

Improvement Cycles in Medical Education: From Quality Improvement to Patient Care and Clinical Research

Julio A. Ramirez, MD¹*

¹Center of Excellence for Research in Infectious Diseases (CERID)

*j.ramirez@louisville.edu

Recommended Citation: Ramirez JA. Improvement cycles in medical education: From quality improvement to patient care and clinical research. Univ Louisville J Respir Infect 2021; 5(1):Article 22.

Improvement cycles are regularly used by performance improvement teams to optimize patients' outcomes by improving the quality of care. One of the best-known cycles for performance improvement in healthcare is the Plan-Do-Study-Act (PDSA) cycle (**Figure 1a**).^[1] During the first phase, Plan, we identify barriers to optimal care, develop a plan to implement new interventions, and identify the outcomes that will be monitored; during the second phase, Do, the new interventions are implemented; during the third phase, Study, we measure the outcomes defined in the planning phase to assess improvement; and during the fourth phase, Act, we make changes to our practice before beginning the next iteration of the cycle to improve implementation.

One basic premise of the PDSA cycle is that improvement can be better achieved by iterative steps that are best visualized as a circular process. Thinking of the activity in a circular framework helps us to understand that during the last phase of the process, we identify new inefficiencies, and we start the PDSA process again to address these. The improvement cycle framework regularly applied to quality of care can be repurposed for the optimization of patient care and clinical research.

Improvement Cycle in Patient Care

Our daily patient care activities are usually represented in four phases under the Subjective, Objective, Assessment, and Plan (SOAP) structure (**Figure 1b**).^[2] The SOAP note is one of the most common ways of sharing information among health care providers. During phase one, Subjective, and phase two, Objective, we accumulate patient information. This information is used in phase three, Assessment, to develop a differential diagnosis and generate a hypothesis that could explain

the patient's illness. In phase four, Plan, we generate a strategy to test the hypothesis by conducting diagnostic tests and develop a treatment plan. In the hospital setting, teaching the use of SOAP notes within the framework of an improvement cycle may facilitate the understanding that the plan that we implement today will be evaluated by the subjective and objective data obtained tomorrow. These data will help us to test our hypothesis during the assessment and to determine whether a change of plan is necessary. Patient care is improved with the appropriate and iterative implementation of the SOAP cycle.

Improvement Cycle in Clinical Research

The process of clinical research can be represented in the following four phases: Plan, Do, Analyze, Publish (PDAP) (**Figure 1c**). During the first phase, Plan, the research idea, study design, and methodology are defined in the study protocol; during the second phase, Do, the study is implemented; during the third phase, Analyze, the statistical and clinical analysis of the data is performed; and during the fourth phase, Publish, the new knowledge gained by the research is disseminated through publication. In the teaching of clinical research, it is important to emphasize that good clinical research will not only generate new knowledge but will also generate important new questions, which will need to be addressed by the next iteration of the PDAP research cycle.

In summary, much as teaching the PDSA cycle facilitates the implementation of quality improvement initiatives, teaching SOAP and PDAP using the framework of improvement cycles may improve our patient care and clinical research activities.

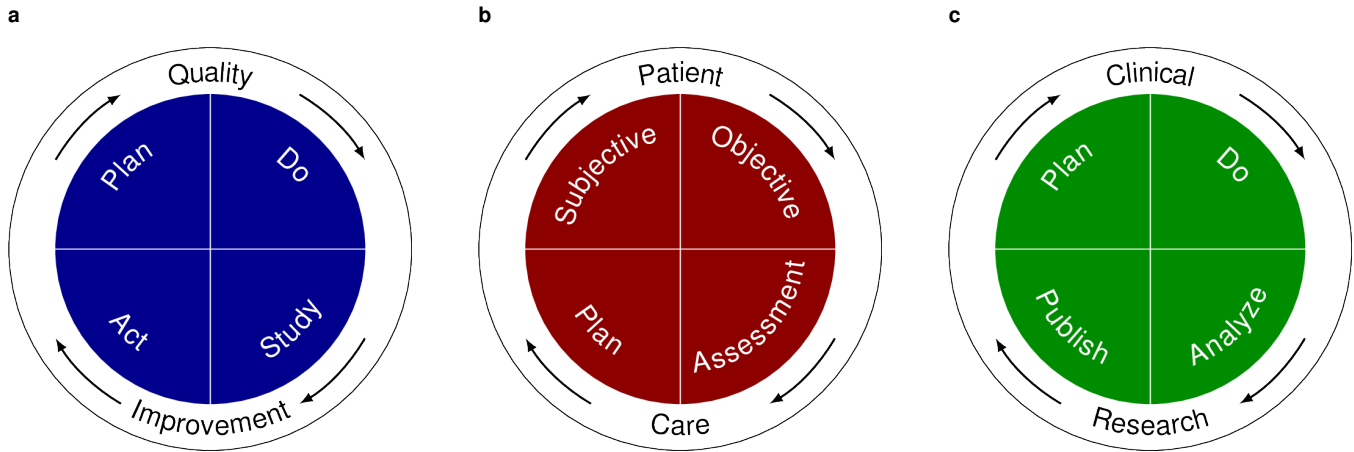


Figure 1. Improvement cycles for (a) quality improvement, (b) patient care, and (c) clinical research.

Received: July 22, 2021

Accepted: August 4, 2021

Published: August 5, 2021

Copyright: © 2021 The author(s). This original article is brought to you for free and open access by ThinkIR: The University of Louisville's Institutional Repository. For more information, please contact thinkir@louisville.edu. This article is

distributed under the terms of the Creative Commons Attribution 4.0 International License (CC BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Funding Source: The author(s) received no specific funding for this work

Conflict of Interest: All authors declared no conflict of interest in relation to the main objective of this work.

References

1. Puri I, Tadi P. Quality Improvement. StatPearls. Treasure Island (FL): StatPearls Publishing, 2021.

2. Podder V, Lew V, Ghassemzadeh S. SOAP Notes. StatPearls. Treasure Island (FL): StatPearls Publishing, 2021.