



Improving Clinician Behaviors and Patient Safety Outcomes Through Standardization of a Pediatric Vaccine Administration Process

Monica Gingell, BSN, RN; Marianne Durham, DNP, RN, CPPS; Susan J. Corbridge, PhD, APRN, FAANP

Practice Problem

"More commonly, errors are caused by faulty systems, processes, and conditions that lead people to make mistakes or fail to prevent them."
(Kohn, Corrigan, & Donaldson, 2000)

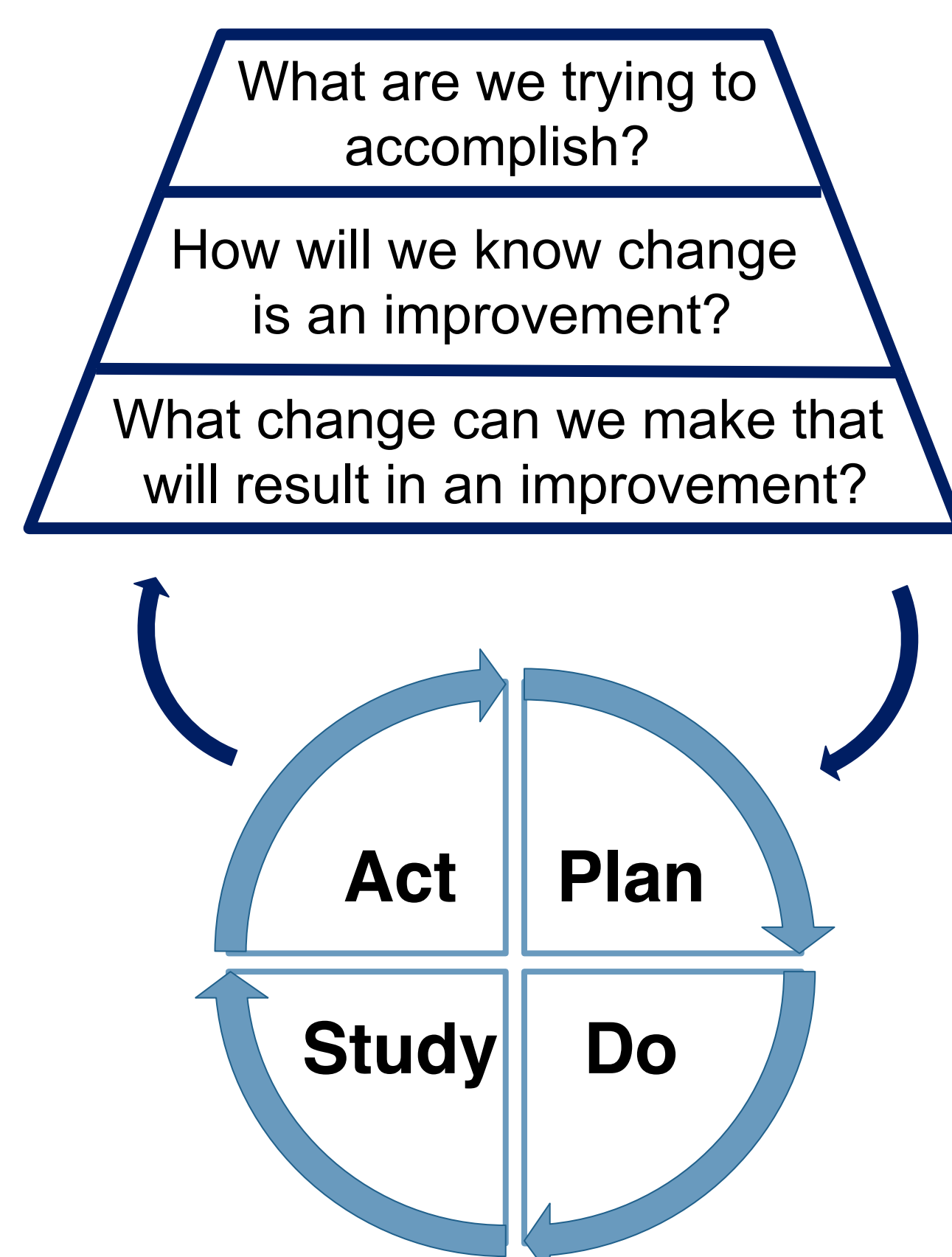
- Project Aim:** simplify and standardize the pediatric vaccine administration process to improve clinician knowledge and safe administration behaviors leading to decreased errors
- Setting:** Federally Qualified Health Center on the west side of Chicago
- Problem:** vaccine-related errors (expired vaccine and wrong vaccine), as a consequence of the complex administration process, may lead to harm such as unknown disease vulnerability and will require costly revaccination

