# Building a Research Onboarding Program in a Pediatric Hospital: Filling the Orientation Gap with Onboarding and Just-in-Time Education

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**Abstract:** *An onboarding program is a powerful tool to welcome new employees and support their productivity. Children's Mercy Hospital created a systematic Research Faculty Onboarding Program (RFOP) to engage new research faculty from their first day with the hospital and to shorten the startup time to productivity. Surveys and interviews indicated that onboarding has provided new faculty with a sense of community with the larger organization. The RFOP has four aims: 1) to increase new researcher productivity, 2) to improve retention rates of new faculty by helping them become involved and connected with the organization, 3) to provide audience-specific, in-depth, timely information that is useful and memorable, and 4) to reduce redundant conversations while guaranteeing the delivery of high-quality, consistent, and accurate information. Prior to their start date, faculty receive a web survey designed to communicate the scope of their research and immediate logistical needs. Based on this information, faculty receive personalized quick-start guides, crucial introductions, and logistical setup within their first 10 days. Finally, the program includes a Triage Unit to provide just-in-time training as faculty set up their first research projects. This structured Research Faculty Onboarding Program is competency-based through mentorship and classroom-setting lectures.*

Keywords: *Employee Satisfaction, New Employees, Best Practices*

## Introduction

Expectations of excellence and productivity in academic medical centers can be challenging for new research faculty as they struggle to make sense of their new environment (Birden, 2017; Goldschmidt, Rust, Torowicz, & Kolb, 2011; Ellis et al., 2015). Faculty members, with broad responsibilities that may include clinical care, may be vulnerable to frustrated idleness during their first few months (McCarthy et al., 2016a). New hires nearly always arrive with passion to start their research immediately, but can quickly become overwhelmed by the amount of new information and complexity associated with starting work at a new organization (Klein & Polin, 2012). One study shows that 69% of employees are more likely to stay with the company for at least three years, if they experience a good onboarding program (O.C. Tanner, 2018). Studies also show that a newly hired employee takes an average of eight months to reach full productivity

(Ferrazzi, 2015). This timeframe can apply to both established investigators, as well junior investigators.

*Research Context*

Children's Mercy Hospital (CMH) is recognized as one of the nation's top pediatric hospitals, according to U.S. News & World Report's 2018-2019 "Best Children's Hospitals" report (U.S. News, 2018). Part of its overall academic mission is to be an international leader in pediatric translational research. This commitment has led to a 400% increase in the number of full-time investigators hired annually between 2011 and 2017, as shown in Figure 1. This number is expected to double again by 2020. The biggest catalyst for this growth has been the creation of a new research institute that will incorporate researchers at all levels, both at CMH and at collaborating institutions in the Kansas City, Missouri area. Over the past two fiscal years, a total of 26 newcomers were onboarded. In Fiscal Year (FY) 2017, 10 newcomers elected to participate in the onboarding program. Of those, 60% were female and 40% male. In FY 2018, 16 newcomers elected to participate in the onboarding program. Of those, 38% were female and 63% were male.

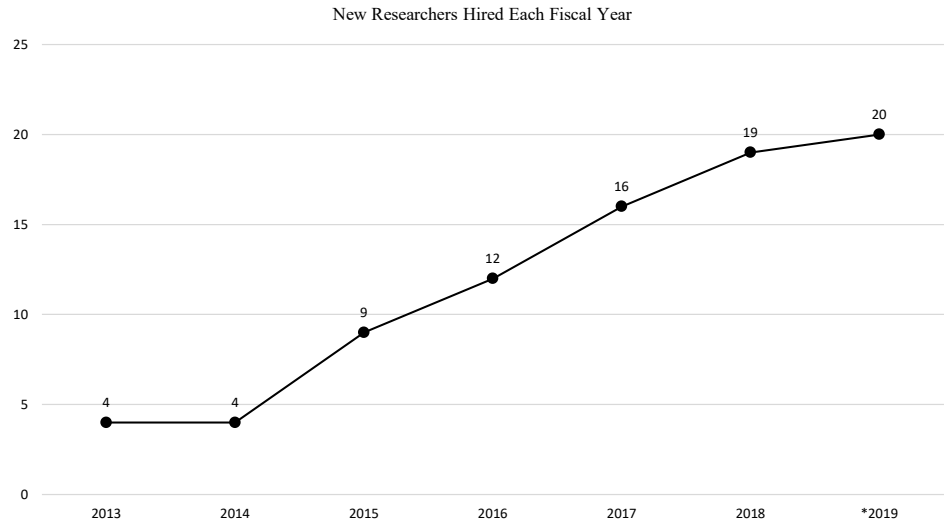


*Figure 1.* Number of New Investigators Hired Each Academic Year.

The Children's Research Institute (CRI) is creating an integrated research environment in a dedicated, state-of-the-art 9-story building with 375,000 square feet, including more than 3,000 linear feet of bench space for research and significant dry space. Construction began in winter 2018 and is expected to be completed by mid-2020. Two generous donations of $75 million each were provided to fund the construction of the future home of the CRI, and to accelerate the recruitment of top researchers from around the globe.

Prior to 2016, research faculty at CMH were onboarded primarily by clinical divisions and had trouble integrating into the research culture. Investigators encountered barriers in building relationships with other researchers and key research administrative staff, such as grants specialists, contract specialists, and grant accountants, and in lacking a clear path or support structure to break down those barriers (McCarthy et al., 2016a).

To address these challenges, CMH created a comprehensive research faculty onboarding program that was first implemented in July 2016. The Research Faculty Onboarding Program (RFOP) is an evolving model with components that may be helpful to other research centers in addressing similar challenges and may serve as a starting point for dialogue across academic medical centers for developing best practices for onboarding. In this case study, we describe the initial challenges, the formation of a working group, the components of the onboarding program, and the ongoing challenges of creating an onboarding program for research faculty.

