

Development of an Individualized Pediatric Infectious Diseases (I-PID) Elective Increases Pediatric Resident Participation

ABSTRACT

Background: Infectious Disease (ID) fellowship programs across the U.S. have experienced a recent decline in applicants. During this time, the ID subspecialty has seen an explosion of growth in areas such as transplant ID and immunocompromised host (ICH) ID. In parallel, emerging infectious diseases and healthcare-associated infections have emphasized the breadth of opportunities for the ID clinician. In response to low levels of resident enrollment, creative approaches were sought to increase pediatric resident engagement in ID services at our institution.

Methods: The pediatric ID elective was transformed from uniform participation on an inpatient consulting service, to a varied learning experience based on each trainee's expressed interest. The new Individualized Pediatric ID (I-PID) elective, fully implemented in 2015-2016, offers 4 different clinical tracks: general inpatient ID, ICH inpatient ID, ambulatory ID including HIV care, and a musculoskeletal ID inpatient service. Dedicated learning activities were offered supplementing patient care activities, such as antimicrobial stewardship, infection control/prevention practices and hands-on training in clinical microbiology.

Results: Resident participation in the new I-PID elective increased from 6 residents in academic year 2014-2015 to 16 residents in academic year 2015-2016 (167% increase). The number of enrolled residents that dropped the elective decreased from 9 residents in 2014-2015 to 2 residents in 2015-2016 (78% decrease). During 2015-2016, 9 residents participated in the general inpatient ID, while 6 residents completed an ICH ID elective, and 3 residents rotated in HIV /ID clinics exclusively or in addition to other clinical tracks. Two residents expressed interest in ID career options, including a 3rd year resident who matched in a pediatric ID fellowship program for 2016-2017.

Conclusions: Offering pediatric residents an I-PID elective experience, including involvement in areas such as ICH ID services and ambulatory ID clinics, may have increased their participation in pediatric ID services. Creative approaches to engaging resident participation in a wide variety of ID services during their pediatric training may lead to interest in pursuing careers in ID.

INTRODUCTION

- Infectious Disease (ID) fellowship programs across the U.S. have experienced a decline in applicants since 2010 (see Fig 1), with 41% of ID fellowship programs failing to fill their available positions in 2014.
- During this same time, the ID subspecialty has seen an explosion of growth in areas such as transplant ID and immunocompromised host (ICH) ID. In addition, emerging infectious diseases and healthcare-associated infections have emphasized the breadth of opportunities for the ID clinician.
- The Division of Pediatric Infectious Diseases at UT Southwestern Medical Center, in conjunction with clinical services at Children's Health at Children's Medical Center Dallas, sponsors an elective for pediatric residents, which has also suffered from low enrollment in recent years.
- To encourage pediatric resident exploration in the Infectious Diseases specialty and to accommodate recent movements towards an individualized education during residency training by the ACGME, efforts were undertaken in 2014 to offer a varied clinical experience to match the interest of the enrolled trainee.

Percentage of Unfilled Fellowship Programs in the U.S., 2010 - 2014

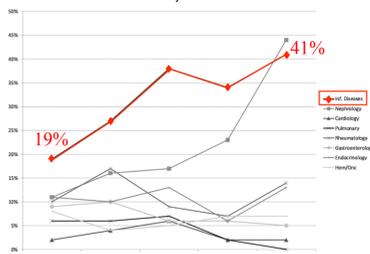


Fig 1. Increase in the percentage of unfilled medical specialty fellowship programs in the U.S. from 2010 to 2014, adapted from Pranatharthi Chandrasekar et al. Clin Infect Dis. 2014;59:1593-1598

METHODS

- The Division of Pediatric Infectious Diseases at UT Southwestern Medical Center, in conjunction with clinical services at Children's Medical Center Dallas, sponsors an elective for pediatric residents.
- Prior to academic year 2014-2015, the Pediatric Infectious Diseases elective was a uniform experience for all trainees, which included up to 4 weeks on the Infectious Diseases General Inpatient Consulting service.
- In 2014, the pediatric ID elective was re-designed to offer the enrolled pediatric residents a chance to explore the wide breadth of clinical services managed by the ID faculty, through the creation of four clinical tracks within the elective (see Fig 2).
- The new Individualized Pediatric Infectious Diseases (I-PID) elective tailored the clinical experience to the interests and long-term/career goals of the trainees.

