

A Quality Improvement Initiative Addressing Provider Prescription of Weight Management Follow-up in Primary Care

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Abstract

Introduction: Few providers routinely comply with the American Academy of Pediatrics recommendations to prescribe weight management follow-up in-between well-child checks for children with obesity/overweight. This quality improvement (QI) project aimed to increase the percentage of patients prescribed weight management follow-up within three months of their well-child check. **Methods:** The project took place in 1 outpatient primary care clinic at a large, free-standing children's hospital from May 2018 to April 2019. We grouped interventions in 4 Plan-Do-Study-Act ramps with the following themes: (1) provider education; (2) electronic health record note changes; (3) discharge order modifications; and (4) provider feedback. The primary outcome was the percent of patients ages 2–18 years with body mass index $\geq 85\%$ that had an order placed to schedule a follow-up weight management appointment in primary care. We monitored attendance rates for scheduled follow-up visits as a balancing measure. **Results:** Mean prescription rates increased from 32% at baseline to 58%, with special cause analysis demonstrating improvement. Of patients prescribed follow-up, 40% returned for a weight management visit, compared to 13% before the QI initiative. The no-show rate was 35%. **Conclusions:** The utilization of QI methodology led to an increase in the percentage of patients appropriately prescribed weight management follow-up and a resultant increase in the number of patients seen for follow-up. The next steps include a re-examination of process failures to improve patient buy-in in follow-up prescriptions. (*Pediatr Qual Saf* 2021;00:e454; doi: 10.1097/pq9.000000000000454; Published online 26 August, 2021.)

INTRODUCTION

Problem Description

Heightened efforts at prevention and intervention are crucial to reversing the childhood obesity epidemic.¹ The American

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Presented at the Pediatric Academic Societies Annual Meeting, Baltimore, MD, April 28, 2019 (Kharofa RY, Chigaga EN, de Klerk JL, Heuthorst C, Van Oss J, Morehous JF. Improving Prescription Rates for Pediatric Primary Care Weight Management Follow-up after a Well Child Check using Quality Improvement Methodology).

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To Cite: Kharofa RY, Siegel RM, Morehous JF. A Quality Improvement Initiative Addressing Provider Prescription of Weight Management Follow-up in Primary Care. *Pediatr Qual Saf* 2021;6:e455.

Received for publication September 30, 2020; Accepted March 12, 2021.

Published online August 26, 2021

DOI: 10.1097/pq9.000000000000454



Academy of Pediatrics (AAP) recommends that primary care providers review body mass index (BMI) at every well-child check (WCC) and engage families in lifestyle modification counseling.² Based on these national recommendations, our pediatric division created an algorithm to guide the assessment and management of overweight and obesity in 2012 (Fig. 1). The prescription of follow-up is an essential component of the treatment plan. It alerts families to the ongoing need to monitor the child's health status, establishes a timepoint for goal setting, allows for a reassessment of anthropometric data, and provides additional time for counseling. Without prescribing follow-up, a provider may not see a child again for another year. Over that time, growth trajectories can accelerate significantly, especially in children six years of age and older, given the physiologic phenomenon of adiposity rebound.³ Thus, the lack of prescription of weight management follow-up at a WCC can be a missed opportunity to intervene.

Available Knowledge

Despite the availability of the Obesity Prevention/Intervention Algorithm (Fig. 1), few primary care providers within our health system comply with recommendations to prescribe weight management follow-up in-between WCCs. A past review of site-specific data revealed that providers appropriately prescribe

follow-up to one-third of patients with an elevated BMI after a routine WCC.⁴ Provider-elicited barriers to pediatric weight management have been studied extensively. Common themes are established throughout the literature. Reported barriers include inadequate training and resources, low self-efficacy in guiding change, and lack of time.⁵⁻¹¹ There are many topics that the AAP recommends covering at WCCs within the typical 15–20 minute appointment, which is challenging at baseline and more difficult if a child has underlying medical or socioeconomic issues.^{5,8,9,11,12} Providers are also deterred by perceived patient reactions to the sensitive topic of weight and the perception that patients/families lack the desire or motivation to make changes.^{5,6,8-11,13} When questioned, parents report that their reluctance centers around concern for their child’s mental health and fear of being blamed for their parenting choices. Parents also indicate that they lack confidence that their provider can effectively manage childhood obesity (ie, lack the necessary knowledge, time, and/or resources).¹⁴