### *Specific Aims*

The general goal of onboarding is to help new hires understand how to be successful in their day-to-day job and how their work contributes to the overall organization. After reviewing the unique departmental goals and systems currently in place, key stakeholders settled on four specific aims for the RFOP: to (1) increase new researcher productivity, (2) train new research faculty on centralized knowledge critical to the organizational culture, (3) engage new research faculty with the research culture, and (4) connect new research faculty with different research departments throughout the organization. The goal was to provide the necessary tangible and intangible resources to become fully functioning investigators at Children's Mercy.

## Making the Case

### *Definition of Terms*

A critical part of designing the program was distinguishing onboarding from orientation (Garcia, Watt, Falder-Saeed, Lewis, & Patton, 2017; Graybill, Carpenter, Offord, Piorun, & Shaffer, 2013). Our institution, like most academic medical centers, engages new faculty with an orientation program. Orientation is typically characterized as a one-time event. In 2016, employee orientation primarily focused on the newcomer's role in the institution as a general faculty member. The program highlighted the mission and vision of the hospital, but neglected the specific needs of research faculty such as to develop, submit and then administer a grant.

Orientation was a classroom-style event that included information on the hospital's strategic plan, hospital-wide policies, and broad expectations for dress and conduct. The goal for orientation was for the employee to be ready for training wherever they happen to work in the organization. The challenge was that "wherever they happen to work in the organization" was often not prepared to initiate a robust research onboarding experience for research faculty. Many areas had experience onboarding clinicians, but not specifically physician scientists or independent investigators. The advisory committee needed a tool stronger than employee orientation to meet the needs of faculty with diverse research interests and at different academic levels.

Unlike orientation, onboarding is characterized by a series of events (including orientation) that helps newcomers understand how to be successful in their day-to-day job and how their work contributes to the overall organization. Instead of taking place in a classroom, onboarding generally occurs as on-the-job one-on-one interactions between the new employee and their manager (Baldwin, 2016). Onboarding is highly customized and individualized to the new employee. The goal of onboarding is for the employee to feel ready to contribute to the company—not just to understand the company and its mission, vision, values and goals.

*Formation of Committee*

Over the past decade, faculty orientation programs have been delivered by Human Resources and Medical Administration to meet the needs of incoming clinical and research employees. In 2016, at the request of the Executive Director, a multidisciplinary advisory committee met to define the challenges facing all research faculty and especially new research faculty, and to design a framework to foster research faculty development and retention (McCarthy et al., 2016a; Del Giudice, Nicotra, Romano, & Schillaci, 2017).

This advisory committee included representatives from 14 different departments who represent decades of combined research experience, with subject matter experts from the department of Pediatrics, the Office of Research Integrity, Research Education, Research Contract Administration, Grants Administration, Research Technology Services, Research and Grants Accounting, Research Business Operations and Project Support, Institutional Research Safety, Institutional Biosafety, Technology Transfer and Communication, Corporate Compliance and Graduate Medical Education. The group has remained intact with approximately 11 participants who remained engaged over a two-year period between January 2016 and July 2018. The onboarding program was planned to start on July 1, 2016 to coincide with the hospital's fiscal year.

The advisory committee articulated a number of themes they believed would be helpful for faculty: (1) centralized resources to increase new researcher productivity, (2) training on institutional knowledge critical to the organizational culture, (3) a mentoring framework, (4) a just-in-time training platform, and (5) engaging new employees into the research culture. Table 1 indicates the professional needs from an onboarding program. The themes and data were presented to the department chairs, with the strong support of the Executive Director, which endorsed establishing the RFOP. Because retaining excellent and satisfied faculty is more cost-effective than recruitment, the case for creating such a program was compelling (Emans, Teperow-Goldberg, Milstein, & Dobriner, 2008; Baldwin, 2016).

*Table 1.* Professional Needs from Onboarding Program.

| Institutional Professional Needs | What the Research Faculty Onboarding Program Provides |
|---|---|
| Increase new researcher productivity. | Trains new faculty about the research culture and system, allowing them to navigate the system faster and more efficiently. |
| Train new faculty on centralized knowledge critical to the organizational culture. | Provides audience-specific, in-depth, up-to-date and timely information over a short period of time, so that the information is useful and memorable for the new employee. |
| Engage new faculty with the research culture. | Offers opportunities for new faculty to meet one another, thereby involving them in the culture of the organization from an early date. |
| Connect new faculty with different research departments throughout the organization. | Offers a systematic method for introducing new faculty to different research departments throughout the organization, allowing them to get up to speed more quickly with the organization's infrastructure and research business processes. |

### *Stakeholder Engagement*

Integral to the success of the initiative is frequent and honest feedback with our research faculty and support staff (Ross, Huang, & Jones 2014). The advisory committee held conversations with administrative leaders within the departments and individual divisions, current research faculty, and members of the research community in our affiliated universities. The common message was that a long-term investment into a well-crafted onboarding program would increase employee productivity, improve retention rates, provide memorable information, and reduce conflicting redundancies in new employee education.

Perhaps the most robust and important group of stakeholders engaged in the process were the newly hired research faculty themselves. Those who had most recently been hired into the institution most acutely felt the need for a targeted research onboarding program. The advisory committee engaged these new research faculty members with frequent messaging and regularly scheduled face-to-face meetings to give candid and critical feedback about the design for the RFOP. All stakeholder feedback was reviewed by the advisory committee in regularly scheduled meetings. The engagement at multiple levels was a crucial component of the initiative.

## Program Framework

### *Staffing*

The initial infrastructure of the RFOP included a 0.35 full-time equivalent (FTE) onboarding trainer, a 0.20 FTE administrative director, and the advisory committee. The onboarding trainer position was key in providing individual assistance to the newcomer during the orientation phase and in solving day-to-day challenges (Ross et al., 2014). Collaborations were established with the division directors, recruitment officers in Human Resources and Medical Administration, and all research administration staff (Del Giudice et al., 2017). The RFOP reports directly to the Executive Director and the Department of Pediatrics Chair, is a member of the Research Working Group (which meets bi-monthly), and presents data on the progress annually to the

Executive Director and Chief Scientific Officer of the CRI.

