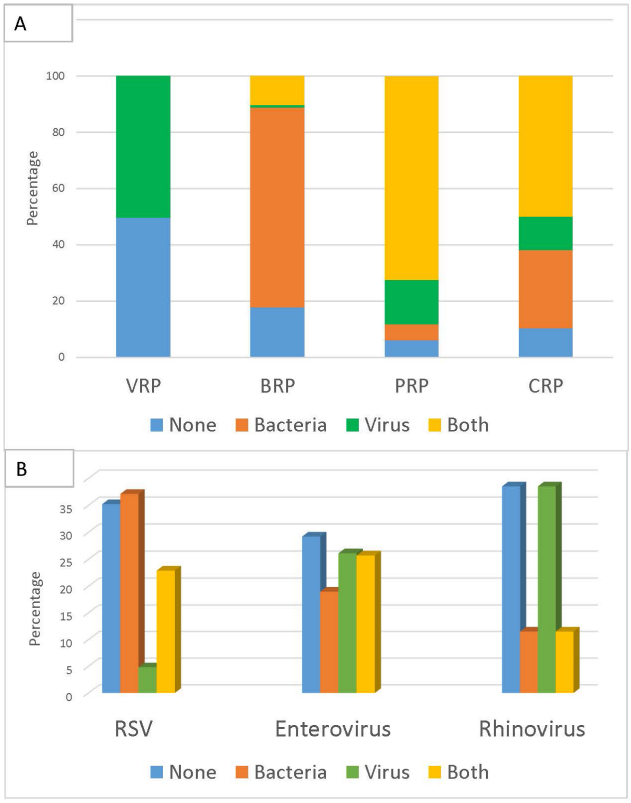

Figure 2. Proportion of Co-detection. A. By test. B. By most frequent viruses detected. VRP (Viral Respiratory Panel), BRP (Basic Respiratory Panel), PRP (Pediatric Respiratory Panel) CRP (Complete Respiratory Panel).

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2623. Bacterial Co-detection and Outcomes for Infants with Bronchiolitis Requiring Emergency Department Intubation for Respiratory Failure

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Background: Viral bronchiolitis is a common cause of respiratory failure requiring intubation and ICU admission for infants. Bacterial codetection from respiratory cultures is common but its association with outcomes is unclear.

Methods: We conducted a retrospective cohort study over 5 years of infants <1 year with suspected bronchiolitis who were intubated in our ED with subsequent ICU admission. We evaluated the association between bacterial codetection (bacteria + many PMNs) and outcomes (mechanical ventilation (MV) duration, ICU LOS). Analysis was performed using gamma regression. Results are reported as risk ratios (RR) or adjusted risk ratios (aRR).

Results: 149 patients were analyzed (median age 1.3 months, 59% male, 54% prematurity). 91% had confirmed viral infection (56% RSV, 35% non-RSV, 13% polyviral); 52% had codetection. Median MV duration was 5.1 days; median ICU LOS was 6.8 days. Prematurity, PRISM3 score, RSV, black race, and positive non-respiratory culture were associated with longer MV duration. Prematurity, RSV positivity and positive non-respiratory culture were associated with longer ICU LOS. Bacterial codetection (RR 0.82; 0.68–1.0) was associated with shorter MV duration and shorter ICU LOS (RR 0.80; 0.67–0.94); this remained true after adjusting for confounders (aRR for shorter MV duration: 0.82; 0.69–0.98; aRR for shorter ICU LOS: 0.81; 0.69–0.94). 95% of patients with positive cultures (109/115) had appropriate ED antibiotics; median time to correct antibiotics was 1.4 hours. Further investigation showed that bacterial codetection was associated with decreased MV duration in those with time to correct antibiotics of ≤1.4 hours (aRR 0.70; 0.54–0.89) but not in those whose time to antibiotics was >1.4 hours (aRR 0.98; 0.78–1.24).

Conclusion: In infants intubated in the ED for bronchiolitis, bacterial codetection was associated with shorter ICU LOS overall and with shorter MV duration among patients with rapid time to correct antibiotics; however, there was no significant association between bacterial codetection and MV duration among patients with longer time to correct antibiotics. Further research is needed to elucidate the true impact of bacterial codetection as well as empiric antibiotic administration on outcomes in infants intubated for bronchiolitis.