Specific Aim

The specific aim was to increase the percentage of patients, ages 2–18 years, with BMI ≥ 85% who have prescribed weight management follow-up within 3 months of their WCC from 32% to 75% over 6 months.

METHODS

Context

We completed this quality improvement (QI) work at an outpatient, community-based primary care clinic that is part of a large, free-standing children’s hospital. The hospital system uses Epic (Epic Systems Corporation, Verona, Wis.) as the electronic health record (EHR) for scheduling, clinical documentation, and order entry. The clinic has 10 primary care providers (7 physicians; 3 nurse practitioners). The clinic has over 6,000 patients and 14,000 visits annually. The population is approximately 47% white, 37% black, and 15% Hispanic, with 82% of patients insured by Medicaid. Our improvement team consisted of 3 general pediatricians, a nurse, a dietitian, the clinic manager, and one formal QI consultant with tertiary weight management expertise. As the team participated in a QI program through the associated children’s hospital, we also had access to expert consultants.

To prepare for the improvement work, 2 team members observed clinical visits from admission to discharge and created a process map. Process mapping revealed that when a provider prescribed follow-up, they communicated this follow-up to the discharging team member (ie, a nurse or medical assistant) through the EHR. The discharging team member would then either schedule the follow-up immediately (if family amenable and calendar open) or place a recall (per family request or