### *Target Audience*

Data were reviewed on the number of new academic faculty who actively participate in research. New research faculty facing the most issues were found to be those who were with the institution for fewer than 30 days and who were expected to spend 40% or more of their effort in research, as determined by their offer letter (Langley, Dority, Fraser, & Hatton, 2018).

Research education is provided to various levels of learners throughout the organization, including principal investigators (PIs), co-investigators, and research faculty; research coordinators; postdoctoral fellows; other study staff (clinical vs. non clinical); research office staff; graduate medical students; study team members from outside institutions; and other students, interns, or volunteers. This onboarding program focused exclusively on PIs, co-investigators, and research faculty.

Consideration was given to creating a separate onboarding experience for early career vs. established career faculty because these groups often require different knowledge and have different learning styles. However, ultimately it was decided that these differences could be accommodated within the flexibility of the just-in-time training portion of the program.

### *Curriculum and Collaborations*

The RFOP used a blended learning model with synchronous (instructor-led) and asynchronous (self-paced) learning approaches, as well as e-learning instructional strategies (McCarthy et al., 2016b). We cross-examined all newcomer education currently in place within our organization. This included a general employee orientation, the Educational Office orientation, Quality and Safety education, Clinical Faculty orientation, and New Faculty Orientation provided by the Faculty Development office. After examining the content already being provided across the organization, we isolated the research-specific information that needed to be addressed (McCarthy et al., 2016b).

The research curriculum needed to address the following areas: recognizing research vs. quality improvement, research education requirements, IRB/CITI requirements, software systems, people and support teams, organizational charts, forms, lifecycle and deadlines, human subjects research, lab science, legal agreements, and equipment and facilities. The committee also collaborated closely with other groups in the hospital who are also teaching new employees. These groups included the Office of Faculty Development, Library, Education Office, Research Central Office/Department Administrator, Quality Improvement, Professional Development, as well as Department Associate Chairs, Administrative Directors, and Divisions Chiefs.

As we began to lay the framework for the onboarding program, we conducted several interviews and brainstorming sessions to understand what it means to be a researcher at CMH. We wanted to ensure consistency and continuity throughout the central research office and all department divisions. We used quality commitments, standards and expectations to form a common language around onboarding throughout the organization. It was important to follow the "common

thread" all the way through the onboarding process to ensure that it made sense to outsiders.

### *Just-In-Time Training*

The final phase of the RFOP includes a just-in-time (JIT) training component affectionately called the Triage Unit. The JIT training component is based on this concept of triage—to sort those in-need into groups based on their need for education and their likely benefit from that education. The JIT training component has three distinct platforms: (1) competence—how to do, (2) character—way of being, and (3) technique—way of doing. The competence platform is low-level of accountability and is geared towards those who need beginner guidance and support. The character platform is mid- to high-level accountability and is geared towards those who need direction and counsel. The final capability platform is a high-level accountability program for those who need immediate instruction to complete a vital time-sensitive task.

**JIT Competence Platform**. Most often, JIT training is considered part of the competence platform, offering the new hire general basic instruction, technical guidance, and structured support. The value of this training depends on the coach's skills, the PI's motivation to learn, and the successful transfer of knowledge. Table 2 illustrates the competence platform in the Just-in-Time Training Triage Unit. This platform consists of pre-award training that focuses on how to start a first project. The purpose of this platform is for the new hire to meet and interact with others, to receive knowledge, and to improve performance in their new role. The investigator receives basic instruction on the institutional software and processes related to submitting a grant application, and also receives structured support in problem-solving techniques to use during their first grant submission.

*Table 2.* Just-in-Time Training Triage Unit, Competence.

| Type | **Competence** (How to Do) | |
|---|---|---|
| | **Training / Teaching** | **Coaching** |
| **Example** | Beginner software or institutional processes training, newcomer doesn't know how to work the internal system | Newcomer wants to submit an application in the next 6 months, but is unsure of how to start the process |
| **Focus** | Receiving instruction and guidance | Receiving structured support to find own solutions to issues |
| **Context** | Community and the organization or team | The individual's job and work |
| **Orientation** | Discussion | Probing |
| **Number** | Ten to twenty, Group efforts, systems approach | One-on-one to one-on-twenty, Group efforts, systems approach |
| **Value depends on:** | Attendees learning and transfer of knowledge | The coach's skills and the coach's motivation |
| **Content** | Based on the leader | Based on job needs |
| **Goal** | Goal is collective | Performance improvement |
| **Progress/Pace** | Continuous, Incremental | Depends on motivation |
| **Level of Accountability** | Low level | Low level |
| **Method** | Community (Heart and Mind) | Question and probing (will and mind) |
| **Purpose** | To meet and interact and receive knowledge | To improve performance in role |
| **Resources** | Scheduled Basic Foundational Classes | Advanced Classes on Specific Topics |

**JIT Character Platform**. The second JIT platform is used by more established investigators, or those already familiar with our systems and processes, since they may require encouragement and mentoring more than basic instruction. Table 3 illustrates the character platform in the Just-in-Time Training Triage Unit. This platform offers tools and resources to build constructive research practices. Researchers may be paired with a mentor or asked to participate in a special-interest group or collaboration. The value of this platform depends on the PI's motivation, the mentor's experiences and knowledge, and the application of tools provided. The main purpose of this JIT platform is to develop a growth plan for the new hire to reach full career potential.