Clinical Track Options:

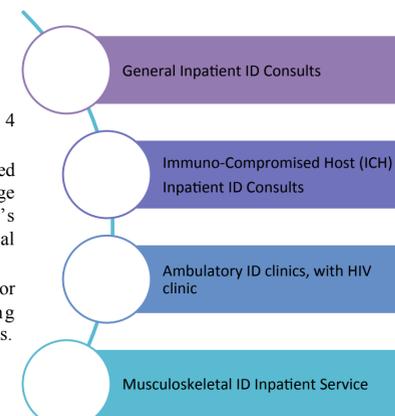


Fig 2. Clinical services available within Individualized Pediatric ID Elective

- The I-PID elective offers 4 clinical track options.
- All clinical services involved patient care through the large free-standing children's hospital, Children's Medical Center Dallas, Texas.
- Trainees may select one or more of the consulting services or ambulatory clinics.
- The I-PID elective curriculum was also expanded to include supplementary educational activities throughout the elective. This expansion also served to introduce clinical ID-based programs, such as antibiotic stewardship and infection prevention and control, to the pediatric trainee.

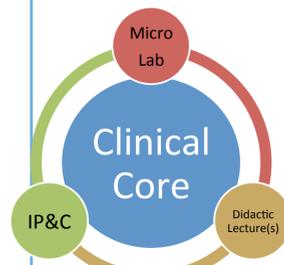


Fig 3. Overview of Individualized Pediatric ID Elective

Individualized Pediatric ID Elective

Clinical Core – Trainees have the option to rotate on any of the 4 available clinical services within ID (see Fig 2).

Supplementary Educational Activities:

- Microbiology Lab at CMC: one-on-one immersion with clinical microbiology technician, to learn basics in bacteriology, virology, and mycology
- Infectious Prevention & Control Introduction: An individualized overview of the roles of IP&C within the hospital, ED, and ambulatory clinics is given by the medical director of IP&C.
- Pharmacology Didactic Lecture(s): Antibiotic lectures are available to the trainees in two forms – one provided by the ID Clinical Pharmacist, and another series available via online course website.

METHODS

- The new Individualized Pediatric Infectious Diseases (I-PID) elective was designed in academic year 2014-2015, but fully implemented in academic year 2015-2016.
- Enrollment status of pediatric residents were documented for each academic year (2014-2015 and 2015-2016), using the first year year as a baseline.
- In addition to enrollment status (completed vs. dropped the elective), each trainee was queried about which clinical track(s) they rotated with, their self-declared learning objectives for the elective, their future career objective, and post-rotation comments.
- Statistical significance of the differences in the proportions of residents completing the Pediatric ID elective was calculated with the Fisher's exact test.

RESULTS

Enrollment:

- The total number of pediatric residents that enrolled in the new Individualized Pediatric Infectious Diseases (I-PID) elective increased modestly by +20% from Academic Year 2014-2015 (n = 15) to Academic Year 2015-2016 (n = 18).
- There was a significant increase in the Academic Year 2015-2016 in the number of pediatric interns/residents who completed the rotation, as compared to the year prior (6 vs. 16, +167% increase, $p < 0.01$), see Table 1.
- This is, in part, may be due to the significant decrease (-78%) in number of pediatric residents that dropped the elective prior to completing the elective in Academic Year 2015-2016.

Pediatric Residents	2014-2015	2015-2016	Change From Previous Academic Year
Completed rotation	6 (40%)	16 (89%)	167%
Dropped	9 (60%)	2 (11%)	-78%
Total Enrolled	15	18	20%

Table 1. Number of pediatric residents who enrolled, dropped, and completed the Individualized Pediatric ID elective during academic years 2014-2016.

Clinical Tracks:

- During the academic year 2015-2016, 9 residents participated in the established general inpatient ID consult track.
- Among the newly created clinical tracks, 6 residents completed an ICH inpatient ID elective, and 3 residents rotated in HIV /ID clinics exclusively or in addition to other clinical tracks.
- One resident participated in the Musculoskeletal ID service, in combination with rotating with the General Inpatient service. (see Fig 4).