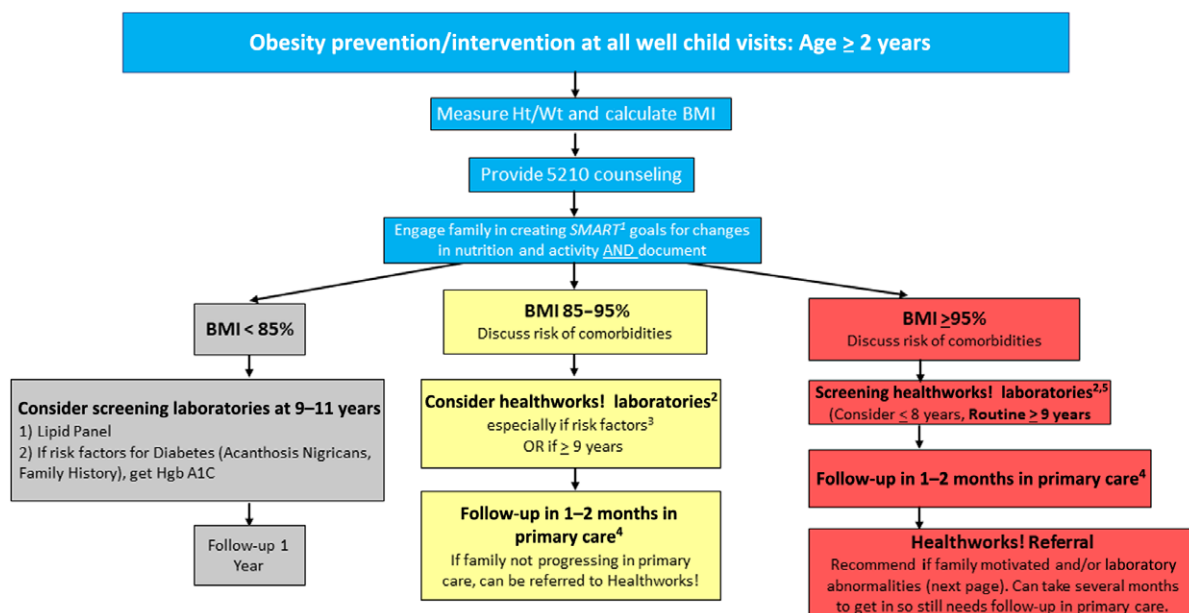


Fig. 1. Obesity Prevention & Intervention Algorithm created to guide screening for elevated BMI, laboratory testing, and follow-up. ¹SMART: Specific, Measurable, Achievable, Relevant/Realistic, Timely. Write SMART goals in note and in patient instructions. ²Healthworks! laboratories: Under Healthworks! in epic. Includes lipid panel, AST/ALT/GGT, TSH (can exclude if no symptoms of thyroid disease), Hgb A1c, insulin, and glucose (can delete the last two if not fasting). ³Risk factors: Acanthosis Nigricans, previous abnormal laboratories, family history of type II DM/HTN/MI < 55/high cholesterol. ⁴Prescribe follow-up and discuss importance of follow-up weight management (avoiding future comorbidities). Maximum recommended f/u = 3 months. ⁵normal laboratories should be repeated every 2 years. For abnormal laboratories, see algorithms on page 2. Repeat abnormal laboratories yearly, unless indicated otherwise on page 2.

appointment slots not yet open). As such, we decided to measure the placement of follow-up recommendations or “the prescription” in the discharge order. A prescription for follow-up for weight management in primary care in 3 months or less was a “success.” No recommendation or prescription for follow-up in the discharge order was a “failure.” We considered the following scenarios as failures as well: (1) if a provider recommended follow-up, but the patient refused so the discharge order did not include the follow-up time point and (2) if a provider recommended weight management follow-up at a period longer than 3 months (contrary to the clinic’s evidence-based algorithm, which recommends follow-up in 1–2 months from the index visit [Fig. 1]). We set the goal for prescriptions at 75%, assuming 1 in 4 families would refuse follow-up or follow-up at a longer time interval. We made this opinion-based estimate as no prior data were available on which to base this calculation.

The improvement team completed a Simplified Failure Mode Effects Analysis (sFMEA)¹⁵ to identify key drivers and potential interventions. We revised key drivers based on provider and consultant feedback. The final key drivers thought to be critical to the prescription of weight management follow-up in primary care, as depicted in Figure 2, are as follows: provider buy-in, provider competency and comfort, standardization of weight management during WCCs, effective provider-patient communication regarding BMI, and provider adherence to evidence-based follow-up guidelines. Although patient variables, including interest, understanding, and readiness to change, were deemed extremely important, they were outside the initiative’s scope. The team only focused on altering provider prescribing behavior. As such, we did not include patient key drivers in the final key driver diagram.

Interventions

We executed interventions using Plan-Do-Study-Act (PDSA) cycles.¹⁵

1. Provider education: At baseline, providers could access the obesity prevention and intervention algorithm (Fig. 1) electronically on the hospital’s employee website, where it was located with a wide array of other resources for general pediatricians. Few providers reported actively using it to guide management. To inform providers of national and division-specific guidelines, we delivered a presentation to the site-specific medical providers at a monthly meeting. Eight of the 10 clinic providers were present. The 2 absent providers received the presentation on an alternate day during the same week. The presentation included the prevalence of childhood overweight and obesity, associated comorbidities, AAP evidence-based recommendations on prevention and intervention during WCCs, tactfully approaching BMI conversation with families, and data on the low baseline prescription rates.

We also reviewed some basic tenets of motivational interviewing to help guide plan creation, focusing on gauging confidence for specific changes and re-working plans when confidence was less than 7 (scale 0–10). The presentation concluded with a discussion of the Obesity Prevention & Intervention Algorithm (Fig. 1), the division-specific algorithm for prescribing follow-up, and what laboratories to order for a child based on BMI category and risk factors. The algorithm was subsequently printed in color and hung-up at each desk in the provider work area to serve as a reminder and provide immediate access.