*Table 3.* Just-in-Time Training Triage Unit, Character.

| Type | **Character** (Way of Being) | |
|---|---|---|
| | **Counseling** | **Mentoring** |
| **Example** | Application due in 2 months, newcomer aware of requirements but unsure of deadlines | Newcomer has an application started, but wants to consider all options |
| **Focus** | Cognitive and emotional well-being | Giving and receiving direction and evaluating options |
| **Context** | Self-understanding to adopt more constructive research practices | Personal development for future career |
| **Orientation** | Discussion | Application |
| **Number** | One-on-one, Individual ideas, efforts | One-on-one, Individual ideas, efforts |
| **Value depends on:** | The experience and motivation of the counselor and willingness to share | The mentor's experience and knowledge and willingness to share |
| **Content** | Based on client needs | Based on mentee needs |
| **Goal** | Personal well-being and growth investment | Intentional growth investment |
| **Progress/Pace** | Depends on severity of issues | Made by pre-determined goals |
| **Level of Accountability** | Mid-level | Mid to high level |
| **Method** | Direction and leadership (heart, will and mind) | Direction and leadership (heart, will and mind) |
| **Purpose** | Personal well-being and the development of a growth plan | To reach potential in career and life |
| **Resources** | Printed Resources and Checklists | Mentoring Program and Special Interest Groups |

**JIT Technique Platform**. Last, new hires may require JIT training in performing important institution-specific tasks that often arise at the last minute. The third JIT platform is intended to improve task performance and efficiency to perform a task, such as completing a complex internal form. Table 4 illustrates the technique platform in the Just-in-Time Training Triage Unit. This instruction is delivered via one-on-one consultation, or via specialized short instructional videos, lists, or checklists. The value of this JIT platform depends on the PI's motivation, learning, and successful skill application.

*Table 4.* Just-in-Time Training Triage Unit, Capability.

| Type | **Capability** (Way of Doing) | |
|---|---|---|
| | **Performing** | **Managing** |
| **Example** | Application due in 2 weeks, newcomer unaware of deadlines and requirements | Application due tomorrow, newcomer has nothing done |
| **Focus** | Giving instruction and direction to complete a single task | Giving instruction and direction to complete a single event |
| **Context** | The individual's immediate task | Tasks to be done within the role |
| **Orientation** | Skill transfer | Skill transfer |
| **Number** | One-on-one, Individual ideas, efforts | One-on-one, Individual ideas, efforts |
| **Value depends on:** | The attendee's learning and skill application | The manager's authority and skill |
| **Content** | Based on task needs | Based on event needs |
| **Goal** | Job skill development task efficiency | Task completion and efficiency |
| **Progress/Pace** | Depends on skills | Made by pre-determined goals |
| **Level of Accountability** | Mid to high level | High, intense level |
| **Method** | Question and probing (will and mind) | Motivation and management (mind) |
| **Purpose** | To improve task performance | Efficiency and effectiveness |
| **Resources** | Specialized Videos and Checklists | One-on-One |

### *Delivery Format and Marketing Strategy*

Several educational delivery formats are available today. The committee considered the following methods: articles, audio, checklists, email, event, examples, forms, glossaries, infographics, lectures, meetings, policies, printables/handouts, PowerPoint slides, social media, station rotation style events, storytelling, videos, webinars, websites, and workshops. Of these options, an internal website, several printable handouts, an online webinar, and several boilerplate email messages were chosen.

The internal website contained the most important content in the most visible and accessible place for hiring managers and new employees. The website contained information for all newcomers affected by the program. In addition, the website was easily monitored and updated by the onboarding trainers. The printed brochures and information leaflets were also updated by the onboarding trainers. The primary goal of all printed information was usually to drive the target to the internal website. All email messages were uniform in look and wording to ensure

continuity of message.

An important point for us to consider in content delivery was the power of public relations and face-to-face interactions. The key to individualized content is a steady flow of interesting and relevant material. Once the framework and basic structure of the onboarding program was finalized, the committee considered the marketing strategy for the initiative.

Finally, we used promotional branding to define the program to our faculty. Our core message and image was embedded in the four phases of the program: Discover You, Discover Our Research, Discover Your Research Here, and Discover Community. Newcomers value participation, seek validation of their decision to move, and need information. Faculty in general are looking for pride in association, awareness among peers, and recognition of their work and publications. The four phases of the program focused on our target audience by addressing the combined needs of both newcomers and established faculty.

## Instrumentation

Given the complexities presented by each individual researcher entering a new institution, the advisory committee needed to design a program flexible enough to accommodate every researcher, no matter where they were coming from, whether they were a young or established investigator, or what department or division they were settling into. In order to be successful, we needed to build a framework that could be activated prior to the employee's first day and flexible enough to be used in a variety of situations. This flexibility was possible because of the onboarding survey that serves as the foundation for the rest of the onboarding program (Garcia et al., 2017).

The onboarding survey communicates vital information about a new employee's research, their immediate startup needs, and any action steps (such as data transfer) that may need to be taken prior to their last day at their previous institution. The survey is completed online and contains 10 sections. The survey requests only the most vital information about the new researcher and their research enterprise. The survey has 49 questions and is delivered via REDCap© (a free, secure, web-based data capture and survey system). The survey takes an estimated 10 minutes to complete depending on the nature and breadth of the new employee's research enterprise.

Once the survey is completed and returned to the onboarding trainer, key members of the advisory committee, the CRI, and the relevant Department are then notified of the new researcher's start date and provided all vital information in the survey.

The onboarding trainer uses the information provided in the online survey to build a custom onboarding experience for the new hire. For example, if the survey reveals that the new hire is an established investigator who has permission to start a laboratory at CMH and plans to use radioactive materials, their onboarding would focus on the Institutional Biosafety protocols and include substantial face-to-face time with the Biosafety Officer and staff. However, if the survey reveals a young investigator with plans to submit a grant application, the onboarding experience would focus more heavily on introductions to the pre-award staff and enrollment into the mentorship program. Table 5 shows all questions asked on the 2016-2018 researcher onboarding survey.

