visits. We built a model to communicate these results to decision makers and demonstrate how program modifications can improve CHW program sustainability and long-term cost savings. METHODS/STUDY POPULATION: This CHW program simulation model (CHWsim) examines program level outcomes of sustainability and costs. CHWsim is populated with individuals in an asthma registry with frequent ED visits. The simulation shows the uptake of the CHW program, and the less frequent use of ED visits based on empirical data from a recent randomized controlled trial (RCT). CHWsim is interactive, allowing for parameter adjustments to programming and robust quantitative evaluation of those changes. We study sustainability using parameters based on number of CHWs, case load, frequency and duration of program. For cost outcomes, we use empirical data from a published return on investment study to demonstrate the cost of CHW programming vs. health care systems savings from reduced ED visits. RESULTS/ANTICIPATED RESULTS: We demonstrate a basic model that successfully simulates a recent RCT ($n = 551$), replicating the primary outcome of reduced ED visits within the Confidence Intervals. The model is validated by reproducing results of other RCTs. Results will also be presented from an in-process expanded model that simulates the intervention in a broader population ($n = 4000$). We test two programmatic changes and demonstrate how these modifications might improve health outcomes (reduced ED visits) that translate into cost savings to the system. 1) In the original trial, we served only one household member; in the model, we treat the full household, serving several individuals at the same time. 2) We also consider the assumption that a short annual visit might sustain the known 12-month health effect across many years. DISCUSSION/SIGNIFICANCE OF IMPACT: CHWsim uses individual level local data and patient characteristics to demonstrate the impact of program efficiencies to improve CHW program sustainability and reduce health care system costs without expensive new RCTs. CHWsim has the potential to improve CHW program delivery and influence funders to provide support.

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Effect of Surface Topography on *In Vitro* and Mechanical Performance of 3D Printed Titanium

Bijan Abar[1], Cambre Kelly, Anh Pham, Nicholas Allen, Helena Barber, Alexander Kelly, Ken Gall, and Samuel Adams
[1]Duke University

OBJECTIVES/GOALS: The goal of the study is to understand how changing the surface roughness of 3D printed Titanium either by processing printed samples or artificially printing rough topography impacts the mechanical and biological properties of the Titanium. METHODS/STUDY POPULATION: Titanium dog bones and discs were printed via laser powder bed fusion. groups were defined as 1. polished, 2.blasted, 4.as built, 4.sprouts and 5.rough sprouts. Roughness was measured with line measurement using a confocal microscope. Tensile testing of dog bones produced stress strain curves. MC3T3 preosteoblast were seeded on discs. Samples were analyzed at 0, 2, and 4 weeks. A cell viability assay and confocal fluorescent microscopy assessed cell growth. Alkaline Phosphatase (ALP) assay and Quantitative Polymerase Chain Reaction (qPCR) examined cell differentiation. Extracellular matrix (ECM) was stained for collagen and calcium. Scanning Electron Microcopy (SEM) was done on sputter coated discs. RESULTS/ANTICIPATED RESULTS: Measured roughness defined by Rz, maximum peak to valley distance of the sample profile ranged from 2.6-65.1 μm. The addition of printed roughness in the sprouts and rough sprouts group significantly diminished ductility resulting in early strain to failure during tensile testing. Cells adhered and proliferated on discs regardless of roughness group. There was no statistical difference in ALP activity, but qPCR showed that rough groups (sprouts and rough sprouts) had diminished Osteocalcin gene expression at week 2 and 4. The ECM in the rough groups was more resistant to repeated washes and was more extensive with SEM. DISCUSSION/SIGNIFICANCE OF IMPACT: Printing roughness diminished mechanical properties without clear benefit to cell growth. Roughness features were on mesoscale, unlike samples in literature on microscale that increase cell activity. Printed topography may aid in implant fixation and not osseous integration as hypothesized. CONFLICT OF INTEREST DESCRIPTION: Dr. Samual Adams, Dr. Ken Gall and Cambre Kelly own stock and/or stock options in restor3d, Inc.

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Enhancing Scientific Rigor, Reproducibility, and Reporting in Translational Science Training and Practice

Roger Vaughan[1], Matthew Covey[1], Michelle Romanick[1], Anthony Carvalloza[1], and Barry S. Coller, MD[1]
[1]Rockefeller University

OBJECTIVES/GOALS: Irreproducible and incompletely reported research lead to misallocated resources, wasted effort in pursing inappropriate avenues of investigation, and loss of public trust. To address this challenge, we employed a Team Science approach to create a multimodal program to support Rigor, Reproducibility, and Reporting in Translational Science. METHODS/STUDY POPULATION: We conducted literature searches to reveal sources of irreproducibility and recommended corrective actions, invited leaders in the field to give lectures on opportunities to support reproducible science, and worked with the Rockefeller team science leadership group to instill an overarching rigor approach, infused into all training efforts. This multifaceted program was labeled R3 (R-cubed) for Enhancing Scientific Rigor, Reproducibility, and Reporting. RESULTS/ANTICIPATED RESULTS: Didactic Courses:

- Introduction to Biostatistics and Critical Thinking – focus on pitfalls in inferential statistics, consequences of poor research, and errors in published research.
- Scientific Writing – teaches methods and procedures in writing to ensure reproducibility. Lecture Series
- Established nine lectures on topics related to R3, including Data Management, Statistical Methods, Genomic Analyses, Data Repositories, Data Sharing, Pharmacy Formulation, and e-lab notebooks. Website
- Creating a comprehensive website as repository for research, methods, programs, updates, and improvements related to R3. KL2 Clinical Scholars Seminars and Navigation
- Scholars participate in seminars and tutorials to discuss opportunities to improve R3 across the research life-course.

DISCUSSION/SIGNIFICANCE OF IMPACT: Striving for research reproducibility takes focused energy, discipline, and vigilance, but the effort is worthwhile as rigorous and reproducible science is the prerequisite for successful translation of great discoveries into improved health. CONFLICT OF INTEREST DESCRIPTION: none

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