The cohort consisted of 70 infants with NEC with 11 (16%) having +BSI and 59 (84%) having –BSI. Of the 27 +BSI patients, 18 (66%) were positive only in the aerobic bottle, 7 (26%) were positive only in the anaerobic bottle, and 2 (7%) were positive in both bottles. Of the 59 –BSI patients, 30 (51%) were positive only in the aerobic bottle, 27 (45%) were positive only in the anaerobic bottle, and 2 (3%) were positive in both bottles. Overall, there was a trend toward higher mortality in +BSI patients (8/11, 72.7%) compared to –BSI patients (13/59, 22.0%) (P = 0.02, log-rank test). Significant risk factors for mortality were +BSI status, concurrent NEC, and presence of enteral feeds prior to onset of NEC. The median survival time was 3 days for +BSI patients, compared to 18 days for –BSI patients (P < 0.001, log-rank test). There was a trend toward higher mortality in +BSI patients (8/11, 72.7%) compared to –BSI patients (13/59, 22.0%) (P = 0.02, log-rank test). Significant risk factors for mortality were +BSI status, concurrent NEC, and presence of enteral feeds prior to onset of NEC. The median survival time was 3 days for +BSI patients, compared to 18 days for –BSI patients (P < 0.001, log-rank test).

2326. Necessity of Anaerobic Blood Cultures for Identification of Pediatric Bloodstream Infections

Chen; 25 (42.4); 6 (54.6); 5 (54.6); 0.064; BSI− (P = 0.064)

Methods. We conducted a retrospective cohort study utilizing demographic and microbiology data from the Premier Healthcare Database, including all inpatient encounters from 2009–2016 among patients <19 years. BSI were identified via a documented positive blood culture; known contaminants were excluded. Incidence rate was the number of BSI positive patient encounters per 10,000 admissions. Demographics were analyzed comparing BSI-positive to patients without a documented positive BSI (non-BSI). Hospital-acquired infections were defined as those occurring at least 2 days after admission and analyzed only for non-neonates. Differences were assessed using chi-square tests and t-tests; time trends were analyzed using Cochran-Armitage tests.

Results. Among 162 US hospitals reporting 24 years of blood cultures, 1,809,722 patient encounters met inclusion criteria; 6,152 (0.34%) had a positive BSI. BSI patients were significantly more often 1–5 years old (16% vs. 6%), and had a complex chronic condition (26% vs. 5%), central line (34% vs. 2%), or catheter (12% vs. 3%) compared with non-BSI patients. Overall BSI incidence rate declined over time (37.0 in 2009 vs. 31.9 in 2016 per 10,000 admissions, P < 0.001). Among non-neonates, pathogens with the highest incidence rates (per 10,000 admissions) were methicillin-susceptible Staphylococcus aureus (MSSA) (10.5%), E. coli (10.4%), and Streptococcus pneumoniae (6.4%); among neonates, pathogens with the highest incidence were highest for E. coli (4.3%), Group B Streptococcus (4.0%) and MSSA (2.6%). Incidence increased significantly over time in two US regions while decreasing in three (Figure 2).

Conclusion. Hospitalized children remain at risk of community and hospital-acquired BSI. Due to substantial efforts, pediatric BSI incidence has declined nationally in recent years. However, more effective methods to prevent and assess patients at risk for BSI are warranted.

2327. Microbiology and Prognostic Significance of Blood Stream Infections in Necrotizing Enterocolitis

Thomas Boyle, BS1; Rebecca Starkert, BS2; Ashira Morgan, BS1; Misha Tori Armstrong, BS Biology1; Anna Moscowitz, BS1; Laurence Lindenmayer, BS1; Megan McSherry, BS1; Lukas Gaffney, BS1; Julia Amundson, BS1; Samantha Greissman, BA, MPH1; Chad Thorson, MD2; Eduardo Perez, MD1; Anthony Hogan, MD1; Ann-Christina Brady, MD2; Juan Sola, MD2 and Holly Neville, MD1, University of Miami, Miami, Florida, 1University of Miami Miller School of Medicine, Miami, Florida, 2University of Miami Miller School of Medicine, Miami, Florida, 3University of Miami Miller School of Medicine, Miami, Florida, 4University of Miami Miller School of Medicine, Miami, Florida

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Background. There is conflicting evidence in the literature on the necessity of anaerobic blood cultures for the diagnosis of pediatric bloodstream infections. We here investigated the utility of anaerobic blood culture bottles in addition to aerobic blood culture bottles for the recovery of microorganisms in pediatric blood specimens.