*Table 5.* Onboarding survey.

| **Researcher Onboarding Survey** |
|---|
| This survey is designed to aid in the onboarding process by providing us with a brief overview of the nature of your research activities. The primary intent of collecting this information is to make grant transfer and preparation for your research activities go as smoothly as possible upon arrival at CMH. |
| **People and Places** |
| **Section 1: Basic Information** |
| 1. Please list your full name and credentials: (First M. Last, Credentials)<br>2. Please list your expected start date at Children's Mercy Hospital: (MM-DD-YYYY)<br>3. What organization are you coming from?<br>4. Please list your research interests: |
| **Section 2: Clinical Trials, Research Operations, and Research Development** |
| 5. Children's Mercy has central research coordinators available to help support clinical trials in a short-term capacity. Are you interested in hearing more about this service?<br>6. Are you bringing or will continue collaboration with post docs or other trainees (e.g. MD Fellows, training grant fellows, etc.) from your current institution to CMH? If yes, please provide a brief description of personnel and their level of training:<br>7. Does your current research involve an Investigational New Drug (IND) or Investigational Device Exemption (IDE) application?<br>8. Do you currently hold any IND or IDE that will not be closed with the FDA prior to your arrival at CMH? If yes, please provide a brief description of your IDE or IND. If yes, is the IND/IDE in good standing?<br>9. Do you plan to use any of the research clinical or research laboratory facilities at CMH?<br>10. Do you plan to use any investigational drugs in your research? If yes, please provide a brief description: |
| **Sponsored Research** |
| **Section 3: Sponsored Projects and Research Management** |
| 11. Do you have any grants and/or awards that must be transferred to CMH from your current institution? If yes, please provide a brief description of the grants and/or awards (specifically sponsor, full title, and full performance period):<br>12. Please provide contact information for the research staff office at your previous organization including a name and email address.<br>13. Are you submitting any award applications immediately before or upon your arrival? If yes, please provide a brief description and indicate the sponsor, application due date, and RFA number, if available:<br>14. Do you have, or are you submitting any grants and/or awards under contract with the Department of Defense (as a primary contractor or subcontractor)? If yes, does the contract require that CMH possess a Facility Safety Plan registered with the DoD? |

15. Do you have any other agreements under which work will continue once you are at CMH (i.e. consulting, storage, etc.)? If yes, please provide a brief description of the agreement(s):
16. Do you have capital equipment purchases (purchase of more than $5,000) that you plan to make before or immediately upon arrival at CMH? If yes, please provide a brief description of the capital equipment purchases:
17. Please list all specialized equipment (e.g. freezers, carbon dioxide incubators, biosafety cabinets (BSC, or "tissue culture hoods") hoods, mass spectrometers, cell sorters, etc.) that you plan to bring to CMH. Please indicate model name, number and serial number, if available.
18. Do you need to move any materials (e.g. frozen samples, cell lines, lab chemicals, bio-hazardous materials, animal tissues, etc.)? If yes, please provide a list of all materials. Identify if materials include infectious agents, Risk Group 3 materials, toxins, and/or recombinant or synthetic nucleic acid molecules.
19. Do you have specialized equipment that will require an emergency power source (i.e., -80 degree and -20 degree centigrade freezers, carbon dioxide incubators, etc.)? Please list each item that will require an emergency power source:

**Active Protocols**

**Section 4: Animal Research Management**

20. Do you have any IACUC protocols to transfer or submit upon your arrival? If yes, please provide a brief description of the protocol. Indicate if the protocols will involve recombinant or synthetic nucleic acid molecules (includes transgenic animals).
21. List all research animals you would like to transfer to UMKC. NOTE: CMH small animal research is conducted through University of Missouri Kansas City (UMKC). Indicate if the animals are transgenic, have been inoculated with or otherwise exposed to recombinant or synthetic nucleic acid molecules.
22. During the conduct of your research, will you be transporting animal tissues or cells from animal facilities other than UMKC to a CMH laboratory?
23. If yes, please describe. Include if animal materials are transgenic, if they contain infectious agents or other recombinant or synthetic nucleic acid molecules.

**Section 5: Institutional Review Board (IRB) Protocols**

24. Do you have any current Institutional Review Board (IRB) protocols to transfer or submit upon your arrival? Or any studies that you will continue to work on from your previous IRB? Please describe the protocol and also note if the original IRB will remain the IRB of record:
25. Are you bringing any de-identified data sets with you on which you anticipate further analysis activity and which will need a Data Use Agreement? If yes, please provide a brief description:
26. Do you plan to transfer current or submit new Human Gene Transfer protocols?
27. Will your IRB protocol involve laboratory research procedures conducted at CMH (Includes sample processing; does not include Standard of Care laboratory testing)? If yes, please provide a brief description:

| **Section 6: Institutional Biosafety Committee (IBC) Protocols:** |
|---|
| 28. Does your offer letter grant permission for you to start a new research laboratory (wet or dry) at CMH? |
| 29. Will you be joining an existing research laboratory at CMH? |
| 30. Please identify the CMH laboratory and provide a brief description of the research, focusing on the research materials and procedures. |
| 31. Will you be bringing equipment that may contain radioactive materials (e.g., Geiger counters, liquid scintillation counter, irradiator, electron capture detector, etc.)? |
| 32. Do you plan to use Risk Group (RG) 3, RG4 etiologic agents, Select Biological Agents, or Toxins (SBAT) in your research? If yes, please provide a brief description: |
| 33. Do you plan to conduct research involve radioisotopes or radioactive materials (RAM)? Please provide a brief description including the identity of the isotope(s). |
| **Technology Services** |
| **Section 7: Technology Services** |
| 34. Are there any specialty computer purchases that you will need to make specifically for your research activities (aside from a standard desktop) upon your arrival at CMH? If yes, please provide a brief description of the computer equipment: |
| 35. Are you bringing computers(s) or any specialized technology equipment with you to CMH? If yes, please provide a brief description of the computer equipment, including if possible name, model and serial numbers: |
| 36. Will you need to transfer data from your previous organization to Children's Mercy? |
| 37. How much data storage do you envision you will need for your first year at Children's Mercy?<br>a. None<br>b. 10 GB Flash Drive<br>c. 1 TB External Hard Drive 1 TB Network Storage<br>d. 1 PB Extensive I Don't Know |
| 38. Do you have any externally housed data that will need to be brought into the CMH system (data saved outside of your previous organization)? |
| 39. Do you have any current specific software needs?<br>a. Software available for purchase through an existing vendor<br>b. Existing custom software created by yourself or your previous organization<br>c. New custom software not yet created<br>d. None at this time |
| 40. Please provide additional information about your software: |
| 41. Describe any technology related needs that are not previously covered: |

