Pediatric community-acquired pneumonia (CAP) is a leading cause of hospitalization. Antibiotics are critical for the treatment of CAP and result in approximately 1 million antibiotic prescriptions annually in United States. Antibiotics select for antibiotic resistance and are associated with adverse effects, which include dysbiosis in the microbiome. SCOUT-CAP is a multi-center, randomized, double-blind, placebo-controlled, superiority clinical trial that compares a 5-day beta-lactam (short) strategy to a 10-day (standard) beta-lactam strategy for the treatment of pediatric CAP. During this seminar we will discuss 1) advances in clinical trial design that can be leveraged to effectively address antibiotic resistance and 2) how the duration of antibiotic therapy impacts the respiratory resistome and microbiota in children.