



Improving Effective Asthma Care Through Increased Spirometry Use in a Suburban Primary Care Clinic

Morgan Steele, MSN, NP-C; Khara' Jefferson, DNP, APRN, FNP-C; J.P. Wornock, MD
Frontier Nursing University, Hyden, KY

Background

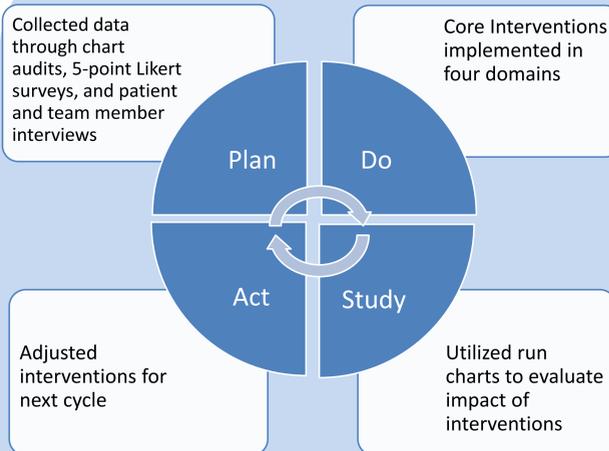
- Asthma is a chronic respiratory condition that affected more than 26 million Americans in 2016.¹
- The United States spends almost \$82 billion dollars on asthma related expenses each year.²
- Asthma should be diagnosed in patients with a history of recurrent respiratory symptoms and reversible airway obstruction ascertained via lung function testing.^{3,4}
- Despite improving the accuracy of asthma diagnosis, less than 25% of patients diagnosed in a primary care environment received spirometry.⁵
- Underutilization of spirometry is a factor in asthma overdiagnosis, estimated between 30% and 53.5% in adult and pediatric populations.^{6,7}
- A suburban primary care clinic desired to improve its effectiveness of care for asthma diagnosis.
- A local chart audit revealed only 20% of asthma patients received effective asthma care, including 10% asthma symptom screening, 15% spirometry, and 40% appropriately timed follow-up. Team confidence in evidence-based asthma care was 63%.

Aim

To increase the percentage of patients five years and older who received effective care for asthma diagnosis to 50% over a 90-day period.

Planned Improvement

Plan-Do-Study-Act (PDSA) Method



Each PDSA cycle lasted two weeks

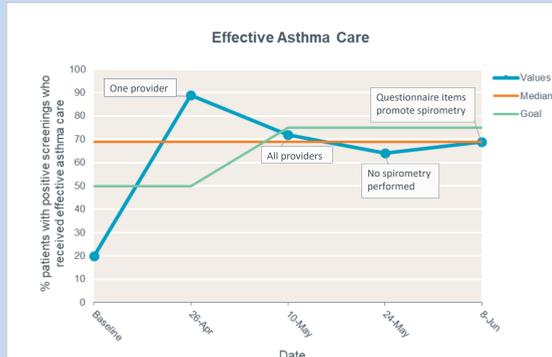
Core Interventions

Screening Asthma screening questionnaire within electronic health record	Patient Engagement <i>Is It Asthma?</i> discussion guide ⁸
Referral Asthma algorithm: spirometry use, follow-up timing, & population health management enrollment	Team Engagement Weekly team meeting

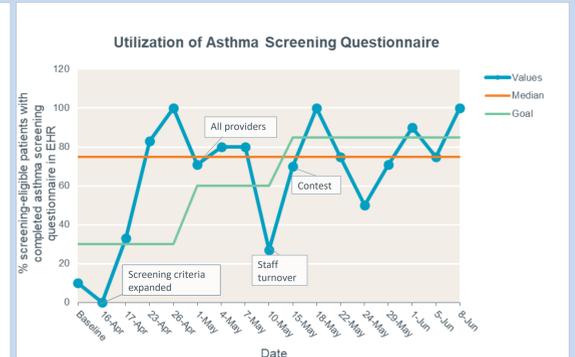
References

- Centers for Disease Control and Prevention. (2018, May). Most recent asthma data. Retrieved July 16, 2018, from https://www.cdc.gov/asthma/most_recent_data.htm
- Nurmagambetov, T., Kuwahara, R., & Garbe, P. (2018). The economic burden of asthma in the United States, 2008-2013. *Annals of the American Thoracic Society*, 15(3), 348-356. 10.1513/AnnalsATS.201703-259OC
- Global Initiative for Asthma. (2018). *Global strategy for asthma management and prevention*. Retrieved from <http://ginasthma.org/2018-gina-report-global-strategy-for-asthma-management-and-prevention/>
- U.S. Department of Health and Human Services, National Institutes of Health, National Heart, Lung, and Blood Institute. (2012). *Asthma care quick reference: Diagnosing and managing asthma* (NIH Publication No. 12-5075). Retrieved from https://www.nhlbi.nih.gov/files/docs/guidelines/asthma_qrg.pdf
- Sokol, K. C., Sharma, G., Lin, Y., & Goldblum, R. M. (2015). Choosing Wisely: Adherence by physicians to recommended use of spirometry in the diagnosis and management of adult asthma. *The American Journal of Medicine*, 128(5), 502-508. 10.1016/j.amjmed.2014.12.006
- Aaron, S. D., Vandemheen, K. L., FitzGerald, J. M., Ainslie, M., Gupta, S., Lemiere, C., . . . Boulet, L. (2017). Reevaluation of diagnosis in adults with physician-diagnosed asthma. *Jama*, 317(3), 269-279. 10.1001/jama.2016.19627
- Looijmans-van, d. A., van Luijn, K., & Verheij, T. (2016). Overdiagnosis of asthma in children in primary care: A retrospective analysis. *The British Journal of General Practice: The Journal of the Royal College of General Practitioners*, 66(644), e152-e157. 10.3399/bjgp16X683965
- Asthma and Allergy Foundation of America. (n.d.). *Is it asthma?* Retrieved from <https://isitasthma.com/>