Methods. A retrospective review of positive blood culture records was performed for culture results reported from January 2016 to December 2017. Blood cultures from pediatric patients (<18 years of age) performed at the University of Wisconsin Hospital and Clinics were included in the analysis. Variables collected included demographic, volume of blood cultures, microorganism identification, and time-to-positivity (TTP).

Results. Of 4280 pediatric blood cultures collected during the study period, a total of 266 were positive (6.2%). Of these, 224 had been inoculated into both aerobic and anaerobic bottles, while 42 had only been inoculated into aerobic bottles. For the cases where both aerobic and anaerobic bottles were both inoculated, 100 (44.6% of 224) were positive in both bottles, 76 (33.9%) were positive only in the aerobic bottle, and 48 (21.4%) were positive only in the anaerobic bottle. The mean TTP for aerobic and anaerobic bottles was 22.6 and 21.5 hours, respectively. In the 100 cases where both bottles were positive, the same organism was identified in all but 4 cases. Among the 48 cases with only positive anaerobic bottles, the most commonly isolated genera were Staphylococcus (N = 24, 50%), S. aureus (N = 5, 10%), and Enterococcus and Escherichia (each n = 3, 6%).

Conclusion. Our findings demonstrate that anaerobic blood cultures are necessary to gain a complete understanding of infection status in pediatric patients. This supports the current consensus for adult blood cultures, stating that both aerobic and anaerobic bottles should be inoculated. While it is often more difficult to obtain sufficient blood volumes from pediatric patients, performance of anaerobic culture should be encouraged when possible.

Disclosures. All authors: No reported disclosures.

Table 1: Demographics

| Gender (M) | BS I + (n = 11) | BS I− (n = 59) | P Value |
|-----------|----------------|----------------|---------|
|            | 2 (27.3)       | 29 (49.2)      | 0.173   |
| African American | 6 (54.6)        | 31 (52.5)      | 0.064   |
| Hispanic   | 2 (18.2)       | 25 (42.4)      | 0.064   |
| Non-Hispanic White | 3 (27.3)       | 2 (17.0)       | 0.011   |
| Gestational age (weeks) | 28 (0.12)52     | 27 (0.65).56   | 0.771   |
| Bell Stage 3 | 9 (81.8)        | 39 (66.1)      | 0.280   |
| Surgery   | 5 (45.5)       | 10 (17.0)      | 0.011   |

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Table 2: Survival Analysis

| Factor          | Risk Ratio | 95% CI   | P-Value |
|-----------------|------------|----------|---------|
| BSI             | 5.3        | 0.5–58.6 | 0.145   |
| Male            | 1.0        | 1.0–5.3  | 0.976   |
| African American| 4.7        | 1.1–33.0 | 0.014   |
| No enteral feeds| 15.0       | 1.5–25.3 | 0.002   |
| Surgery         | 2.8–150.4  | 0.002   |
| Recurrence      | 2.9        | 0.2–11.4 | 0.172   |

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2328. Community-Onset Invasive Bacterial Infections in Infants Under 3 Months—10 Years of Experience in Auckland, New Zealand
Sarah Primhak, MBBS BSc(hons)1; Lesley M. Voss, MB, CHB1; Elizabeth Wilson, MBChB2; Diana R. Lennon, MB, CHB2; Rachel Webb, MBChB1 and Emma Best, BHB, MBChB, DTMH, FRACP (PAEDS), MMED (RESEARCH)1,2; Pediatric Infectious Diseases, Starship Children’s Hospital, Auckland, New Zealand, 3Population Child and Youth Health, University of Auckland, Auckland, Auckland, New Zealand, 3Paediatric Infectious Diseases, University of Auckland, Auckland, New Zealand

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Background. Serious infections remain the leading cause of death in the first year of life. Sepsis in neonatal intensive care units is well described but infants with bacterial infections presenting from the community has not previously been described in New Zealand. Recent studies suggest an increasing incidence of Staphylococcus aureus and Streptococcus pyogenes in New Zealand pediatric populations. It is, therefore, important to understand the unique pattern of infections seen in the infant population in New Zealand as this may impact on empiric management.

