

We anticipate an increase in numbers of well-qualified, diverse applicants who pursue CRP careers locally and regionally. In addition, we expect that the certificate program will build competency earlier in CRP staff, improving job satisfaction and retention as a result of a stronger foundation from which to build their professional skills.

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Reimagining Entryways: Innovative Apprenticeship Models for New Clinical Research Professionals

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OBJECTIVES/GOALS: 1. Standardize pathways, training and evaluations 2. Expose apprentices to a variety of research experiences 3. Remove barriers to hiring early talent 4. Expand opportunities for underrepresented minority applicants to obtain clinical research professional positions **METHODS/STUDY POPULATION:** Collaborators connected by the Clinical Research Professional Taskforce ACTS SIG conducted a landscape analysis survey to identify aspects of CRP Apprentice models and formed a Subgroup. Members will share plans for multiple apprenticeship programs, including specific training modalities and skill sets used to prepare apprentices for a successful clinical research professional career. **Methods across institutions include:**

- Increasing awareness of the profession
- Facilitating talent identification for managers
- Making the business case for funding and staffing
- Implementing work-based learning for fundamental competency development

Survey results from CRP institutions demonstrated apprenticeships are value added to teaching how to conduct research. RESULTS/ANTICIPATED RESULTS: The landscape survey of Apprentice programs revealed multiple models in use. The newly formed Apprentice subgroup is engaging in analysis and actively working to build a standardized repository of competency-aligned, research courses and experiences for apprentices. Results will help make the business case for starting or growing programs. Subgroup members have focused on a shared goal of expanding opportunities for underrepresented minority applicants, with current outreach efforts that are extending awareness of the CRP profession. We anticipate a continuous strengthening of connections between institutions to share a variety of models to implement, develop shared tools (e.g., proficiency tests), and share existing tools to standardize pathways and training for CRP apprenticeships. #_msoanchor_1 **DISCUSSION/SIGNIFICANCE:** Academic Medical Centers (AMCs) need novel strategies to support clinical research portfolios. Innovative Apprenticeship Models improve efficiency and sustainability of the clinical research professional (CRP) workforce to train the next generation of CRPs in an effective and timely way.

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Strategies for Training and Advancing under-represented Researchers (STARs)

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OBJECTIVES/GOALS: Minority faculty have inequitable access to information, professional development, and research resources.

A structured research-mentoring program could help strengthen the research acumen of underrepresented (UR) faculty, provide a community, and support to ensure their success in becoming independent investigators. **METHODS/STUDY POPULATION:** The Translational Research Institute (TRI) STARs program aims to build a peer support community of UR in biomedical, clinical, behavioral and social sciences to support career development and research success. The program provides a structured peer support group with a 3-month grant training and development program and addresses issues of isolation often felt by UR faculty in academic settings. It encourages the development of innovative research ideas in a safe environment. This peer support group can also help improve confidence and self-efficacy in clinical and translational research development and execution by UR faculty. At the didactic program's conclusion and seed grant application submission, STARs provides \$10,000 as a TRI DEI Equity, Diversity, and Grantsmanship Expertise project. **RESULTS/ANTICIPATED RESULTS:** Since its launch in 2021, 11 scholars have enrolled in the program; three have fully completed the program, and all three have received subsequent grant funding. Four scholars have completed the didactic program and are in the process of using seed funding to collect initial data and working on initial publications. The remaining scholars are currently in the didactic program. Initial scholar satisfaction with the program is high: 100% reported satisfaction with their participation (Very Satisfied/Satisfied), and 100% agree the program provides adequate support to their research project (Strongly Agree/Agree). Overall, scholars reported an average increase in confidence of 7.9% in grantsmanship skills (Scale 0-10). The return on investment is 3106%, with over \$1.9 million in subsequent funding. **DISCUSSION/SIGNIFICANCE:** Research shows diverse teams working together, capitalizing on innovative ideas, and distinct perspectives outperform homogenous teams. Our preliminary experience demonstrates success for the model. Additional, long-term support will be further developed to address additional challenges experienced by UR faculty across their careers.

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Differences in nurse documented versus reported early mobility for critically ill children

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OBJECTIVES/GOALS: In 2014, Johns Hopkins Pediatric ICU (PICU) implemented the PICU Up! early mobilization program. Subsequent studies have shown that these protocols increase mobility of PICU patients. Process improvement requires accurate documentation. Our aim is to evaluate differences in nurse documented and actual reported mobility of PICU patients. **METHODS/STUDY POPULATION:** A quality improvement project evaluating the impact of a simulation-based early mobility training program is being conducted, with initial analysis of pre-intervention data. Inclusion criteria includes children age 1 day to 17 years old admitted to the PICU for ≥ 3 days during a day shift and exclusion criteria includes specific mobility contraindications. Data on the number of daily mobilizations, highest level of mobility achieved during each mobilization, and occurrence of safety events is captured via direct query of the bedside nurse at the end of a 12-hour shift by a research

