2.0)	2 (5.1)	0.31
Other deep abscess	2 (2.0)	5 (12.8)	0.02
30 day mortality	10 (9.8)	3 (7.7)	1.0
90 day mortality	15 (14.7)	5 (12.8)	1.0
Days to first source control procedure, median (IQR)	1.3 (0.3-3.0)	2.6 (0.4-7.0)	

Abbreviations: DVT, deep vein thrombosis; SVT, superficial vein thrombosis; OM, osteomyelitis

[a]ventricular assist devices (VADs) were excluded

[b]endovascular nidus: endocarditis and/or endovascular graft or device and/or DVT/SVT present

[c]8 of 14 patients with bacteremia ≥ 5 days had both epidural abscess/OM and an endovascular nidus. No patients with bacteremia < 5 days had both epidural abscess/OM and an endovascular nidus.

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

210. Step-down from IV to oral therapy in patients with bacteremia due to Enterobacteriaceae: fluoroquinolones (FQ) vs. ß-lactams (BL) or trimethoprim-sulfamethoxazole (TMP-SMX)

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Background. Patients with Gram-negative bloodstream infection (GN BSI) commonly transition from intravenous (IV) to oral therapy after clinical improvement. Some clinical reports suggest similar outcomes with oral step down to TMP/SMX or BL compared with FQ in uncomplicated GN BSI, despite questionable pharmacodynamic target achievement with oral administration of the former. We sought to compare clinical outcomes in Stanford Health Care (SHC) patients with GN BSI who received step-down therapy with FQ vs. BL or TMP/SMX.

Methods. This was a retrospective cohort study of patients treated at SHC from 1/2010–December 2018 for Enterobacteriaceae bacteremia with oral stepdown to FQ vs. non-FQ (TMP-SMX, BL) initiated by day 7 of therapy. Preliminary data were obtained from electronic health records (EHR) and analyzed via the GreenButton informatics consult service at SHC. The primary outcome was 30-day mortality. Secondary outcomes included 30 and 90-day recurrent BSI, and 90-day *C.difficile* infection (CDI). Survival analysis was completed for each outcome using the log-rank test to calculate hazard ratio (HR). Cohorts were compared without adjustment and with basic matching controlling for age, sex, length of EHR record, and number of encounters with SHC.

Results. Of 529 eligible patients, 414 were in the FQ vs. 115 in the non-FQ oral stepdown cohorts. In unadjusted analysis, 30-day mortality was similar between the FQ and non-FQ groups, (5.8% vs. 6.1%, HR 1.06; 95% CI, 0.46–2.46), $P = 0.89$. Thirty-day recurrent BSI (1.2% vs. 2.6%, HR 2.20; 95% CI, 0.53–9.20) $P = 0.27$) and 90-day CDI rates (3.1% vs. 1.7%, HR 0.56; 95% CI 0.13–2.48, $P = 0.44$) were similar between groups. Ninety-day recurrent BSI was higher in the non-FQ group (1.9% vs. 5.2%, HR 1.38; 95% CI, 0.31–6.15. $P = 0.0485$).(Table 1) In matched analysis ($n = 61$), 30-day mortality was similar between groups (5.8% vs. 6.1%; HR 1.06, 95% CI 0.46–2.46, $P = 0.89$). Matched analysis found no statistically significant differences between groups for all secondary outcomes. (Table 2)

Conclusion. In this study, 30-day mortality was not different among patients that received oral step down to an FQ vs. non-FQ for the treatment of Enterobacteriaceae bacteremia. Larger, prospective trials are warranted to validate observations and determine optimal dosing of oral antibiotics in this setting.

Table 1. Primary and Secondary outcomes (unadjusted analysis)

Cohort	FQ (n=414)	Non- FQ (n=115)	Chi-Squared	p-value	HR (95% CI)
Primary Outcome					
30-day mortality	24 (5.8%)	7 (6.1%)	0	0.89	1.06 (0.46-2.46)
Secondary Outcomes					
30-day recurrent bloodstream infection	5 (1.2%)	3 (2.6%)	1.2	0.30	2.20 (0.53-9.20)
90-day recurrent bloodstream infection	8 (1.9%)	6 (5.2%)	3.9	0.0485	2.78 (0.96- 8.00)
90-day *C.difficile* infection	13 (3.1%)	2 (1.7%)	0.6	0.44	0.56 (0.13-2.48)

Table 2. Primary and Secondary outcomes (matched)

Cohort	FQ (n=61)	Non- FQ (n=61)	Chi-Squared	p-value	HR (95% CI)
Primary Outcome					
30-day mortality	2 (3.3%)	5 (8.2%)	1.3	0.25	2.55 (0.49-13.14)
Secondary Outcomes					
30-day recurrent bloodstream infection	2 (3.3%)	3 (4.9%)	0.2	0.64	1.52 (0.26-9.22)
90-day recurrent bloodstream infection	3 (4.9%)	4 (6.6%)	0.2	0.68	1.38 (0.31- 6.15)
90-day *C.difficile* infection	2 (3.3%)	1 (1.6%)	0.3	0.57	0.51 (0.05- 5.61)

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

211. Coxiella burnetii: 7 Years of Experience at a Tertiary-Care Center

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Background. Q fever is a zoonotic disease caused by *Coxiella burnetii*. Primary infection can progress to persistent infection irrespective of initial symptomatology. Our aim is to describe the clinical features, treatment, risk of progression, use of prophylaxis, and outcomes of *Coxiella burnetii* infection at our institution.

