Background

- Gastroenteritis accounts for >450,000 US hospitalizations annually; etiology is found in <50%
- Multiplex PCR could provide rapid, simultaneous ID of multiple pathogens not suspected clinically or not detectable by standard tests (ST)
- Enhanced ID could impact IP practices
- There are few studies of stool PCR testing in children with diarrhea

Objective

- Compare BioFire FilmArray® GI Panel with standard tests (ST) for pathogen ID
- Compare diagnostic yield of physician selected ST versus nonselective GI Panel
- Assess the impact of rapid, enhanced ID on IP practices

Methods

- Convenience sample of liquid stool specimens submitted to clinical lab for ST from Mar '14-Mar '15 were studied
- ST performed per physician orders (ST could include stool culture, parasite microscopy, and enzyme immunoassays (EIA) for rotavirus, adenovirus, C. difficile (w/reflexive NAAT), Shiga-like toxin-producing E. coli (STEC), Cryptosporidium, Giardia)
- GI PCR Panel performed as validation study, with one specimen test per patient per encounter; results were not available in real time. GI panel tests for 22 pathogens (13 bacteria, 5 viruses, 4 protozoa)
- Medical charts reviewed retrospectively to assess clinical data and isolation measures

Results

- Of 40 hospitalized patients with CO-diarrhea, only 85% were placed in enteric isolation
- Of 8 hospitalized patients with hospital-associated diarrhea, C. difficile was identified in 3 patients (both PCR and ST positive); only one out of these 3 patients with C. difficile diarrhea was placed in high-level enteric isolation

PCR identified pathogens in 62% of specimens vs 30% for ST (p <0.005). PCR identified 23 additional pathogens among 17 ST-negative specimens (Fig 1)

ST missed 15 pathogens that should have led to high-level enteric isolation per hospital policy (Fig 2). 15 missed pathogens in Fig 2 equated to 11 patients (average length of stay 4.5 days) who were not placed in high-level enteric isolation

Conclusions

- PCR enhanced pathogen ID >2 fold
- Use of PCR could optimize isolation practices
- Low yield of ST is due both to insensitivity and to inadequate physician selection of tests