Summary of Supporting Literature

- Immunization errors are predictable based on vaccine- and patient-related human factors (Bundy, Shore, Morlock, & Miller, 2009)
- Systems change is necessary to reduce the incidence of predictable and preventable errors (Bundy, Shore, Morlock, & Miller, 2009)
- The introduction of a standard operating procedure positively affected the compliance to patient safety tasks with effects sustained for 1.5 years (Simons et al., 2014)
- An audit and feedback project yielded improvements in the percentage of compliance across the eight "rights of administration" criteria audited, with statistically significant improvements found in six of the eight (Munn et al., 2014)

Model for Improvement

(Institute for Healthcare Improvement, 2019)



Key References

Bundy, D. G., Shore, A. D., Morlock, L. L., & Miller, M. R. (2009). Pediatric vaccination errors: Application of the "5 Rights" framework to a national error reporting database. *Vaccine*, 27(29), 3890-3896. doi:10.1016/j.vaccine.2009.04.005

Hamborsky, J., Kroger, A., & Wolfe, C. (2015). Chapter 6: Vaccine Administration. In *Epidemiology and Prevention of Vaccine-Preventable Diseases* (13th ed.). Retrieved June 20, 2019, from <https://www.cdc.gov/vaccines/imz/downloads/pdf/13/13ch06-vaccine-admin.pdf>

Institute for Healthcare Improvement (29 March, 2019). How to Improve. Retrieved June 2, 2019, from <http://www.ihi.org/resources/Pages/howtoimprove/default.aspx>

Kohn, L. T., Corrigan, J., & Donaldson, M. S. (2000). *To err is human: Building a safer health system*. Washington, D.C.: National Academy Press.

