

**Methods.** Single center prospective study that enrolled hospitalized children and adolescents  $\leq 21$  years old with COVID-19 from March 2020-April 2021 at Nationwide Children's Hospital, Columbus, OH. Nasopharyngeal (NP) and blood samples were obtained and SARS-CoV-2 RNA was quantified using a real time PCR assay targeting the N1 gene. Pertinent demographic, clinical, laboratory, and outcome data were evaluated.

**Results.** We enrolled a convenience sample of 103 hospitalized children (median age, 9 years; range, 3 days-21 years) who had confirmed SARS-CoV-2 infection and both NP and blood samples obtained (Table 1). Overall, 27 (26%) patients with COVID-19 had SARS-CoV-2 RNAemia. Compared with patients who had undetectable RNAemia, those with SARS-CoV-2 RNAemia had significantly higher nasopharyngeal RNA loads (8.1 vs. 4.9 log<sub>10</sub> copies/mL;  $p=0.0006$ ), fever (78 vs 54%;  $p=0.02$ ), receipt of supplemental oxygen (37% vs 14%;  $p=0.02$ ), and treatment with anti-COVID-19 medications (30% vs 12%;  $p=0.04$ ). In addition, patients with SARS-CoV-2 RNAemia were more likely to require intensive care (40% vs. 20%,  $p=0.04$ ) and had longer hospitalization (2.56 vs 2.15 days;  $p=0.03$ ). There were no COVID-19 related deaths.

Table 1. Demographic, clinical, laboratory and virology characteristics of study patients

Characteristic	RNAemia, n=27	No RNAemia, n=76	P value
Age, years	1.55 (0.10-13.66)	11.05 (1.44-16.13)	0.157
Number of infants	12 (44%)	20 (25%)	0.092
Female sex	11 (41%)	34 (44%)	0.824
Ethnicity			
Hispanic or Latino	4 (18%)	13 (16%)	0.756
Not Hispanic or Latino	18 (82%)	68 (84%)	...
Race			
White	12 (44%)	39 (51%)	0.722
Black	11 (40%)	18 (23%)	...
Multiracial	3 (11%)	10 (13%)	...
Asian	1 (4%)	6 (8%)	...
American Indian or Alaskan Native	0	1 (1%)	...
Unknown	0	1 (1%)	...
Presence of Underlying disease	15 (55%)	34 (48%)	0.371
Admission Unit			
Ward	16 (59%)	61 (80%)	0.040
PICU	11 (41%)	15 (20%)	...
Length of stay, days	2.56 (2.00-14.04)	2.15 (1.35-4.74)	0.032
Days of symptoms	2 (1-3)	4 (1-7)	0.007
Presence of fever	21 (78%)	41 (54%)	0.020
Duration of fever	3 (2-8)	3 (2-6)	0.920
Required O <sub>2</sub> at admission	10 (37%)	11 (14%)	0.024
Administered anti-COVID-19 medication during hospitalization	8 (30%)	9 (12%)	0.039
Administered anticoagulant during hospitalization	6 (22%)	11 (14%)	0.370
Administered systemic steroids during hospitalization	10 (37%)	23 (30%)	0.484
Administered antimicrobials during hospitalization	18 (67%)	35 (45%)	0.074
Abs. Lymphocyte Count (units)	1309 (609-4551)	2103 (1168-3195)	0.271
Viral load, log <sub>10</sub> copies/mL	8.1 (4.8-9.0)	4.9 (3.5-7.3)	0.001

Categorical data are expressed as frequencies (%) and analyzed using Fisher or  $\chi^2$  test. Continuous data are expressed as median (interquartile range) and analyzed using Mann-Whitney rank test. Values in bold indicate significant 2-sided P values.

**Conclusion.** The frequency of SARS-CoV-2 RNAemia in pediatric patients was 26% and its finding was associated with worse clinical in-hospital outcomes, similar to that reported in adults. Testing for SARS-CoV-2 RNAemia in children may help identify those who could benefit from more intensive supportive care as well as antiviral and anti-inflammatory medications.