Methods. A retrospective study (2007–2017) including infants aged 8 to 90 days presenting with clinically significant infection and positive culture from a sterile site. Cases were identified from laboratory database and ICD discharge codes, enabling data collection and analysis.

Results. 192 cases were identified from two major hospitals in Auckland. This represented an incidence of invasive bacterial infections of 129/100,000 live births. Escherichia coli (40%) and Streptococcus agalactiae (22%) were the commonest pathogens. Streptococcus pyogenes and Staphylococcus aureus caused 14% and 12% of bacteraemias respectively. Pacific island infants had the highest rates of infection (255/100,000) as did those from deprived backgrounds.

Conclusion. Escherichia coli and Streptococcus agalactiae are the commonest causative organisms in community-onset infant sepsis in Auckland. Rates of invasive bacterial infections in this age group are higher than reported in other industrialized countries (including published data from the USA), with Staphylococcus aureus and Streptococcus pyogenes being the most disproportionately. Our study demonstrates the increased risk of invasive Staphylococcus aureus and Streptococcus pyogenes in New Zealand, even at this early age, and this impacts on empiric antibiotic prescribing and management of infant sepsis in New Zealand. The risk of invasive infection is highest in Pacific and Māori infants and those from deprived backgrounds.

A small number of multi-resistant organisms were present in this age group, prior to antibiotic exposure, illustrating that rising rates of community antimicrobial resistance will need to be considered even when prescribing for infants.

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2329. Preliminary Safety and Effectiveness of Whole-Body MRI in Pediatric Patients With Persistent Bacteremia or Febrile Illness
Edwin Hayes, MD1; Lindsay Miranda, BS2; Anna-Kathryn Burch, MD3; Matthew Marcus, MD3; Helmut Albrecht, MD3 and Kamla Sanasi-Bhola, MD3
1Infectious Diseases, University of South Carolina, Columbia, South Carolina, 2Pediatrics ID, University of South Carolina, Columbia, South Carolina, 3Pediatrics, Department of Medicine, Division of Infectious Diseases, University of South Carolina School of Medicine, Columbia, South Carolina, 4University of South Carolina School of Medicine, Columbia, South Carolina

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Background. Early recognition of deep seated infections (osteomyelitis and abscesses) in the pediatric population may be difficult, given nonspecific symptoms and signs but remains crucial in the management. There is increasing emphasis on ionizing radiation dose reduction, making whole-body MRI (WBMRI) with short T1 inversion recovery (STIR) the advanced imaging modality of choice over bone scintigraphy and CT-scan.

Methods. A retrospective chart review of pediatric patients, <19 years, at Palmetto Health, Columbia, SC who had WBMRI with infectious indications during 9/2011 to 12/2013 was performed. The aims of this research were to describe complications related to sedation/contrast, to determine what proportion of patients had new evidence of deep seated infections and to obtain initial evidence for effectiveness of WBMRI.

Results. 20 patients were included with male predominance (12; 60%). 9/20 patients <12 months old and 4 between the ages of 12–70 months. The most common comorbidity was sickle cell disease (n = 6) and 16/20 patients had a recent/current central venous catheter. The reasons for imaging were fever (9, 45%), pain/swelling (5, 25%), and abnormal labs/imaging (6, 30%). 19 patients had other diagnostics studies prior to WBMRI, 17 of whom had ionizing radiation using studies (X-rays / CT scans). 10/19 also had additional trips to the radiology department for local MRIs. Duration of sedation for WBMRI averaged 88 minutes, with propofol (10/14) being the most common agent used. No complications from the sedation or the MRI contrast were recorded. WBMRI found an average of 1–4 areas of osteomyelitis in 11 patients and up to 8 other locations of deep seated infections in 15 patients. 11/20 had WBMRI surgical intervention of debridement/drainage. Gram-positive cocci were isolated from 10/17 patients with positive blood/tissue cultures. Of those, 6 were methicillin-resistant Staphylococcus aureus.