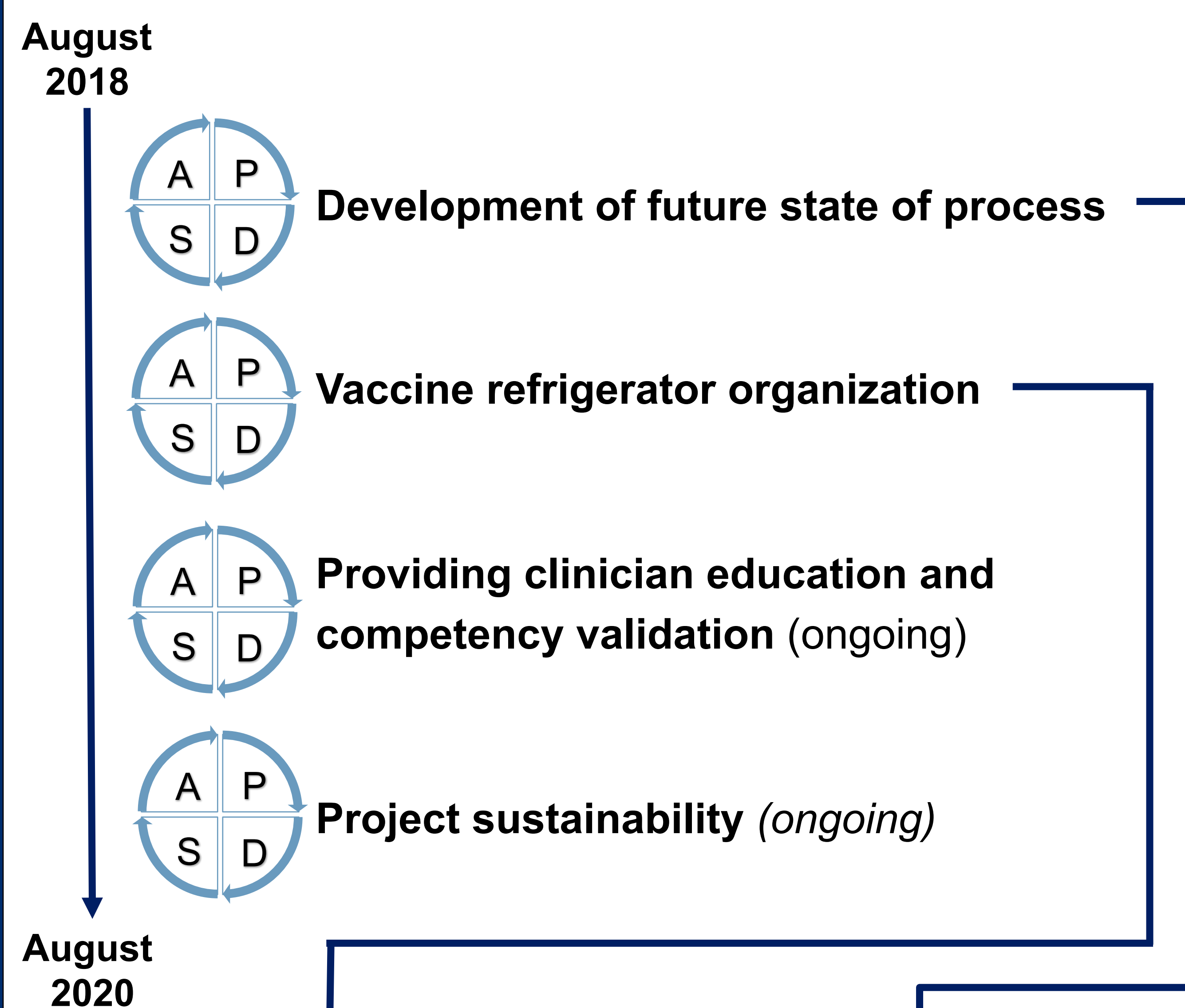
Neuspiel, D. R., & Taylor, M. M. (2013). Reducing the risk of harm from medication errors in children. *Health services insights*, 6, 47-59. doi:10.4137/HSI.S10454

Munn, Z., Scarborough, A., Pearce, S., McArthur, A., Kavanagh, S., Girdler, M., ... McBeth, H. (2015). The implementation of best practice in medication administration across a health network: A multisite evidence-based audit and feedback project. *BMJ Database of Systematic Reviews and Implementation Reports*, 13(8), 338-352. doi:10.1136/bmj-2015-000019