During the initial education session, we sought feedback on the clarity and usefulness of the algorithm. Providers voiced that further instructions on how to interpret and manage screening laboratories would be helpful. After consultation with specialists in Endocrinology, Cardiology, and Gastroenterology, we created a second page to the algorithm, guiding interpretation and management for each of the recommended obesity-screening laboratories (not shown).

2. EHR note changes: Before the QI initiative, the WCC note templates included discharge instructions so that providers could document follow-up recommendations within the clinical chart. We modified the plan section of note templates to include a dropdown choice specifically for weight management follow-up in primary care. We embedded a second dropdown menu within the weight management follow-up choice to allow providers to easily indicate the time interval for follow-up (1, 2, 3 months or an asterisk to enter free text).

We also created a new note template for the follow-up weight management visit. Although what occurred at the follow-up visit was outside the scope of this initiative, we identified provider concern about lack of competency/comfort with providing follow-up care as a barrier to prescribing follow-up. Thus, to increase provider comfort and increase prescription rates for follow-up, the improvement team designed a new note template prompting the appropriate history, ROS, physical examination, and guiding the assessment and plan for a follow-up weight management visit. Additionally, the plan section of the note included an area for documenting the family’s confidence in achieving each specific goal. The team sought verbal feedback on ease of use and the template’s ability to increase provider comfort with weight management care. The team revised the template based on feedback.

3. Modification of discharge order: A discharge order already existed within the order set for a WCC. The provider could indicate their recommendation for follow-up by selecting a dropdown menu choice (eg, “follow-up in 1 year for next WCC”) or by using free text. We added an option for the

Pediatric primary care weight management prescription: Key driver diagram (KDD)

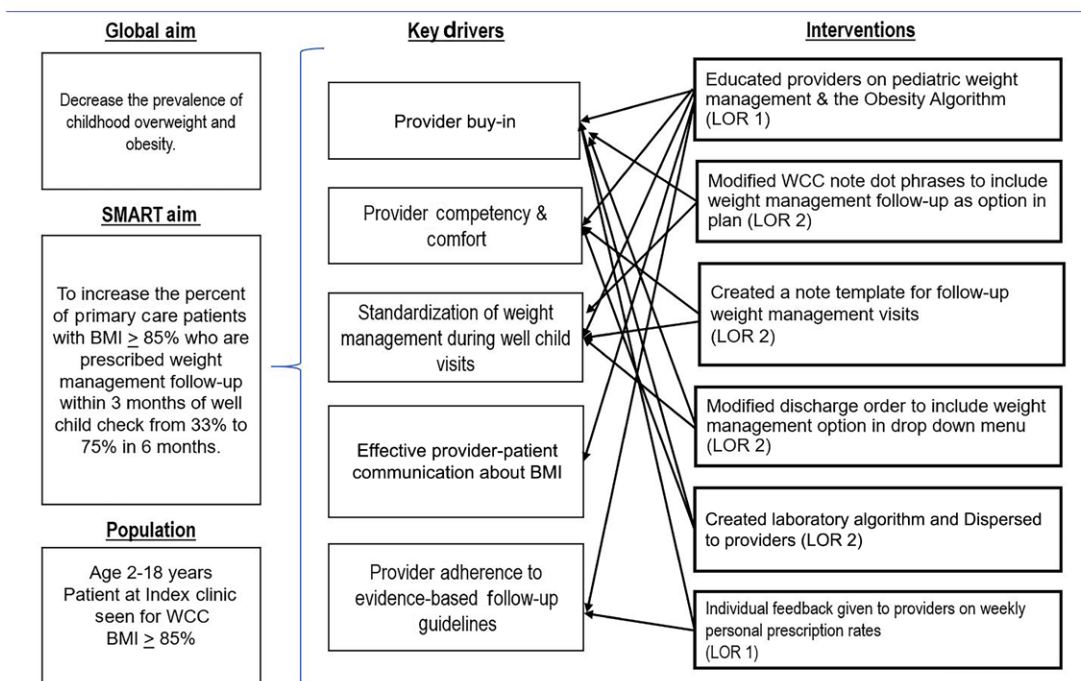


Fig. 2. Key driver diagram. James M. Anderson Center for Health Systems Excellence. LOR#, level of reliability number.

patient to return for a weight management visit as the menu choice directly below returning for the next WCC. This phrase served both as a reminder to the provider and a way to enter orders more efficiently. Similar to the note changes, the instructions included recommended time intervals or a free-text choice.

