

Training the Physician-Scientist in Pediatrics

The need for the physician-scientist to develop broad skill sets to successfully transition into an independent, research-based academic faculty position has led to a diverse array of postgraduate training programs in Pediatrics. While some trainees acquire scientific skills during graduate medical education (MSTP; MD/PhD degree), most require additional, post-graduate training to successfully integrate clinical and scientific expertise into an academic program. This level of success is reliant upon being able to effectively balance the development of a program that integrates impactful science with the delivery of high-quality patient care. The need for this complex level of training has led to development models that can be generally categorized as physician-scientist training programs (PSTP) or research-in-residency (RiR) programs.

The PSTP model most commonly integrates pediatric residency and subspecialty fellowship training over a 6-year period of training time. PSTP candidates must demonstrate significant research experience with publications, presentations at national meetings, and (in some cases) a record of research funding. While many PSTPs allow for simultaneous application for residency and fellowship training, most programs do not require that candidates have decided on subspecialty. At some institutions, application through ERAS utilizes a specific NRMP ID number for the PSTP (to distinguish it from the categorical residency program).

PSTPs often incorporate the Accelerated Research Pathway, sponsored by the American Board of Pediatrics (ABP). The ARP combines two years of residency with four years of fellowship (typically one clinical year and three research years, depending on subspecialty). The basic elements of most PSTPs include an organized, longitudinal mentorship plan, financial support for career development needs (travel, computers, etc.), and a core curriculum focused on critical skills to guide mentor selection, data analysis, oral presentation, manuscript writing, and grant submission. Mentorship is achieved via a team approach including the PSTP program director, primary mentor, and basic/translational/clinical faculty. While PSTPs often focus on intensive clinical training during the initial three years of training, mentorship activities and monthly research conferences keep trainees engaged scientifically, allowing for a more seamless transition into the research phase of training. Common goals during clinical training period of PSTPs focus on obtaining clinical skills and knowledge in pediatrics and fellowship while investigating potential laboratories and mentors to promote opportunities for scientific engagement and preparation of institutional funding applications (e.g., for T32 programs).

During the PSTP research years (Years 4-6 depending on subspecialty fellowship), trainees maintain a clinical presence (e.g., a month of inpatient service or a half-day clinic session per week) but have at least 80% of time devoted to research. Most programs continue to provide financial support and some offer salary supplements, allowing trainees to focus on career development without the distraction of seeking supplementary income from outside clinical activities (i.e., moonlighting).

The RiR model attempts to grow the physician-scientist workforce by providing novel opportunities for research training during residency as an “on-ramp” for trainees who become interested in pursuing an academic career. Trainees following this pathway engage in research opportunities ranging from elective training blocks to dedicated, formal integrated programs during residency. Some RiRs offer training opportunities allowing for dedicated research time periods of 12-24 months within a structured research residency program. The NIH Stimulating Access to Research in Residency (StARR) R38 program seeks to recruit talented resident trainees into academic medical careers focused on basic, translational or clinical investigation. Multiple NIH Institutes (including NCI, NIAID, NHLBI, and NIA) have committed to this training mechanism and developed visionary statements for RiRs. Outside the StARR training mechanism, the majority of research training occurs during the fellowship years. Multiple national career development programs (e.g., CDAs from the American Society of Clinical Oncology or American Heart Association) and institutional training opportunities exist for post-doctoral fellows emerging from RiRs, including NIH extramural T32, F32, K12, or KL2 programs.

Umbrella programs are broad initiatives seeking to foster an institutional culture that promotes the growth and diversity of the physician-scientist workforce. These programs provide resources (mentorship, funding, career development, networking opportunities) to trainees at all levels (undergraduate, medical school, residency, fellowship) across a broad spectrum of disciplines, including pediatrics. Many umbrella programs provide a broad curriculum comprising career development sessions, journal clubs, and activities to enhance transitions from one phase of training to the next. As one recent example, the Burroughs Wellcome Fund announced a Physician-Scientist Institutional Award (PSIA) to increase the number of single-degree MDs who enter research training programs. These awards are meant to catalyze institutional efforts to enhance physician-scientist training.