team member using a standard data collection tool. We also recorded documented events in the electronic medical record (EMR). Paired t-tests were performed for continuous data and McNemar's test for categorical data. RESULTS/ANTICIPATED RESULTS: In total, 50 patients were enrolled between February and April 2023. The nurses reported that patients participated in a median of 5 mobilizations (Interquartile range [IQR] 4-6) in a 12-hour shift, whereas nurses documented in the EMR that patients participated in a median of 1 mobilization (IQR 0-3; $P < 0.001$). On direct query, the nurses stated that a total of 8 individual safety events occurred during mobility, representing a 3% (8/259) safety event rate. In the EMR, the nurses documented 1 individual safety event during mobility, representing a 1% (1/84) safety event rate ($P = 0.008$). Nurses reported that they mobilized 50% (25/50) of the patients out of bed; however, they documented that they mobilized only 32% (16/50) of the patients out of bed ($P = 0.007$). DISCUSSION/SIGNIFICANCE: Compared to EMR documentation, nurses report more mobilization of critically ill children during the day, including more out of bed mobilization and safety events. Future nurse education should focus on mobility documentation to ensure that it reflects mobility at the bedside to facilitate process improvement and optimize care for PICU patients.

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Applying the Competency Index for Clinical Research Professionals (CICRP) for Educational Program Evaluation

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OBJECTIVES/GOALS: To demonstrate the value of the Competency Index for Clinical Research Professional (CICRP) as a tool in program evaluation using a pre- and post- design to evaluate student perceived self-efficacy in clinical trial competencies at program entry and at program completion. METHODS/STUDY POPULATION: Using a separate-sample pre-post study design, we administered the CICRP questionnaire to students in the entry and exit courses of the Master of Clinical Research (MCR) Program during the 2021-2022 academic year, using Qualtrics™ (Provo, Utah) survey instrument for use on desktop or mobile device. We included the 20 CICRP competency items asking students to rate their self-efficacy in performing each item using a Likert Scale (from 0-10) (0=not at all confident; 10= extremely confident). Links to the survey were included in the courses for the foundational entry course and for the final culminating project course. RESULTS/ANTICIPATED RESULTS: Overall, 54 students took the CICRP during the entry course and 56 during the exit. Cronbach's alpha for each assessment ranged from 0.93 to 0.98. Both the Welch's two-sample t-test and Wilcoxon rank-sum test show very significant differences between the group of students entering the program and leaving the program (p value < 0.001). A significant increase in mean CICRP total score is seen at each experience level between program entry and program exit ($p < 0.001$). A linear regression, adjusting for available covariates, individuals taking the exit course have a mean CICRP total score 92.690 (p value < 0.001) higher than individuals taking the entry course. DISCUSSION/SIGNIFICANCE: Competency indices have been used to measure self-efficacy in translational research scientists, thus the use of CICRP to measure

self-efficacy can be useful in assessing whether our competency-based program is meeting the JTF Competency needs of students.

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Academic Innovation through the interdisciplinary (elective) course Introduction to Clinical and Translational Research (CTR) to increase the number of undergraduate students in Puerto Rico with the knowledge, skills, abilities, and opportunities in CTR

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OBJECTIVES/GOALS: The Title V project team is offering an elective course to teach the historical development of CTR, make a compelling scientific presentation, and use bibliographic databases. In addition, students learn: to write the research question, design a career development plan, protect human subjects in research, and the mentor-mentee relationship. METHODS/STUDY POPULATION: The course includes a variety of educational strategies and activities that allow the student to increase their knowledge and initiate their interest in the field of CTR. Both academic semesters (August to December and January to May) are offered remotely in two-hour synchronous sessions on Fridays from 3:00 p.m. to 5:00 p.m. through videoconferences, in addition to asynchronous activities. Invited expert lecturers and faculty reinforce the course content in each topic they address. In addition, course coordinators assign guided tasks where the students perform the work. Then, they present or send their work to the course coordinators for evaluation. RESULTS/ANTICIPATED RESULTS: The course began in January 2020 and has had six offerings, including one in the current academic semester (August to December 2023). Its first offering was in the semester from January to May, and due to the interest generated in students in August 2022, it is now available in both semesters. From its beginning to the present, the course has included students from the University of Puerto Rico (UPR) Bayamon, Cayey, Humacao, Mayagüez, and Rio Piedras campuses, impacting all geographic areas of Puerto Rico. The course has also represented an opportunity for graduate faculty to teach CTR to undergraduate students. Until 2023, 56 students have enrolled. DISCUSSION/SIGNIFICANCE: Upon completing six-course offerings, the evaluation carried out by the students demonstrates satisfaction with the learning obtained. The knowledge and skills achieved have led them to participate in CTR with the mentoring of collaborating course professors and starting a new professional development opportunity for undergraduate students.

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Impact of Undergraduate Clinical Research Experience: Highlighting the UCLA Clinical and Translational Science Institute Research Associates Program (CTSI-RAP)

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OBJECTIVES/GOALS: CTSI-RAP is a professional development program that provides undergraduate students with clinical research exposure and training. Students support UCLA research faculty by