**Disclosures.** Octavio Ramilo, MD, Adagio (Consultant)Bill & Melinda Gates Foundation (Grant/Research Support)Janssen (Grant/Research Support)Lilly (Consultant)Merck (Consultant, Grant/Research Support)NIH (Grant/Research Support)Pfizer (Consultant)SANOFI (Board Member) Asuncion Mejias, MD, PhD, MsCS, Janssen (Grant/Research Support, Advisor or Review Panel member)Merck (Grant/Research Support, Advisor or Review Panel member)Roche (Advisor or Review Panel member)Sanofi (Advisor or Review Panel member)

## 82. Blood Gene Expression Profiles in Neonates with Herpes Simplex Virus (HSV) Infection

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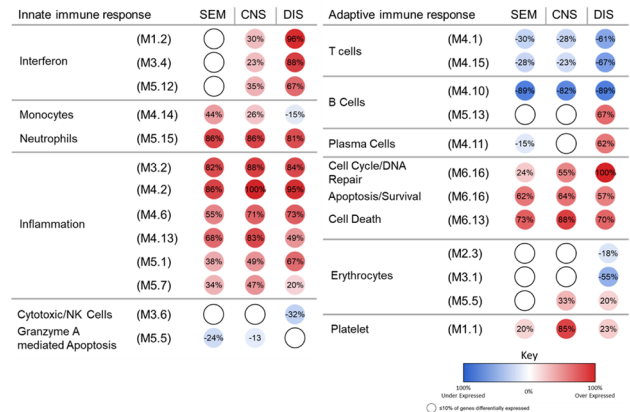
**Session:** O-17. Hot Topics in Pediatric Viral and Fungal Infections

**Background.** Neonatal HSV infection is associated with significant morbidity and mortality. Neonates with HSV infection can present with skin, eye, and mouth (SEM), central nervous system disease (CNS), and disseminated disease (DIS). We hypothesize that host immune responses may contribute to differences in disease presentation and outcomes. To address this knowledge gap, we analyzed host transcriptional immune profiles of neonates with HSV infection.

**Methods.** Infants < 6 weeks of age (24 (86%) < 4 weeks; 4 (14%) 4-6 weeks old) with neonatal HSV, and healthy infant controls (HC) were enrolled at Children's Medical Center (Dallas, TX), and Nationwide Children's Hospital (Columbus, OH) from 2007-2018. Whole blood samples were analyzed by RNA-seq. Modular analyses were performed to identify the immune pathways that were activated or suppressed according to each HSV disease category.

**Results.** Of the 28 infants with HSV infection, 9 had SEM (median [IQR] age: 14 [14-28] days), 10 CNS (age: 18 [15-29] days), and 9 DIS (age: 10 [7-10] days). Three infants with DIS died within 5 days of diagnosis. Statistical group comparisons between 13 HC and 18 infants with HSV disease (training set) identified 1,322 differentially expressed genes (neonatal HSV biosignature). This biosignature was validated in the remaining 10 infants with HSV disease (test set), and was characterized by significant overexpression of interferon (INF), inflammation, neutrophils, and monocyte genes and under-expression of T-cell genes. Further analysis according to HSV disease category confirmed overexpression of neutrophil and inflammation genes in infants with SEM, CNS and DIS (Fig 1). On the other hand, overexpression of INF and plasma cell genes, and further suppression of monocytes, cytotoxic/NK cells, and T-cell genes were only evident in children with DIS.

Fig 1: Modular immune pathways according to HSV disease category



Modules are groups of genes that shared a similar function. Each dot represents a transcriptional module with red indicating overexpression and blue underexpression in relation to healthy controls. The number and color intensity on the dot indicate the percentage of differentially expressed transcripts within a module. SEM: skin, eye mouth; CNS: central nervous system; DIS: disseminated HSV disease.

**Conclusion.** Transcriptional profiles of infants with HSV infection exhibited marked activation of the innate immune response irrespective of disease classification. Children with DIS showed more profound dysregulation and suppression of cellular immune responses. Transcriptional profiling may aid unravel mechanisms associated with clinical outcomes in neonatal HSV and inform future therapeutic and preventive strategies.

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## 83. ID Coaches Contribute to a Highly Effective Learning Experience for Third-Year Medical Students Rotating on the Infectious Diseases Consult Service

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**Session:** O-18. Improving Medical Education in Infectious Diseases

**Background.** Education on infections in hospitalized patients, antimicrobial selection, and principles of antimicrobial stewardship are foundational to all clinicians. Incorporating early learners into Infectious Diseases (ID) consult services has the potential to build a strong fund of knowledge in these content domains, but also poses potential challenges. We evaluated the impact of a novel clinical rotation and supporting curriculum on third-year medical students rotating on the ID consult service for 2 weeks during their 12-week Internal Medicine clerkship at the University of California, San Diego.

**Methods.** Third-year medical students who selected to rotate on the ID consult service were given an hour-long orientation about the service and common infectious syndromes. They were provided with a checklist of clinical skills to complete during the rotation. In addition to daily rounds and clinical care, ID Coaches (ID faculty and senior ID fellows) met with students weekly for 1-2 hours to review ID topics, practice oral presentations, and/or conduct physical exam finding rounds. We surveyed medical students to assess the effectiveness of the rotation.