RESULTS

Career Goals:

- Long-term career goals following pediatric residency training, specified by medical specialty, were declared by 15 of the pediatric interns/residents that enrolled in the I-PID elective in academic year 2015-2016, see Table 2.
- The most common medical specialties that the rotating trainees demonstrated interest in pursuing were: Hospitalist or General Pediatrics (n = 4), and Hematology/Oncology (n=4).
- Two residents expressed interest in ID career options, including a 3rd year resident who matched in a pediatric ID fellowship program for 2016-2017.

ICH Track by Career Goals:

- Among the newly created clinical tracks, the ICH Inpatient ID clinical track had high interest among the pediatric residents enrolled in the I-PID elective during academic year 2015-2016, second only to the established General Inpatient ID Consultation service (Fig 4).
- The career goals of the pediatric residents who selected the ICH track were examined (Table 2), and we found that this portion of the elected attracted residents who had interest in pursuing careers in Hematology/Oncology, Infectious Diseases, and Allergy/Immunology.

Career Goals by Pediatric Residents Enrolled in I-PID Elective

Medical Specialty	No.	ICH track
Heme-Oncology	4	4/4
Hospitalist or General Pediatrics	4	-
Infectious Diseases	2	1/2
Neonatology	2	-
Allergy/Immunology	1	1/1
Cardiology	1	-
Emergency Medicine	1	-
Endocrinology	1	-
Rheumatology	1	-
Total Respondants	15	

Table 2. Long-term career goals, by medical specialty, declared by pediatric residents enrolled in the I-PID elective during academic year 2015-2016, and proportion who enrolled in the ICH clinical track.

Academic Year 2014-2015:

	Block 1	Block 2	Block 3	Block 4	Block 5	Block 6	Block 7	Block 8	Block 9	Block 10	Block 11	Block 12	Block 13	Total
PEDIATRIC RESIDENTS	Preb-1	Preb-2	Preb-3	Preb-4	Preb-5	Preb-6	Preb-7	Preb-8	Preb-9	Preb-10	Preb-11	Preb-12	Preb-13	15
Dropped	x		x			x		x						9
General Inpatient ID		✓				✓		✓	✓		✓	✓		6
ICH Inpatient ID		✓									✓	✓		2
Ambulatory ID clinics														0
HIV clinic														0
Musculoskeletal ID														0
Completed Elective														6 (40%)

Academic Year 2015-2016:

	Block 1	Block 2	Block 3	Block 4	Block 5	Block 6	Block 7	Block 8	Block 9	Block 10	Block 11	Block 12	Block 13	Total
PEDIATRIC RESIDENTS	Preb-1	Preb-2	Preb-3	Preb-4	Preb-5	Preb-6	Preb-7	Preb-8	Preb-9	Preb-10	Preb-11	Preb-12	Preb-13	18
Dropped							x							2
General Inpatient ID	✓	✓									✓			9
ICH Inpatient ID		✓	✓											6
Ambulatory ID clinics										✓				3
HIV clinic											✓			3
Musculoskeletal ID						✓								1
Completed Elective														16 (89%)

Fig 4. The distribution of the pediatric residents, by clinical track, who completed or dropped the Individualized Pediatric ID elective during academic years 2014-2016.

RESULTS

Post-Rotation Overall Feedback:

- "Thoroughly enjoyed this rotation. The fellow and attendings are excellent and dedicated to resident education and patient care."
- "ID docs seem to love teaching, I learned a great deal on this rotation"
- "... the educational value of the rotation was high, I felt that the short time on the rotation restricted my learning potential"

Excerpts from Question "Learning Experiences you most enjoyed"

- "Antibiotic lecture, Microbiology Lab, Informal teaching on rounds"
- "HIV clinic, refreshing basic understanding of HIV and drugs"
- "Informal teaching with fellows, both the micro [lab session] and antibiotic lecture, and review of current literature on a clinic question regarding one of our patients"
- "Micro lab session, playing an active role on the team and helping formulate plan of care for patients"

CONCLUSIONS

- Offering pediatric residents an Individualized Pediatric ID elective experience, targeting the long-term career goals of pediatric residents, may increase their participation in pediatric ID services.
- Identifying ways how ID training during a pediatric residency may benefit the achievement of those long-term career goals, such as involvement in ImmunoCompromised Host ID services or Ambulatory ID clinics, may also increase pediatric resident participation in pediatric ID electives.
- Over time, creative approaches to engage resident participation in a wide variety of ID services during their pediatric training may lead to interest in pursuing careers in ID.