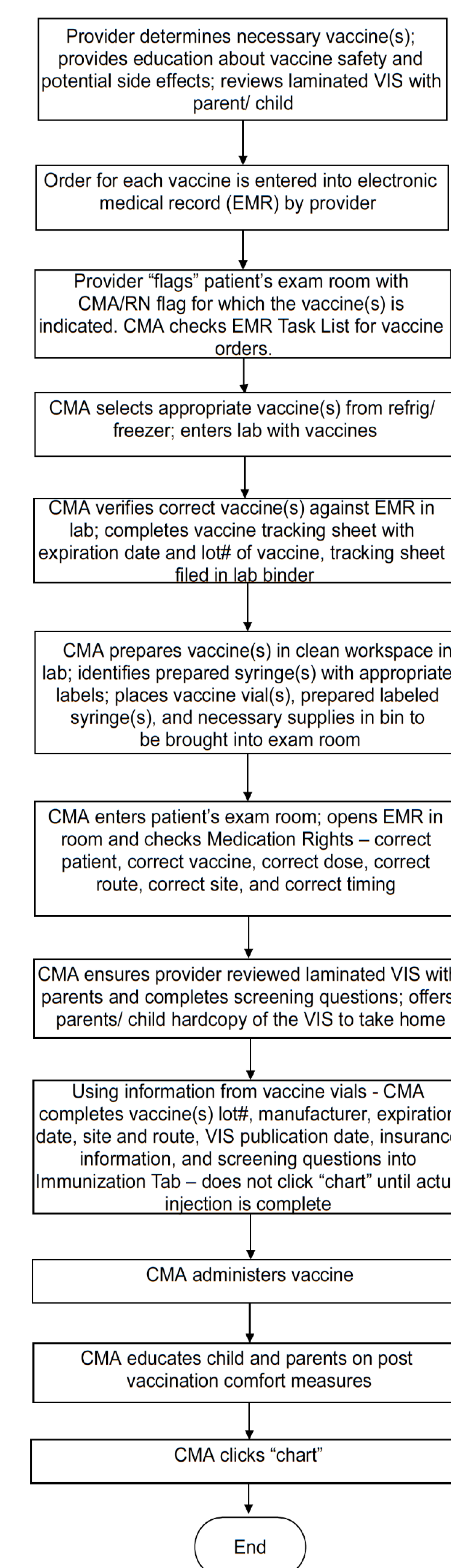
Simons, P. A., Houben, R., Benders, J., Pijls-Johannesma, M., Vandijs, D., Marnette, W., Backes, H., Groothuis, S. (2014). Does compliance to patient safety tasks improve and sustain when radiotherapy treatment processes are standardized? *European Journal of Oncology Nursing*, 18(5), 459-465. doi:10.1016/j.ejon.2014.05.003

U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. (2019, January). *Vaccine Storage and Handling Toolkit*. Retrieved June 20, 2019, from <https://www.cdc.gov/vaccines/hcp/admin/storage/toolkit/storage-handling-toolkit.pdf>