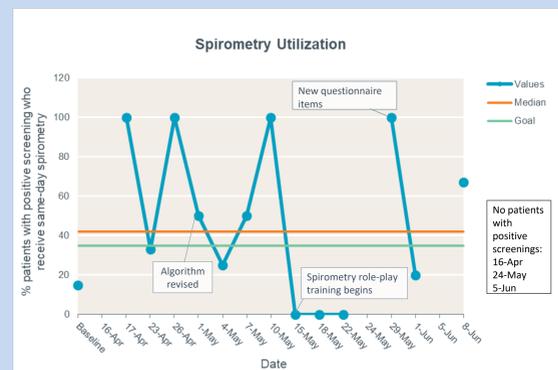
Results



Initiating changes with one provider resulted in 89% effective care during cycle one. Expanding scale to all providers during cycle two caused effective care to decrease to 72%. The nadir of 64% occurred in cycle three when no positively screened patients received spirometry. Screening questionnaire changes to promote spirometry follow through on positively screened patients increased effective care to 69% during the final cycle.



Questionnaire use averaged 17% during the first week because of low patient volume with original screening criteria and questionnaire access issues. Utilization improved after addressing these obstacles and remained above goal until cycle two when staff turnover caused questionnaire use to drop to 27%. The new team members quickly acclimated to the questionnaire; a contest in cycle three promoted sustained use of the tool.



Spirometry use was inconsistent throughout the project. Algorithm changes, confusion about the timing of testing, and decreased team confidence resulted in zero spirometry during cycle three. Asking if spirometry was discussed with the patient and if the patient desired spirometry promoted follow through on positive screenings during cycle four.

Measures

Aim # positive screened patients with discussion guide review, screening questionnaire completed, spirometry performed; if needed, follow-up appointment and asthma population health management enrollment

	Process	Outcome
Screening	# patients screened with asthma questionnaire/# patients qualified to screen	# patients with positive screening/# patients screened that day
Patient Engagement	# patients who complete the discussion guide/# patients receiving guide	# discussion guides reviewed by team member and patient/# patients eligible to receive discussion guides
Referral	# patients receiving spirometry/# patients with positive screen	# patients with appropriately timed follow-up appointment and enrollment in asthma registry/# patients with asthma diagnosis that day
Team Engagement	# staff attending team meeting/# daily staff	Mean score on 5-point Likert scale confidence survey.
Balancing	Total weekly hours DNP student spends in clinic	

Conclusions

- Effective asthma care improved from 20% to 69%.
- Spirometry improved 173%, from 15% to 42%.
- The project resulted in three new asthma diagnoses, 8.8% of positive screenings.
- Increasing utilization of spirometry required team skills training, a screening process to identify asthma symptoms, and a standardized diagnostic pathway that included spirometry.
- Clinic team members designated as asthma champions during the final PDSA cycle supported continued use of the project's interventions after project completion.
- The clinic system intends to spread the asthma screening process and project tools to its other three locations.
- This project did not include further testing for patients who had normal spirometry despite a positive asthma screening. This may have reduced the number of patients who were diagnosed with asthma since spirometry can be normal in patients with asthma when they are asymptomatic.⁵
- While the use of customized tools limits generalizability, other primary care practices could create similar tools using asthma guidelines.^{3,4} Tools should standardize care in a way that includes spirometry as an integral element of the asthma diagnostic process to avoid diagnosing based on symptoms alone.

Lessons Learned

- This project was successful because of supportive leadership and a culture of quality that promoted team participation throughout the project.
- Twelve hour staffing was a barrier to improvement because it interfered with continuity.
- Administering spirometry is technically challenging and required significant team skills training to improve staff confidence and ensure quality results.
- Contrary to the concern that the team would be resistant to a project leader who was not a clinic employee, the team reported they felt the project was successful because it was led by someone who did not have competing duties within the clinic.

Acknowledgements

This project was possible because of the support of the following:
 • Leadership, team members, and patients of PrimeCare Medical Clinic-North Little Rock, AR
 • Khara' Jefferson, DNP, APRN, FNP-C, Frontier Nursing University faculty mentor
 • MAJ Joe Steele, APA-C