Conclusion. Utilized as an early imaging modality in pediatric patients with persistent bacteremia/fevers, WBMRI commonly facilitated timely definitive interventions while sparing the patient exposure to ionizing radiation. WBMRI with STIR was safe and is likely to be cost effective.

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2330. Comparison of Clinical Symptoms in Children Who Present With Sore Throat Who Are Later Determined to Be Carriers vs. Acutely Infected
Anne-Marie Rick, MD, MPH1; Haniah Zaheer, BS2 and Judith M. Martin, MD3; Department of Pediatrics, Children’s Hospital of Pittsburgh, Pittsburgh, Pennsylvania, 1University of Pittsburgh, Pittsburgh, Pennsylvania

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Background. Among symptomatic children who test positive for Group A Streptococcus (GAS) by throat swab, approximately 20–25% are GAS carriers. Current laboratory methods cannot distinguish acute infection from the carrier state at time of diagnosis.

Methods. We examined findings from two longitudinal studies of children 5 to 15 years of age who had throat cultures performed for the detection of GAS while endorsing at least one symptom consistent with streptococcal pharyngitis. Cohort 1 was a surveillance study in which cultures were performed at regular intervals and with illnesses. Cohort 2 were children who were selectively tested by their care providers and then followed. Symptoms were assessed systematically at the time of the first positive culture. Each participant had at least two follow-up cultures performed between 7–21 days and 22–35 days after the first culture. We defined acute infection as two or more negative follow-up cultures for GAS and carriage as two or more positive follow-up cultures in the absence of symptoms. We compared symptoms at the time of the first positive culture between those with acute infection or carriage using chi-square statistics.

Results. A total of 181 children contributed 228 symptomatic episodes; 52% were female, with a mean age of 8.9 years. In cohort 1: 96/122 (79%) were acute infections vs. 26/121 (21%) were carriers. Children endorsed at least one upper respiratory symptom (other than sore throat) in 40/65 (62%) of those with acute infection and 13/21 (62%) in those who were carriers (P = 0.976). In cohort 2: 94/106 (89%) were acutely infected and 12/106 (11%) were carriers. Children had at least one upper respiratory symptom in 24/94 (26%) acute infection and 6/12 (50%) of carriers (P = 0.076). In cohort 2, symptoms of nasal congestion alone (P = 0.009), vomiting (P = 0.018), and abdominal pain (P = 0.015) were more frequent among carriers compared with acutely infected. There was no difference in severity score or duration of symptoms.

Conclusion. This study highlights that when children are selectively tested for GAS based on clinical judgement fewer GAS carriers are identified. For those who were selectively tested, clinical symptoms, including nasal congestion, were more common in children identified as GAS carriers.

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2331. Household Pets and Recovery of Moraxella catarrhalis and Other Respiratory Pathogens From Children With Asthma
Natalia Balcer, PhD, DVM MPVM1; Kathryn Dalton, VMD, MPH2; Zoe Johnson, BS3, Shanna Laidwig, PhD3; Katie Sabelia, DVM4; Michelle Newman, RN5; Susan Balcer Whaley, MPH1; Corinne Keet, MD, PhD6; Meredith C. McCormack, MD, MBBS7; Karen C. Carroll, MD, FIDSA8 and Elizabeth C. Matsui, MD, MHS9
1Department of Environmental Health and Engineering, Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland, 2Schools of Public Health, Johns Hopkins University School of Public Health, Baltimore, Baltimore, Maryland, 3Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland, 4Department of Pediatrics, Johns Hopkins School of Medicine, Baltimore, Maryland, 5Department of Medicine, Johns Hopkins School of Medicine, Baltimore, Maryland, 6Department of Pathology, Division of Medical Microbiology, Johns Hopkins University School of Medicine, Baltimore, Maryland, 7Department of Medicine, Johns Hopkins School of Medicine, Baltimore, Maryland, 8Department of Pediatrics, Johns Hopkins School of Medicine, Baltimore, Maryland, 9Department of Pathology, Division of Medical Microbiology, Johns Hopkins University School of Medicine, Baltimore, Maryland

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Background. Upper respiratory tract colonization with a number of bacterial pathogens has been associated with significant respiratory disease and asthma in children. As part of a larger study to evaluate microbial contributions from animals...