| **Section 8: Office of Technology Transfer and Commercialization** |
|---|
| 42. Do any of the following apply to you or your Research?:<br>a. research materials such as cell lines, antibodies, etc.<br>b. corporate sponsored research programs<br>c. research that may lead to patents or licensing<br>d. a startup company based on your research<br>e. research involving Clinical Trial Agreements |
| 43. Have you submitted an invention disclosure on your research with a previous institution? |
| 44. Are you listed as an inventor on any patent applications or issued patents? If yes, do you plan to continue this research at CMH? |
| **Research Compliance** |
| **Section 9: Conflict of Interest and Research Compliance** |
| 45. Do you have a significant relationship (i.e., consultant, speaker's bureau, advisory board, etc.) with an sponsor or a sponsoring organization that may pose a conflict of interest? |
| 46. In the past 10 years, has a study you have been involved in been inspected and/or reported for non-compliance to any external entities such as the FDA, OHRP, EMA, NIH, or similar organizations? |
| **Final Comments** |
| **Section 10: Final Comments** |
| 47. Would you like to meet with someone regarding any of the following issues during your first month at Children's Mercy Hospital? |
| 48. Describe any research related needs or questions that were not previously covered: |
| 49. Please upload any requested or relevant files. |

Section 1 of the research onboarding survey includes four questions asking for basic information about the new employee, including name, contact information, research interests, and expected arrival date. This information allows the orientation trainer to confirm the identity of the new arrival and gain contact information for all communications prior to the first day of employment. It also allows the trainer to begin making connections with potential mentors and collaborators within the institution that share interests. Mentors were selected based on the newcomer's clinical division and academic rank.

Section 2 covers clinical trials, research operations and research development plans. This section asks two questions regarding the use of a research coordinator and/or any continued collaborations with any post docs or other trainees from the previous institution. This section also asks three questions regarding the use of an Investigational New Drug (IND) or an Investigational Device Exemption (IDE) application. The newcomer is also asked to clarify if they plan to use any of the research clinical or research laboratory facilities at CMH.

### *Sponsored Research*

Section 3 of the research onboarding survey has nine questions relating to sponsored projects and research business management. This section also asks questions regarding current grants and awards that must be transferred to CMH from their current institution. New employees are asked to describe the grants and/or awards with special attention to sponsor, full title and full performance period of the project. They are also asked to provide the name, address, and phone number for the research staff office at their previous organization where the work is currently being performed. This section also requests information on any grant proposals that the new employee may plan to submit within the first three months of arrival. Last, this section covers any large capital equipment purchases (greater than $5,000) or specialist equipment purchases (e.g., freezers, carbon dioxide incubators, and biosafety cabinets) that they may plan to make prior to, or immediately upon arrival at CMH. The responses allow our facilities team to prepare for incoming equipment and equipment that may require an emergency power source (e.g., -90 degree and -20 degree centigrade freezers, and carbon dioxide incubators).

### *Active Protocols*

Section 4 of the survey has four questions on any planned animal research management. The new employee is asked about any IACUC protocols that they may have or plan to transfer or submit upon their arrival. The new employee is also asked whether animal tissues or cells will need to be transported from external animal facilities, and whether those animal materials are transgenic, or if they contain infectious agents or other recombinant or synthetic nucleic acid molecules.

Section 5 of the survey includes four questions from the Institutional Review Board (IRB) office regarding any current IRB protocols that will need to be transferred upon the new employee's arrival. This section also includes questions regarding the continued analysis on de-identified data sets. Last, this section asks for any needed information regarding the transfer of current or new Human Gene Transfer protocols.

Section 6 of the survey poses six questions from the Institutional Biosafety Committee (IBC) regarding any equipment or research to be performed in a laboratory. Information regarding radioactive materials (e.g., Geiger counters, liquid scintillation counter, irradiator, and electron capture detector) and Risk Group (RG) 3 or RG4 etiologic agents or Select Biological Agents or Toxins (SBAT) is collected within this section.

### *Technology*

Section 7 focuses on technology services and includes eight questions regarding specialty computers, technology or equipment that the researcher is bringing with them or will need upon arrival. This section also includes information about how much data the employee will need to transfer from their previous institution and how much storage space they will require (e.g., 10 GB Flash Drive, 1 TB External Hard Drive, 1 TB Network Storage, 1 PB Extensive, etc.). The employee is also asked if they have any externally housed data that will need to be brought into the CMH system (data saved outside of their previous organization). Any software needs are also communicated in this section.

Section 8 comes from the Office of Technology Transfer and Commercialization. Three questions include information about the use of research materials such as cell lines and antibodies, corporate-sponsored research programs, research that may lead to patents or licensing, a startup company based on their research, and research involving Clinical Trial Agreements. Questions are also included regarding inventions, patent applications, or issued patents.

### *Compliance*

Section 9 includes two questions about conflict of interest and any reports of non-compliance from any external entities such as the FDA, OHRP, EMA, NIH, or similar organizations.

### *Closing*

The 10th and final section of the survey includes three questions that allow the employee to request meetings with specific research offices, describe any questions or comments not addressed elsewhere in the survey, and to upload any relevant documents (e.g., protocols and CV).