4. Giving providers feedback: We started sending out monthly provider updates about the group’s success during month one. In the third month, providers also started receiving individual updates regarding their performance compared to the larger group.

Study of the Interventions

To establish a baseline for weight management prescriptions, we looked at data for 6 weeks from the end of May 2018 to the beginning of July 2018. The 6-month intervention period began in July 2018 and ended in December 2018. We monitored data for an additional 3 months after PDSA cycles ended (through March 2019) to monitor sustainability. The institutional review board associated with the clinic reviewed the study and decided it was not human subjects research.

Measures

The primary outcome measure was the percentage of patients, ages 2–18 years old, with BMI ≥ 85%, seen for a WCC that received a prescription for follow-up for weight management. The primary author (R.Y.K.) reviewed a

weekly, automated report from the EHR for all children meeting inclusion criteria. The report included patient name, date of birth, contact date, provider name, BMI percentile, and the text within the discharge order. The number of patients with BMI ≥ 85% that had an order to schedule a follow-up appointment within 3 months of the WCC was the numerator. The denominator was the total patients meeting inclusion criteria for the week.

We monitored attendance rates for scheduled follow-up visits as a balancing measure given the concern that increased prescriptions for weight management follow-up could lead to high no-show rates. We collected data by performing a secondary EHR extraction to look at scheduled visits and completed visits for patients prescribed follow-up for weight management from July 2018 to December 2018. We monitored follow-up appointments through April 2019 to capture all patients seen for follow-up up to 4 months from their index WCC visit.

Analysis

We plotted the outcome measure weekly on an annotated control chart (p-chart). We counted no prescription or a prescription with a follow-up time point longer than 3 months as failures, consistent with the clinic’s Obesity Prevention & Intervention Algorithm. We analyzed data using standard statistical process control methods. We used special cause analysis to identify a change in performance within the system, with 8 or more consecutive points above or below the centerline used to cue a midline shift in the control chart.¹⁵

We dichotomized attendance rates for scheduled follow-up visits as yes or no, based on the patient returning in less than 4 months of the index visit. We analyzed data using descriptive statistics.

RESULTS

Outcome Measure

There were 923 patients with a BMI \geq 85% seen for WCCs between July 15, 2018, and March 14, 2019. Through this QI initiative, the improvement team increased the percentage of discharge orders that included a prescription for weight management from 32% at baseline to 58% in the first month of PDSA cycle implementation (Fig. 3). Provider education on the clinic algorithm had a significant initial impact. The improvement was sustained for 8 months using additional PDSA cycles. Analysis of individual data during the QI initiative showed that provider compliance ranged from 0% to 100%, with 20% of providers falling below 50% for appropriately prescribing weight management follow-up (compared to 80% of providers at baseline).

Verbal qualitative comments from providers during monthly provider meetings regarding the most impactful PDSAs corroborated that the education and EHR changes provided sustainability to the initiative. Providers

reported that the education motivated them to increase their counseling frequency, leading to increased confidence, positive patient experiences, and repeated application. Additionally, all 10 providers reported the discharge order changes as extremely helpful. One provider reported: “There are just so many issues being addressed during the WCC. Having weight management follow-up as a drop-down option reminds me to communicate this with nursing. Before, I may have recommended it to the family but forgot to communicate it to the rest of the team.” Similarly, providers reported liking the new template for the follow-up visit note.

Although this QI initiative did not have a specific aim associated with the ordering of obesity-screening laboratories, the QI team quickly deciphered that provider buy-in, a key driver, was tied to an interest in learning how to manage laboratories with specific questions on which laboratories required referral. We created a laboratory ordering and referral algorithm in consultation with specialists, and providers unanimously (10/10) reported the algorithm was helpful during monthly meetings, improving buy-in based on positive anecdotal comments.