**Results.** Forty third-year medical students participated in the 2-week ID consult rotation between June 2020-May 2021; 31 (77%) completed the rotation evaluation. Seventy percent or more of students reported that the ID rotation facilitated their learning across 8 of 10 ID-content domains (Figure 1). More students reported that the ID Coach facilitated learning (71%) compared to the clinical skills checklist (42%). Students highlighted learning about antimicrobial selection, stewardship, and clinical reasoning on the rotation but reported that teaching was limited when the service census was high (Figure 2).

Figure 1: Percent of Students Rating the ID Consult Rotation as Extremely or Very Effective in Facilitating Learning Across 10 Domains

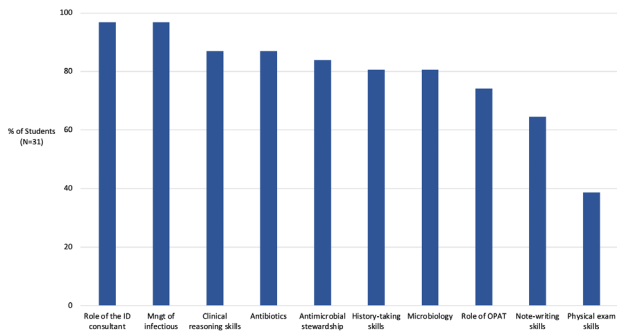


Figure 2: Students' Reflections on the Effectiveness of the ID Consult Rotation

"I personally loved this rotation because **antibiotic usage and stewardship are so essential** to every branch of Medicine, everyone should rotate through this area! I felt like I solidified my knowledge of what antibiotics provide best coverage of what organisms."

"It was really cool to see **thoughtful medical decision making** in action."

"**Really appreciated the [ID coach],** I thought it was a nice touch to have someone to ask my potentially not as intelligent questions to and feel comfortable knowing that they weren't necessarily grading me."

"Unfortunately when the patient load was high there just wasn't much time for teaching."

**Conclusion.** Third-year medical students found that a 2-week rotation on the ID consult service was highly effective in teaching foundational ID content and general medicine skills. Incorporating early learners into a busy and complex subspecialty consult service can be facilitated through the use of supplemental curricular tools such as ID Coaches.

**Disclosures.** Darcy Wooten, MD, MS, Nothing to disclose

**84. Paying for Parenthood: Misinterpretation of ABIM Leave Policies May Lead to Unnecessary Extension of ID Fellowships**

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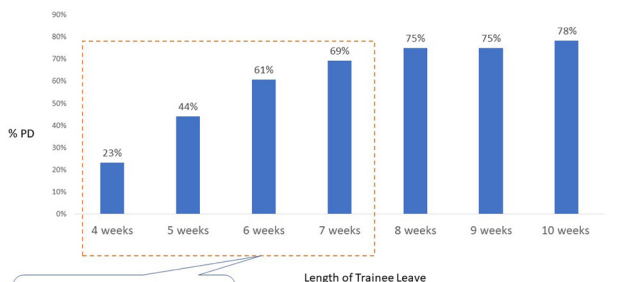
**Session:** O-18. Improving Medical Education in Infectious Disease

**Background.** Many trainees plan pregnancy during fellowship training. A study of internal medicine program directors (PDs) demonstrated frequent misinterpretation of American Board of Internal Medicine (ABIM) leave policies when applied to parental leave. The ABIM has since attempted to clarify its leave and deficits in training policies. The primary aim of this study was to investigate how infectious disease (ID) program directors interpret the current ABIM leave policies in crafting parental leave for trainees.

**Methods.** We surveyed 155 ID program directors in an online, anonymous questionnaire regarding their knowledge of ABIM leave policies and application toward trainees' leaves of absence.