## Implementation

The onboarding program is implemented in four phases (Langley et al., 2018). With completion of each phase, the focus shifts from a broader understanding of research issues to fundamental project management, including progressively more complex activities and productivity requirements (Langley et al., 2018). Phase I begins when the offer letter is accepted, focuses on assessment and triage of critically important startup details, and has minimal expectations for new knowledge acquisition. The Phase II goal is to provide the newcomer with increasing autonomy, experience, and expectations in the conduct and management of research. Phase III continues the expectation of self-directed learning while the newcomer begins to practice research independently. Last, the Phase IV goal is continued mentorship, which allows the newcomer the freedom to discuss expected and unexpected research issues with the assigned mentor.

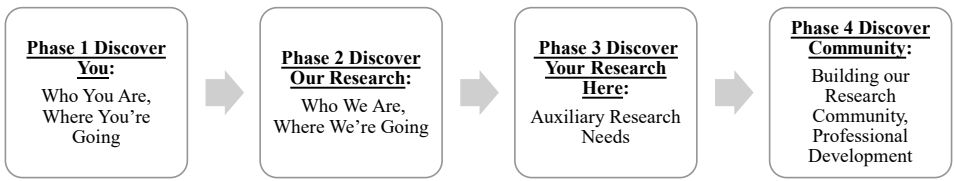


*Figure 2. Phases of the Research Faculty Onboarding Program.*

### *Phase I: Discover You*

Phase I takes places once the employment contract has been finalized. During this stage, the newcomer is preparing to move to CMH. This stage addresses the technical and organizational logistics of moving research and equipment from one institution to another. During this stage, it is important for the mentor and onboarding trainer to take time to get to know the newcomer and their career goals. This is also a good time to discuss productivity and effort expectations with

the newcomer.

Phase I includes the online survey, transfer of data and sponsored projects, and basic research orientation. After the offer letter has been signed, the employee is asked to complete the onboarding survey that asks about their current and future research needs. This survey will form the foundation of the rest of the onboarding experience for that faculty member. Once the newcomer completes and returns the survey, the onboarding trainer will process the survey results and communicate the newcomer's information to the rest of the onboarding team. Prior to their first day, the onboarding trainer will work with the newcomer to transfer data via the cloud to eliminate the need for external hard-drives.

On the first day of employment, the new employee receives an email welcoming them and their research to the institution. The email contains information regarding their personal onboarding trainer and informing them about the RFOP. This first email is informational, intended to welcome the new employee to the RFOP and let them know that an onboarding program has already been activated for them. The welcome email states that their onboarding trainer will contact them in a few days to begin scheduling a few introductory meetings. It acknowledges that the first month of a new job can be stressful, and that we want to make this transition as seamless as possible.

During this phase, the newcomer will be required to complete the online research orientation. CMH requires a basic research orientation for anyone prior to their participation in research activities. For new hires, this has included watching two online self-learning modules: Research Bootcamp and Research BrushUp (Carcich & Rafti, 2007; McCarthy et al., 2016b). Bootcamp topics include organizational structure and systems, responsible conduct of research, compliance, budget and patient care charges, the protection of human subjects, research accounting, and conflict of interest. BrushUp is updated yearly and is a mechanism to communicate any updates or changes throughout the organization in the last year. This could include changes to pre- or post-award procedures, research education elective notices, modifications to internal deadlines, a compliance review of the most common mistakes of the past year, and updates on upcoming process changes. Together, these two modules communicate all necessary research education to anyone new to research in the organization.

*Phase 2: Discover Our Research*

Phase II takes place within the first two weeks of employment. The focus is an introduction to research, giving an overview of research, our institutional processes, technology systems, oversight committees, and educational requirements. This phase provides a warm-up to the culture and equips the new faculty with basic research knowledge.

All new researchers will meet one-on-one with a specific core set of leaders and research staff. However, based on their online survey data, additional auxiliary meetings may be required based on the researcher's individual needs. This process highlights the true flexibility of the RFOP.

All faculty meet with the onboarding trainer for an overview of the research lifecycle at Children's Mercy, allowing the new employee to see the systems and programs used to complete a project

from start to finish. All employees also meet with the Office of Research Integrity for an overview of human research protections, with Research Education to ensure they understand the requirements prior to starting research activity, and receive a group introduction to Research Business Operations (Legal, Accounting, Patient Care, and Grants Specialist). Together, these meetings create the core foundation of the RFOP.

Optional meetings may also be scheduled based on the individual employee's needs. These meetings could include face time with our Intellectual Property team, Conflict of Interest, Research Contracts, Biosafety, Research Accounting, Graduate Medical Education, and Research Pharmacy.

*Phase 3: Discover Your Research Here*

Phase III takes place within the first six weeks of employment. The focus of this phase is in-depth, specialized, and research-specific introductions. A suggested agenda and meetings times are sent to the newcomer to ensure faculty want and can attend onboarding meetings. Meetings are tailored to the specific and individual research needs of the faculty member and are designed to get that faculty's research up and running as fast as possible. Meetings may include specialized consultations with technology services, research contracts, grant specialists, and many other auxiliary offices. The Executive Director of CRI strongly recommends the program to all newcomers during and after recruitment.

After all the onboarding introductory meetings are completed, the onboarding trainer follows up with the new employee to answer any lingering questions or discover any ongoing transition issues. The onboarding trainer will also contact everyone the new employee met with to discuss any impressions or issues from their meetings that may need follow-up or further clarification. The onboarding trainer will continue to visit with new employees as they transition their research and begin their career at Children's Mercy. Once all onboarding meetings have been completed and any continuing issues have been resolved, this phase of the new employee's onboarding is considered complete.