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

2624. Viral Pneumonia in Children: Facing the Challenge Using the Host Response

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Background: Diagnosing viral pneumonia in children is challenging. Chest radiographic imaging and clinical findings cannot reliably distinguish viral from bacterial pneumonia. Furthermore, pathogen-based diagnosis is limited by inaccessible site of infection and high asymptomatic detection rates. The objectives of this analysis were twofold: first, to establish pneumonia etiology by applying a rigorous expert panel process, and second, to evaluate whether a novel host-immune signature that integrates viral induced proteins TRAIL and IP-10 together with bacterial CRP, can accurately differentiate viral from bacterial pneumonia.

Methods: This analysis included 1025 febrile children enrolled in two multi-center clinical studies that evaluated the host-immune signature performance: 'Curiosity' study (Oved et al., PLoS One 2015) and 'Pathfinder' study (Srugo et al., Pediatrics 2017). Pneumonia etiology – viral or bacterial – was determined by a panel of 3 independent experts, after reviewing patients' clinical, laboratory, microbiological, and radiological data. Only cases with majority panel assignment were included. The host-signature generated one of the three ***results:*** viral, equivocal or bacterial, based on predetermined cut-offs.

Results: A total of 709 children were eligible for analysis and had an expert panel etiology determination. Of them, 114 were diagnosed with pneumonia: 51 assigned viral and 63 assigned bacterial (Figure 1). The signature separated viral from bacterial pneumonia with a sensitivity of 94% (95% CI: 85%–99%) and specificity of 95% (85%–99%) with 14% equivocal test results. Out of the 51 children diagnosed with viral pneumonia by the expert panel, 40 (78%) were given antibiotics, and 43 (83%) underwent chest x-ray evaluation. The signature correctly classified 42 of these 51 viral children, indicating its potential to reduce antibiotic overuse rates by 4.4-fold (from 78% to 18%; $P < 0.001$) and chest x-ray examination by 4.8-fold (from 83% to 18%; $P < 0.001$).

Conclusion: The TRAIL/IP-10/CRP signature exhibits high accuracy for diagnosing viral pneumonia in children. The signature's potential to safely decrease unnecessary antibiotics and chest radiographic imaging should be examined in future utility studies.

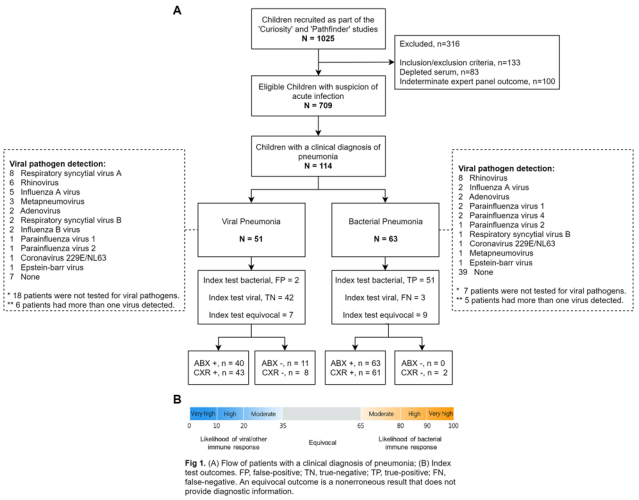

Fig 1. (A) Flow of patients with a clinical diagnosis of pneumonia; (B) Index test outcomes. FP, false-positive; TN, true-negative; TP, true-positive; FN, false-negative. An equivocal outcome is a nonerroneous result that does not provide diagnostic information.

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2625. Incidence of Bronchiolitis Requiring Hospitalization in the First 2 years of Life Among Healthy Term Infants with Different Races/Ethnicities: A Population-based Longitudinal Study

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Background: Race/ethnicity is currently not considered a risk factor for bronchiolitis, except for indigenous populations in western countries. We sought to determine the incidence of hospitalization with bronchiolitis among different races/ethnicities, because such information can lead to more tailored preventive care.