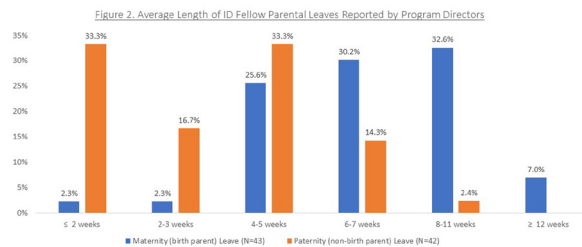
**Results.** 75/155 (48%) of program directors responded to the survey. Most respondents incorrectly identified the leave limits permitted by ABIM policies, and a majority mistakenly chose to extend training when a clinically competent fellow was within their allowed duration of leave. (Figure 1) Most respondents correctly identified that equal time is permitted for both birth and non-birth parent parental leave, however, reported leave durations did not reflect this equity. PDs reported the majority (60.4%) of ID trainee maternity/birth parent leaves at their programs were ≤7 weeks and 4.6% were ≤3 weeks, while only 7% were ≥12 weeks. In contrast, 50% of paternity/non birth parent leaves were ≤3 weeks and none were ≥12 weeks. (Figure 2) PDs utilize various strategies to prevent extending training for fellows taking parental leaves that exceed the limits allowed by ABIM policies, including creating "home electives," though 34% counsel trainees to take "a shorter maternity leave."

Figure 1. % of PDs who would extend training of a clinically competent fellow beyond 24 months based on various trainee leave lengths\*



Per ABIM LOA, vacation and deficits in training policies, competent fellows taking ≤7 weeks are within leave limits and would not require training extensions.

\*Leave calculations based on an ID Fellowship program that provides 4 weeks of vacation per year



**Conclusion.** Fellowship program directors often misinterpret ABIM leave policies, and misapply them when given example scenarios. These findings have clear implications for trainees' family planning and may lead to shortened parental leaves and inappropriate fellowship training extensions.

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

**85. A Virtual Platform for Mentoring Clinician Educators at IDWeek is as Effective as In-Person**

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**Session:** O-18. Improving Medical Education in Infectious Disease

**Background.** Career mentorship for clinician educators (CE) may be difficult to obtain within one's home institution. During IDWeek 2018 and 2019, a mentoring program pairing junior faculty pursuing careers as CEs with more experienced CEs from other institutions was found to be feasible and effective. During IDWeek 2020, the program was transitioned to a virtual format. We assessed the feasibility and efficacy of this virtual mentoring program.

**Methods.** Junior and established CEs were recruited through the IDSA listserv and Medical Education Community of Practice and paired. Mentees completed an individual development plan (IDP) and identified discussion topics for their meeting. Mentors received training on successful mentoring and their mentee's IDP and CV prior to meeting. Mentor and mentees met via videoconference for one hour during IDWeek 2020, created an action plan, and scheduled a follow-up call. Post-participation surveys were sent to mentees and mentors.

**Results.** 30 mentor and mentee pairs were matched; 1 pair did not meet. Compared to IDWeek 2018 (17) and 2019 (20), the 2020 program had more mentees (30). 24 (80%) mentees completed the pre-session survey; 17 (59%) mentees and 20 (69%) mentors completed the post-session survey. When compared to survey results from mentees in 2018-19 who met in-person, mentees in the virtual format reported similarly high rates of satisfaction, planned to make changes at work, had an increase in confidence, and felt it was a valuable experience (Table 1). Mentors also reported high rates of satisfaction with the experience in 2020 and were likely to participate in the program next year (Table 2). Only 1 (6%) mentee reported that the virtual format negatively impacted their experience, although 6 (30%) mentors reported some negative impact of the virtual format (Table 3).

	2018 Mentees, N (%)	2019 Mentees, N (%)	2020 Mentees, N (%)
Created an action plan during meeting	13 (100)	13 (100)	14 (82)
Plan to make changes at work based on meeting			
Strongly Agree	8 (62)	8 (62)	12 (70)
Agree	5 (38)	5 (38)	4 (24)
Neutral	0	0	1 (6)
Satisfied with session			
Strongly Agree	12 (92)	10 (77)	16 (94)
Agree	1 (8)	2 (15)	0
Neutral	0	1 (8)	1 (6)
Mentor had knowledge and experience to provide useful advice			
Strongly Agree	12 (92)	12 (92)	16 (94)
Agree	1 (8)	1 (8)	0
Neutral	0	0	1 (6)
Mentor provided advice not able to obtain at my institution			
Strongly Agree	9 (69)	10 (77)	8 (47)
Agree	3 (23)	3 (23)	7 (41)
Neutral	1 (8)	0	2 (12)
Meeting with coach increased my confidence that I can achieve my career goals			
Strongly Agree	6 (46)	8 (62)	12 (70)
Agree	6 (46)	4 (30)	4 (24)
Neutral	1 (8)	1 (8)	1 (6)
A coaching program for faculty is a valuable resource that IDSA should consider expanding			
Strongly Agree	12 (92)	13 (100)	16 (94)
Agree	1 (8)	0	0
Neutral	0	0	1 (6)

Table 1. Post-session mentee survey responses across 2 in-person years (2018, 2019) compared to the virtual mentoring program (2020)