Balancing Measure

Forty percent of patients returned for a weight management visit within 3 months, compared to the historical

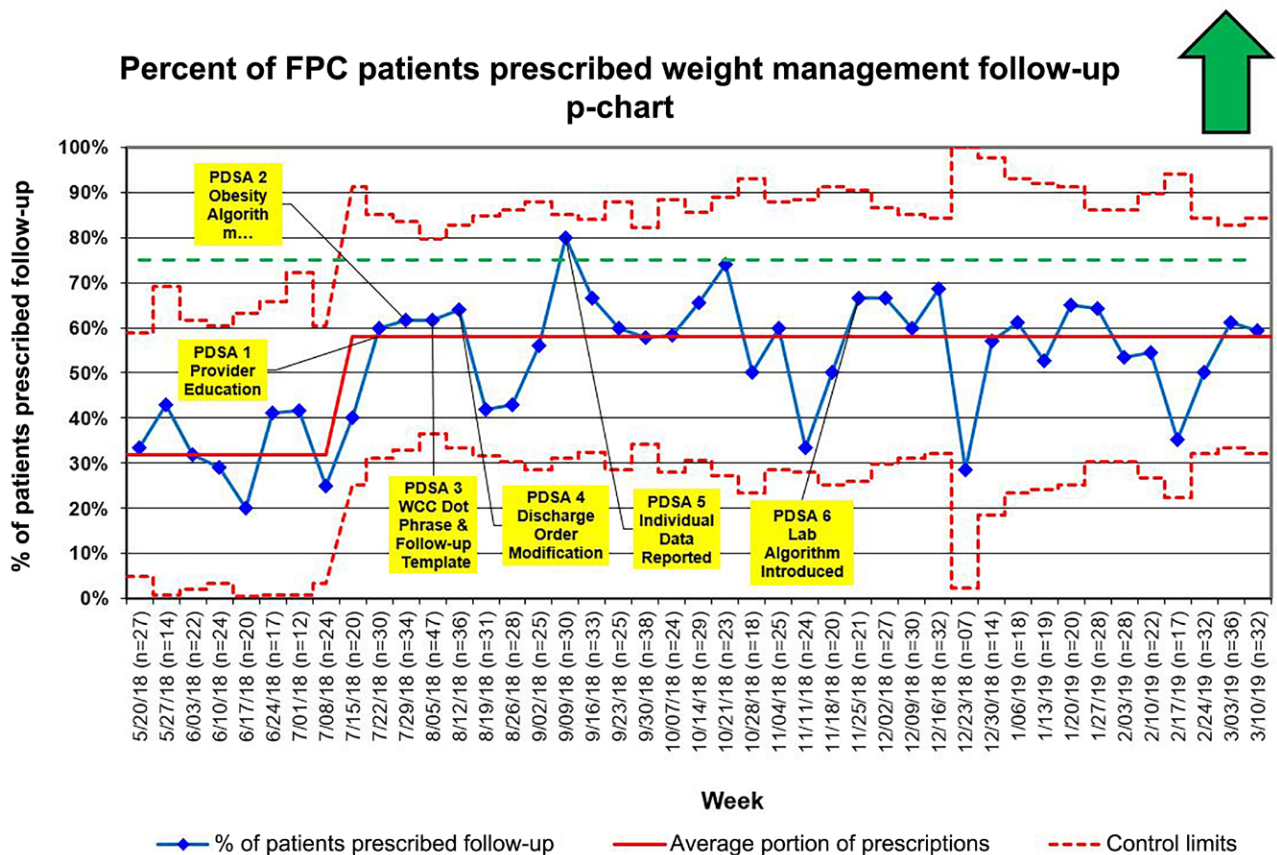


Fig. 3. Percent of patients prescribed follow-up for weight management in primary care after a routine well-child check.

rate of 13% based on past clinic data. No-show rates for weight management were 35%, compared to 52% before this QI initiative. The overall no-show rate for the clinic is 25% (for all appointment types).