*Phase 4: Discover Community*

Phase IV takes place within the first eight weeks of employment and lasts for six months. The focus of this phase is to introduce the newcomer to fellow researchers with similar interests and connect them with the larger research community. Topics covered in this phase include exploration of mentorships and collaborations, technology development, public and patient engagement, and professional development. The Just-in-Time Education program, explained previously, is also included within this phase.

The final step of the onboarding program is to follow up with both the newcomer and the onboarding team to get their impressions and feedback on the program, bring closure to any ongoing issues, and clarify future expectations for research development, such as upcoming grant deadlines.

## Results

### *Pilot Testing*

RFOP was presented to two newly hired research faculty members. Research faculty came from two different institutions and from two different areas of research. The pilot testing was successful and the RFOP was met with voiced appreciation. Our pilot faculty emphasized problems with information management and technology, citing prodigious difficulty in transferring data and information over to CMH from their previous institution and difficulty with getting their new computers and software installed in order to begin their research at Children's Mercy.

Based on this feedback, we added three questions to our online survey to assess the amount of data the new hire would need to transfer and any special software or computer needs. We also added specific information about transferring data in the very first communication after the offer letter is signed. Last, we created an onboarding checklist for division staff that included instructions for ordering computer hardware and research software prior to the new hire's arrival. Since research information technology is often more complex and different from the average office technology, a liaison from the Research Informatics team was assigned to the advisory committee onboarding stakeholder group. Together, these changes fortified the onboarding process to ensure future success for those elements related to information management and technology.

## Discussion

The RFOP was designed to inform new research faculty about the research culture and system, allowing them to navigate the system faster and more efficiently. The training provided audience-specific, in-depth, up-to-date and timely information over a short period, designed to be useful and memorable for the new employee. The RFOP offered a systematic method for introducing new research faculty to different research departments throughout the organization, allowing them to get up-to-speed more quickly with the organization's infrastructure and research business processes.

A research faculty onboarding program has the potential to bring a consistent and high level of service to new research faculty, while minimizing employee turnover and compliance risk. The RFOP sought to reduce newcomer uncertainty and anxiety through knowledge and interaction. The program also provided new employees with the necessary tangible and intangible resources to become fully functioning PIs at Children's Mercy. Over the last two years, we have onboarded over 39 new research faculty members. Based on information provided from faculty recruitment and subsequent effort reports, the RFOP has been a valued addition to the research program. Flexibility and adaptability is key to the RFOP's continued success. All materials are reviewed quarterly to ensure the program continues to provide timely information that is useful and memorable.

### *Lessons Learned*

For the first year, the advisory committee agreed to target only new faculty who were promised 40% or more research effort in their initial offer letter (Langley et al., 2018). This translated to 16

new faculty members who were approached to participate in the research onboarding program. Of the 16 surveys sent out, the RFOP received 12 online onboarding surveys in response. Of those 12 respondents, 10 faculty chose to have the full onboarding experience in the first year. The two research faculty who completed the survey but ultimately declined onboarding were hired from partner institutions in the immediate Kansas City area. They felt that onboarding was not necessary as they already had substantial organizational knowledge.

In the second year of implementation, the enrollment criteria for the onboarding program changed. In 2017, all new research faculty, regardless of research effort, were entered into the onboarding program. The program also included not just new hires, but all PIs, co-investigators, or research faculty participating in research activities at CMH for the first time. This inclusion opened the door for existing clinical faculty who had recently decided to conduct research for the first time. All investigators were required to complete onboarding prior to engaging in research activities. An investigator was considered new if they were new to CMH and this is the first protocol application submitted through the institution. This translated to 19 new faculty members who were approached to participate in the research onboarding program. Of these, 10 received the full onboarding experience in the second year.

Other changes made in the second year included an updated Research Orientation module to replace the original two-part Research Bootcamp and Research BrushUp modules. The new broader orientation module included an overview of research leadership, areas of institutional research emphasis, information on organizational structure and business operations, as well as information on the protection of human subjects, research compliance, and scientific misconduct.

### *Future Considerations*

The RFOP was designed under Children's Mercy Hospital (CMH) in 2016 and was fully absorbed into the new Children's Research Institute (CRI) in early 2018. The CRI will be responsible for providing a high-quality onboarding experience for all new faculty involved in research. It is important to mention that the RFOP was created when the CRI hired only 4-6 researchers per year. The program is much more critical now that CRI expects to hire several new researchers each year in 2019 and 2020. In the coming years it will become increasingly important for the RFOP to be refined and improved.

As it evolves, the RFOP will need more data and metrics to ensure that the program is working and continues to deliver a valued experience. The moment when a newcomer has truly met the objective of being ready to contribute to the organization is a difficult target to define. The association between the onboarding intervention and the total startup time between the start date and the point in which the new investigator's laboratory is fully functional needs to be examined in order to collect quantitative data and keep metrics. The just-in-time training component was initially designed to allow further growth and expansion. We hope to include a more robust mentoring and coaching system for new investigators in the next year. Last, once the employee's onboarding is considered complete, they will respond to a feedback form to make sure the RFOP continues to meet its goals.

## Conclusion

One essential key to a successful onboarding program is communication prior to employment, in order to prepare for the needs of the researcher ahead of time. Institutions seeking to design an onboarding program for new investigators should consider making contact with the researcher as soon as the offer letter has been accepted. A blended program with both online modules and one-on-one interactions is also recommended. The online modules should be brief, helpful, informative, and easy to complete. Individual meetings should be planned as a half-day session (morning or afternoon) for ease of scheduling and out of respect for the new employee's time. All program materials should be reviewed regularly for redundancy and relevancy. The onboarding program should seek to: 1) increase new researcher productivity, 2) improve retention rates of new research faculty by helping them become involved and connected, 3) provide audience-specific, in-depth, timely information that is useful and memorable, and 4) reduce redundant conversations while guaranteeing the delivery of high-quality, consistent, and accurate information.

## Authors' Note

The authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest in the subject matter or materials discussed in this manuscript.

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