Methods. We did a retrospective review of all adult patients with positive *Coxiella burnetii* serology at Mayo Clinic, Rochester from 1st January 2012 to 31st December 2018. Centers for Disease Control and Prevention (CDC) case definition and classification were used to group the patients into confirmed and probable acute Q fever, and confirmed and probable chronic/persistent Q fever. Data on demographics, clinical presentation, comorbid conditions, exposure history, risk factors associated with progression, serology, treatment and outcomes were collected.

Results. We found 266 patients with positive titres of *Coxiella* IgG or IgM greater than 1:16, of which 49 patients met the CDC case definition for Q fever. Median age at presentation was 62 years. 45/49 (91. 8%) were men, while 4/49 (8%) were women. 20/49 (40. 8%) patients presented with acute Q fever of which 5 (25%) patients progressed to persistent infection. 29/49 (59%) patients presented with persistent Q fever of which 4 patients could recall symptoms suggestive of acute Q fever. The most common presentation of acute Q fever was acute febrile illness (65%). Endocarditis (11/29) was the most common presentation of chronic/persistent Q fever. Of the 5 patients with acute Q fever that progressed to persistent infection, 3/5(60%) progressed despite being on doxycycline and hydroxychloroquine. 8/29 patients with persistent Q fever had serological resolution at last follow-up. 2/4(50%) deaths were attributable to Q fever.

Conclusion. Minority of the patients tested met the case definition. 25% of patients with acute disease progressed to chronic Q fever out of which 60%(3/5) progressed despite prophylaxis. Endocarditis and vascular infections were the most common chronic cases. Interestingly we found 4 cases of MPGN in association with Q fever. Prosthetic valves are the most important risk factors for progression ($P = 0.02$). Serological cure often lags behind clinical cure (27% vs. 68% in persistent infection)(Table 4).

Variable	Acute Q fever (n=20)	Persistent Q fever (n=29)	P value
Age (median)	60	62	0.4391
Gender(men)	18(90%)	27(93%)	1.00
Median duration of symptoms (weeks)	4 (3 to 8)	40(18-52)	0.0001
Immunosuppression	3 (15%)	6 (21%)	0.7199
Steroids	2 (10%)	5 (17%)	0.6848
Targeted therapy	1(5%)	1(3.45%)	1.00
Diabetes mellitus	4(20%)	5(17.4%)	1.00
Chronic Kidney Disease	4(20%)	9(31%)	0.51
Active malignancy	4(20%)	3(10.34%)	0.42
Transplant	1(5%)	2(6.9%)	1.00
Risk factors for progression	7 (35%)	20 (70%)	0.0234
Prosthetic valves	1 (5%)	10 (34%)	0.0175
Vascular graft	2(10%)	7(24%)	0.277
Vascular aneurysm	2(10%)	7(24.14%)	0.277
MPGN	1(5%)	3(10%)	0.63

Table 1: Differences in baseline characteristics, comorbidities and underlying risk factors between acute and persistent Q fever patients.

Clinical presentation	Acute Q fever
• Fever	13/20(65%)
• Chills	14/20(70%)
• Night sweats	12/20(60%0
• Pneumonia	1/20(5%)
• Hepatitis	2/20(10%)
• Meningoencephalitis	1/20(5%)
• MPGN	1/20(5%)
• Lymphadenitis	1/20(5%)
Clinical presentation	**Chronic/persistent Q fever**
• Endocarditis	11/29(38%)
• Vascular graft infection	5/29(17%)
• Vascular aneurysm infection	4/29(13.7%)
• Osteomyelitis	3/29(10%)
• Possible lymphoma associated with Q fever	1/29(3.4%)
• Prosthetic knee joint infection	1/29(3.4%)
• MPGN	3/29(10%)
• Granulomatous hepatitis	2/29(6.8%)
• Recurrence of prosthetic valve endocarditis in transplanted heart.	1/29(3.4%)
Exposure to *Coxiella burnetii*	
• Contact with farm animals	27/49 (55%)
• Abbatoir workers	1/49 (2%)
• Laboratory personnel/agricultural researchers	1/49(2%)
• Living close to farms/contaminated dust	11/49 (22%)
• Unpasteurized dairy products	1/49(2%)
• No known exposure	17/49 (34%)

Table 2: Common clinical presentations and exposures in acute and persistent Q fever infections. Some of the patients had overlapping symptoms.