DISCUSSION

To our knowledge, this is the first QI initiative to address provider prescription of follow-up for weight management in the primary care setting. Our implementation efforts support that providers can change their practice and improve pediatric weight management during WCCs. Using QI methodology, the improvement team increased provider prescriptions of follow-up for weight management in primary care by 26%, a sustainable change 8 months later. Provider education on national and local treatment guidelines was an impactful intervention. Providers reported increased confidence in their skills following the education and repeated application. This finding is consistent with prior literature looking at referral to tertiary care for weight management (as opposed to follow-up in primary care), showing that provider education can improve referral rates.⁶ Efforts at not only educating practicing providers but also improving the education of trainees are pertinent. Creating a provider workforce that understands the effectiveness of current management protocols^{16,17} and feels comfortable providing pediatric weight management care are necessary steps to curtail the epidemic. Education in itself is only a level of reliability of 1 (10%–20% failure rate); however, process standardization, the aim of algorithm creation and spread, has a level of reliability of 2 (5% failure rate), leading to a more consistent process and improved outcomes.¹⁵

Provider comfort with obesity-screening laboratories increased, which was an interesting and unforeseen consequence of this initiative. Despite being a recommended part of care for children with overweight and obesity,² providers infrequently order laboratories⁶ and have identified laboratory testing as an area where additional guidance would be helpful.⁵ As laboratory ordering was not part of this initiative's specific aim, we did not track laboratory orders during this project. A future retrospective analysis to look at changes in ordering patterns before and after this initiative will be necessary to determine if provider education and algorithm support lead to improved metabolic screening. Similarly, it would be beneficial to look at whether providers more comfortable with comorbidity management are more likely to prescribe weight management follow-up as well due to a sense of increased overall competence with the content area.

Although education was an essential aspect of this QI initiative based on the control chart (Fig. 3), additional interventions also played a role in sustaining the improvement for 8 months. Two of the PDSA ramps involved enhancements to the EHR. Qualitative data from providers supported that the amendment of discharge orders to include follow-up options within the dropdown menu

allowed the change to be sustainable. The reminder for follow-up is a constant within the discharge. The provider must select a choice or delete the smart phrase before signing the order. As choosing a discharge order was already a well-established part of the care delivery system, the team built on this pre-existing process step. Additionally, the prewritten text is favorable to providers because it decreases the time spent on EHR-related work. Implementation efforts that can help decrease the charting burden while enhancing clinical care are crucial to building a more efficient system.

Limitations

Some limitations hindered our initiative. Our outcome measure was reliant on patient acceptance and not a pure measure of provider prescription. If a patient declined follow-up, the provider would not enter a prescription in the discharge order. The provider could document refusal in the patient note instead; however, we only reviewed discharge orders for this initiative because we could abstract data from the discharge orders electronically. We were unable to abstract free text from the patient note, and thus monitoring provider notes was not sustainable long-term. We also counted follow-up recommendations as failures if prescribed at an interval longer than 3 months. We based this decision on past data showing that patients do not return to the clinic if asked to return at 4 months or longer.⁴ To account for these scenarios, the improvement team set the goal of prescription at 75%. Although prescription rates increased significantly to 58%, we did not meet the goal. Additional analysis in the future will need to focus on the remaining 42% to identify what portion of these failures are due to lack of appropriate prescription by the provider versus a family's lack of interest and/or buy-in in following up. Qualitative analysis would allow for further investigation into barriers for both providers and patients. Long-term anthropometric data would also help show whether using the algorithm and associated management protocols leads to effective weight management (ie, improved anthropometric and metabolic outcomes). Last, as the improvement initiative took place at a single clinic, the results may not be generalizable. The improvement team spread the implementation efforts to 2 other clinics within the hospital system in March 2019. Further analysis is needed to determine the success of implementation at these alternate sites.

