# Exposing Pharmacy Residents to Implementation Science

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**Abstract**
The American Society of Health-System Pharmacists (ASHP) aims to improve patient care by innovating pharmacy practices. ASHP-accredited pharmacy residencies require projects that enhance pharmacy practice, focusing on effective project management and quality improvement. However, only a few of these innovations smoothly become part of routine clinical practice. One solution worth exploring involves teaching Implementation Science in residencies. Exposing residents and mentors to Implementation Science offers two main benefits. First, it helps learn from failed interventions by considering alternative thoughts and grasping environmental influences, leading to smarter decisions in future implementations. Second, applying implementation science improves patient care by turning evidence-based practices into practical actions, ensuring better care, consistency across healthcare setups, fewer errors, and tailoring innovative services to specific institutional needs. Exposing pharmacy residents to implementation science pushes forward pharmacy practice by actively applying evidence-based innovations in broader pharmacy or clinical practice.

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In a published essay, Bauer and Kirchner (2020) noted a crucial reality: merely establishing the effectiveness of a clinical innovation does not ensure its seamless integration into routine practice.[1] This dynamic echoes the experiences of numerous pharmacy residents and their mentors, who often devise innovative clinical services or projects, yet only a fraction is seamlessly integrated into clinical practice.

One element of the American Society of Health-System Pharmacists (ASHP) strategic plan is to "advance patient care through pharmacy practice innovation." [2] In compliance with the ASHP accreditation standards, ASHP-accredited pharmacy residencies require the completion of projects that advance pharmacy practice, emphasizing effective project management skills alongside quality improvement initiatives to enhance medication use systems and patient care services.[3]

While success stories make their way into journals, such as the residency edition of the *American Journal of Health-System Pharmacy* and other pharmacy premier journals, significant gaps remain in implementing evidence-based best practices and their subsequent integration into routine practice. It is not uncommon to observe that several of these initiatives lose momentum when the leading pharmacy resident concludes their residency program. Such loss in momentum is attributed to one or combinations of the following two factors - the rapid emergence of competing interventions within the same institution and a lack of resources to maintain or continue the project.[1]

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This experience prompts a fundamental question - How can the adoption and uptake of the multitude of initiatives or quality improvement projects initiated by over a thousand pharmacy residents nationwide be significantly amplified? Although these commendable projects often garner attention at events like the ASHP Mid-year conferences, only a fraction proceeds beyond the presentation phase toward integration into routine practice, hence, impeding the advancement of pharmacy practice and science.

Applaudable approaches used to promote integrating innovative pharmacy services into routine practice have involved monetary funding granted by non-profit organizations like the ASHP Foundation and the acknowledgment and recognition of healthcare systems for innovative practices, among others. One promising option to explore is through education that is geared toward enhancing the teaching of implementation science in residency programs.

Implementation Science is generally defined as "the scientific study of methods and strategies that facilitate the uptake of evidence-based practice and research into regular use by practitioners and policymakers." Implementation Science focuses on utilizing local approaches that leverage existing culture, infrastructure, and practices to increase the uptake of evidence-based interventions.[5-7] This process produces generalizable knowledge that can be adopted in any institution and at any phase of the project process or execution.[5-7] Additionally, the approach strengthens the partnership between stakeholders and clinicians or other healthcare professionals in their commitment to project execution.[5-7] Hence, it enhances the integration of the intervention into clinical practice and, ultimately, its sustainability – which is pivotal to improving health outcomes and equity.

Exposing pharmacy residents and preceptors to Implementation Science principles yields two significant


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benefits. First, it bolsters the capacity to learn from unsuccessful interventions by leveraging counterfactual thoughts and understanding contextual influences - informing better decisions in future implementations.[4] Second, the practical application of implementation science enriches patient care by translating evidence-based practices into feasible implementations, ensuring optimal care, standardization across healthcare settings, error reduction, and tailoring innovative services to the specific needs of the institution.[1,4]

We recognize that venturing into research and quality improvement projects might initially seem daunting for new pharmacy residents and their mentors. However, the utilization of implementation science equips them with an evidence-based framework and implementation strategies, which will enhance their aptness for project development and execution.

One might inquire how this differs from clinical or pharmacy-based research or quality improvement projects. As highlighted by Bauer et al., unlike most clinical research (or pharmacy-based research), which focuses primarily on health or clinical outcomes, implementation science focuses on the context of initiating evidence-based clinical intervention rather than merely "controlling or tolerating that context." [1,4] The field of implementation science diverges from quality improvement as it typically doesn't commence with a specific problem to address, but aims to propagate a particular practice. Quality improvement, on the other hand, usually centers on a distinct issue within a clinic, hospital, or system, without necessarily seeking broader applicable insights.[1,4]

The exposure of pharmacy residents to implementation science paves the way for advancing pharmacy practice science by actively moving evidence-based clinical innovations into broader practice. To start the process of introducing this concept, we advocate offering Continuing Education Programs or Certificate Courses specifically designed to cultivate a thorough grasp of fundamental implementation principles and conceptual frameworks for various stages of project execution (pre-implementation, implementation, and post-implementation), enhancing their understanding of approaches to increase the uptake of evidence-based pharmacy interventions into clinical practice and subsequently sustain them.

To further illuminate the underlying implementation science concepts, let's draw an example from our institution's experience. Let's examine the implementation of an antibiotic stewardship program (ASP) or transition of care (ToC) in a Federally Qualified Health Center where the pharmacist-led ASP and ToC was put into action. In the pre-implementation phase, we identified contextual factors that could serve as barriers or facilitators to ASP or ToC. We applied the Consolidated Framework for Implementation Research (CFIR) - a framework that "systematically guides the assessment of potential barriers and facilitators" to a proposed evidence-based intervention.[8] Based on the identified contextual factors, we selected a series of implementation strategies from the Expert Recommendations for Implementing Change (ERIC) that best suited our needs.[9] During the implementation phase of our project, we used the Reach, Effectiveness, Adoption, Implementation, and Maintenance (RE-AIM) framework to evaluate our process.[10,11] Our implementation is ongoing, and we consistently review our process to determine other strategies or combinations of strategies to improve uptake if the current plan doesn't proceed as expected. As demonstrated, we assert that pharmacists' comprehension of this systematic approach to implementing evidence-based interventions into clinical practice can increase the success rate of its adoption, thereby advancing pharmacy's role in improving health outcomes and equity.

We conclude by drawing from the lessons presented by Bauer et al.'s 2015,[4] the rationale for exposing implementation science is evident in the context of pharmacy-driven projects: With healthcare systems operating in ever-evolving and resource-limited environments, relying on evidence-based strategies becomes crucial to optimize healthcare value and enhance public health outcomes. Implementation science stands as pivotal in bolstering these endeavors.[1,4]

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