Variable	Acute Q fever only(n=15)	Acute Q fever progressing to persistent Q fever(n=5)	p-value
Age(median)	61(54-66)	59(40-62)	0.27
Immunosuppression	3(20%)	0	0.53
Chronic Kidney Disease	4(26.67%)	0	0.53
Active malignancy	4(26.67%)	0	0.53
Phase II IgG at presentation(median)	1:2048(1:256 to 1:16000)	1:4096(1:2048 to 1:10240)	0.2107
Phase I IgG at presentation (median)	1:16(1:16 to 1:256)	1:64(1:16 to 1:10240)	0.19
TTE at baseline	5(33%)	3(60%)	0.34
TEE at baseline	7(46%)	3(60%)	1.00
Risk factors for progression	5(33%)	2(40%)	1.00
Prosthetic valves	0	1(20%)	0.25
Vascular graft	0	2(40%)	0.05
Vascular aneurysm	1(6%)	1(20%)	0.44
Duration of treatment(days)	18(14 to 28.5)	16(14 to 503)	0.40
Prophylaxis with dual therapy	3(20%)	3(60%)	0.13

Table 3: Differences in baseline characteristics, comorbidities, underlying risk factors between patients with acute Q fever alone versus those who progress to persistent phase of infection.

Outcome	Acute Q fever	Persistent Q fever
Serological resolution	-	8/29(27.5%)
Clinical resolution	19/20 (95%)	20/29(69%)
Recurrence	0	3/29(10.3%)
Lost to follow up	1/20(5%)	7/29(24%)
Progression to persistent Q fever infection.	5/20(25%)	-
Death	0	2/29(7%)

Table 4: Outcome data. Serological resolution is defined as 4 fold decrease in phase I IgG titres or a decrease in phase I IgG to <1:400 and is used for patients with persistent Q fever. There are no clear guidelines on serological resolution in acute Q fever.

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

212. Outcomes of Adults with Uncomplicated Staphylococcus aureus Bacteremia Receiving Short-Course Vs. Prolonged-Course Antibiotic Therapy in a Multicenter, Propensity Score–Matched Cohort

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Background. The recommended duration of antibiotic treatment for uncomplicated *Staphylococcus aureus* bloodstream infections is 14 days. We compared the outcomes of patients receiving short-course (6–10 days) vs. prolonged-course (11–16 days) antibiotic therapy for *S. aureus* bacteremia (SAB).

Methods. 30-day outcome of patients with penicillin (PSSAB, $n = 202$)) or methicillin-susceptible SAB (MSSAB, $n = 203$) treated with in vitro active therapy in the range of 6–16 days was analyzed using pooled data from two previously published, observational studies. Individuals were matched 1:1 by nearest neighbor propensity score matching without replacement. Regression analysis was performed to estimate the risk of all-cause mortality within 30 days after the end of antibiotic treatment. Eligible individuals had to have >1 day of follow-up after discontinuation of antimicrobials. Individuals with a diagnosis of endocarditis, bone infection, meningitis or pneumonia were excluded.

Results. There were 107 well-balanced matched pairs; 58 in the PSSAB and 39 in the MSSAB cohort. For PSSAB, the median duration of therapy was 8 (interquartile range [IQR], 7–10) in the short-course group and 12 days (IQR, 10–13) in the prolonged-course group. For the MSSAB cohort, these numbers were 9 days (IQR, 7–10) and 14 days (IQR, 13–16 days), respectively. No difference in mortality between short-course and prolonged-course treatment was observed (adjusted hazard ratio [aHR], 0.74; 95% confidence interval [CI], .23–2.41) and 1.14; 95% CI, 0.31–4.20), respectively for PSSAB and MSSAB.

Conclusion. Short courses of antibiotic therapy yielded similar clinical outcomes as prolonged courses of antibiotic therapy for *S. aureus* bacteremia. The findings warrant a randomized clinical trial to study the safety and efficacy of shortened antimicrobial therapy for the treatment of uncomplicated SAB.

	Penicillin-susceptible *Staphylococcus aureus* bacteremia cohort				Methicillin-susceptible *Staphylococcus aureus* bacteremia cohort			
	Whole cohort		Propensity-matched cohort		Whole cohort		Propensity-matched cohort	
	HR (95% CI)	P value	HR (95% CI)	P value	HR (95% CI)	P value	HR (95% CI)	P value
Crude	1.14 (0.48-2.70)	0.77	0.71 (0.23-2.23)	0.56	0.56 (0.25-1.25)	0.16	0.83 (0.25-2.73)	0.76
Multivariate	1.04 (0.43-2.56)[1]	0.92	0.74 (0.23-2.41)[1]	0.62	0.71 (0.31-1.67)[1]	0.43	1.14 (0.31-4.20)[1]	0.84
Propensity score adjusted	1.03 (0.38-2.79)[1]	0.96	-	-	0.80 (0.32-2.01)[1]	0.63	-	-