Project Implementation



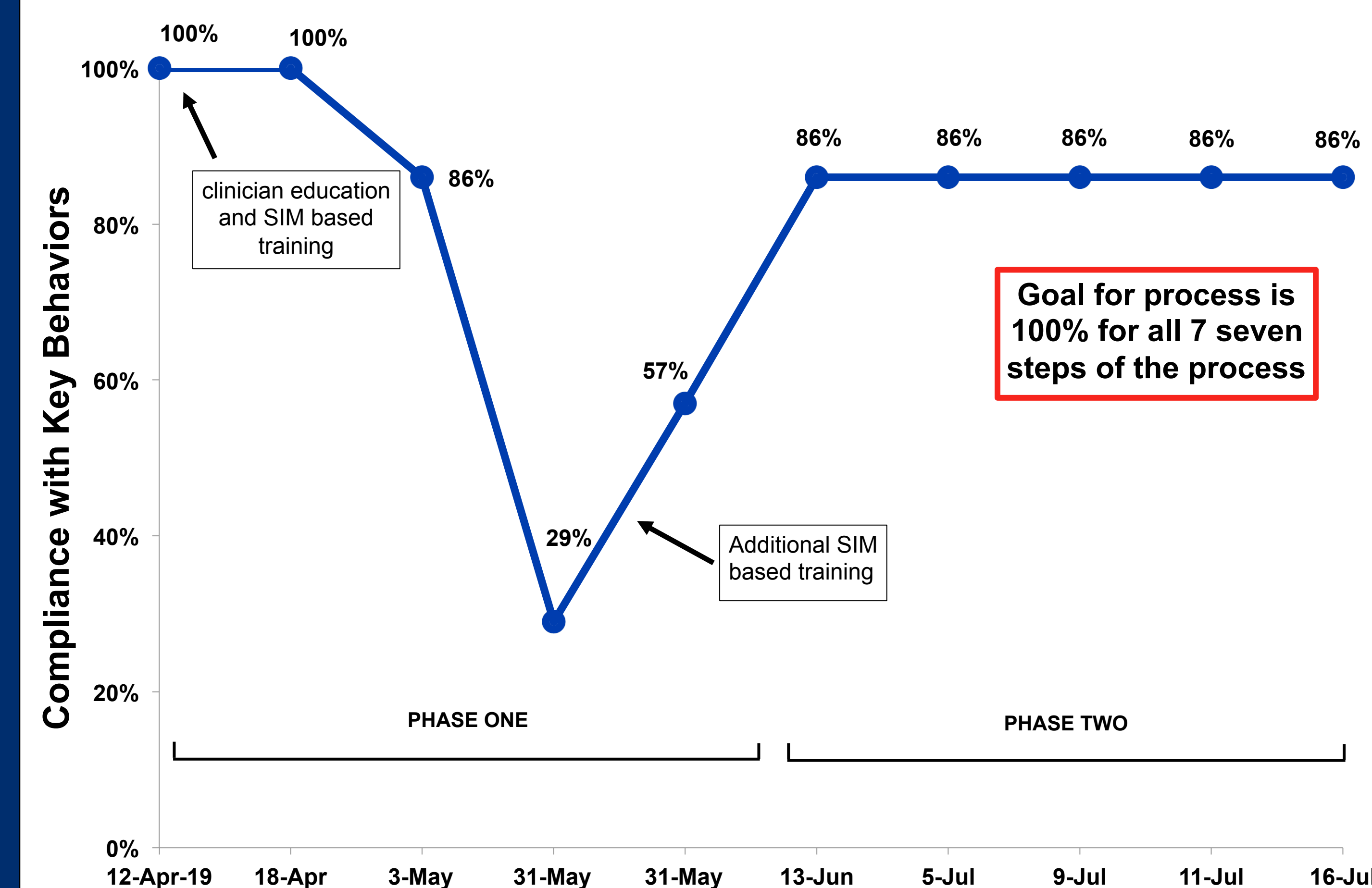
Pediatric Vaccine Administration Process



- Challenges:**
 - Difficulty obtaining organization's vaccine administration policy/procedure
 - Postponed refrigerator delivery
 - Certified medical assistants (CMA) lack of vaccine education and training
 - Low frequency of pediatric immunizations during time of audits
 - Competing CMA priorities and tasks
 - Change in health center leadership

Outcomes

Key Behavior Percent Compliance Audit of Clinician Administration



Vaccine Administration by CMA Audit Number (1 observation each data point)

- Compliant:** clinician administering vaccine performs each of the 7 identified key steps of the process %/7 complete
- Audits conducted** on administering clinician compliance with key measures of process post-implementation
- Zero vaccine-related errors** when key measures are met
- 100% compliant** with most recent City of Chicago Vaccines for Children Program (VFC) audit of vaccine organization and inventory

Clinical Implications for Practice and Next Steps

- Critical step early in process** may increase likelihood of error more than other steps
- Continue process audits** to determine success of this process improvement project
- Perform ongoing clinician education and SIM based training, competency validation, process audits, and real-time feedback** to further increase compliance and promote sustainability
- Train CMAs to audit peers on process and skills competencies** to foster a culture of continuous learning and patient safety
- Refine a reliable and efficient pediatric vaccine administration process** ready to scale up at other sites in organization after process is sustained
- Create an interprofessional team** at the health center to mitigate future issues and implement interventions
- Hand off project to next DNP student** for continuous monitoring and improvement

Acknowledgements

Funding: none to disclose

The authors wish to acknowledge Michelle Martinez, BSN, RN, and all certified medical assistants and nurse practitioners at the health center, for their hard work and dedication to the success of this project.

The authors also wish to acknowledge Ines Didovic, MSN, RN, CNL for her paramount work in the sustainability of this project.