CONCLUSIONS

The improvement team successfully used QI methodology to increase provider prescription rates for follow-up weight management rapidly. We demonstrated sustained improvement even after active improvement efforts ended. The next steps will focus on patient acceptance of and adherence to follow-up recommendations for weight management in primary care.

DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article.

ACKNOWLEDGMENTS

We want to extend special thanks to Esineya N. Chigaga, Jennifer L. de Klerk, Christine Heuthorst, and Jennifer Van Oss for their assistance with their quality improvement initiative.

REFERENCES

- Daniels SR, Hassink SG; Committee on Nutrition. The role of the pediatrician in primary prevention of obesity. *Pediatrics*. 2015;136:e275–e292.
- Barlow SE; Expert Committee. Expert committee recommendations regarding the prevention, assessment, and treatment of child and adolescent overweight and obesity: summary report. *Pediatrics*. 2007;120 Suppl 4:S164–S192.
- Rolland-Cachera MF, Deheeger M, Bellisle F, et al. Adiposity rebound in children: a simple indicator for predicting obesity. *Am J Clin Nutr*. 1984;39:129–135.
- Kharofa RY, Khalsa AS, Zeller MH, et al. Giving “prescriptions” for paediatric weight management follow-up in primary care. *Clin Obes*. 2021;e12448.
- Rhee KE, Kessl S, Lindback S, et al. Provider views on childhood obesity management in primary care settings: a mixed methods analysis. *BMC Health Serv Res*. 2018;18:55.
- Busch AM, Hubka A, Lynch BA. Primary care provider knowledge and practice patterns regarding childhood obesity. *J Pediatr Health Care*. 2018;32:557–563.
- Hill SG, Phan TT, Datto GA, et al. Integrating childhood obesity resources into the patient-centered medical home: provider perspectives in the United States. *J Child Health Care*. 2019;23:63–78.
- Findholt NE, Davis MM, Michael YL. Perceived barriers, resources, and training needs of rural primary care providers relevant to the management of childhood obesity. *J Rural Health*. 2013;29 Suppl 1:s17–s24.
- Shreve M, Scott A, Vowell Johnson K. Adequately addressing pediatric obesity: challenges faced by primary care providers. *South Med J*. 2017;110:486–490.
- Thornberry TS Jr, Bodziony VR, Gross DA. Provider practice and perceptions of pediatric obesity in Appalachian Kentucky. *South Med J*. 2019;112:553–559.
- Bradbury D, Chisholm A, Watson PM, et al. Barriers and facilitators to health care professionals discussing child weight with parents: a meta-synthesis of qualitative studies. *Br J Health Psychol*. 2018;23:701–722.
- Butt F, Farooq Butt A, Alam F, et al. Perception and management of obesity among Pakistani doctors. *Cureus*. 2019;11:e4156.
- Schalkwijk AAH, Nijpels G, Bot SDM, et al. Health care providers’ perceived barriers to and need for the implementation of a national integrated health care standard on childhood obesity in the Netherlands—a mixed methods approach. *BMC Health Serv Res*. 2016;16:83.
- Turner KM, Salisbury C, Shield JP. Parents’ views and experiences of childhood obesity management in primary care: a qualitative study. *Fam Pract*. 2012;29:476–481.
- Langley GL MR, Nolan KM, Nolan TW, Norman CL, Provost LP. *The Improvement Guide: A Practical Approach to Enhancing Organizational Performance*. 2nd ed. Jossey-Bass Publishers; 2009.
- Kumar S, King EC, Christison AL, et al; POWER Work Group. Health outcomes of youth in clinical pediatric weight management programs in POWER. *J Pediatr*. 2019;208:57–65.e4.
- Whitlock EP, O’Conner EA, Williams SB, et al. Effectiveness of primary care interventions for weight management in children and adolescents: an updated, targeted systematic review for the USPSTF. Agency for Healthcare Research and Quality (US). 2010; Report No.: 10-05144-EF-1.