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Increasing Vaccination Rates of Children up to 24 months old at PMG Milwaukie Family Medicine

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Quality Improvement Project - Background

Introduction

- Life expectancy during the 20th century has increased largely due to improvements in childhood survival, mainly from reducing mortality due to preventable infectious diseases. Yet these diseases remain a major cause of morbidity and mortality despite steady increases in pediatric immunization rates.
- For each birth cohort vaccinated with the routine immunization:
 - ~14 million cases of diseases are prevented, and almost \$10 billion in direct health care costs are reduced.¹
 - Per the CDC, ~ 42,000 adults and 300 children in the United States die each year from vaccine-preventable diseases.
- Our clinic, following national and local trends, falls short of Center for Disease Control (CDC) Healthy People 2020 benchmark goals of a 80% pediatric vaccination rate.
- Our goal is to increase our rates of pediatric vaccinations in children up to 24 months of age in our residency clinic to the CDC benchmark.

Background Research and Literature review

- We used a combination of literature databases including Ovid, Cochrane Reviews, and mainstream health sources such as the CDC and Healthy People 2020 to find published research on various strategies to increase pediatric vaccination rates in a primary care setting.
 - Considerable variation in vaccination rates occurs at a state level, namely in states that allow for philosophical or personal belief exemptions to vaccines. As of 2016, there were only three states that prohibited this and only allowed medical exemptions. In May 2019, Oregon became the fourth state. Thus, our background research focused on reviews that identified strategies aimed at local variation, namely the parents, providers, and clinics.
- Frew et al. conducted a large systematic review, evaluating 66 studies, 39 of which were randomized controlled trials (RCTs) that looked at interventions for both parents and providers. Multiple studies in this review have documented successful strategies geared towards parents by implementing a simple reminder/recall system that is endorsed by the American Academy of Pediatrics.
 - Reminder system improved childhood vaccination rates in primary care settings (RR 1.22, 95% CI).²
- A quality improvement project by a community family medicine residency program in Utah demonstrated an increase in their clinic pediatric vaccination rates from 66% to 91% over a 9-month period by targeting provider-MA teams pre-clinic planning. During a pre-clinic meeting, the immunization records of every pediatric patient on that scheduled clinic-day was presented and reviewed with every clinic provider to improve recognition of vaccination need.⁶
- A Cochrane systematic review in 2017 looked at provider communication with parents and explored their perceptions. In general, "parents wanted more information than they were getting" and in most instances, a lack of balanced and unbiased information led to worry and regret in terms of parents' vaccination decision.³

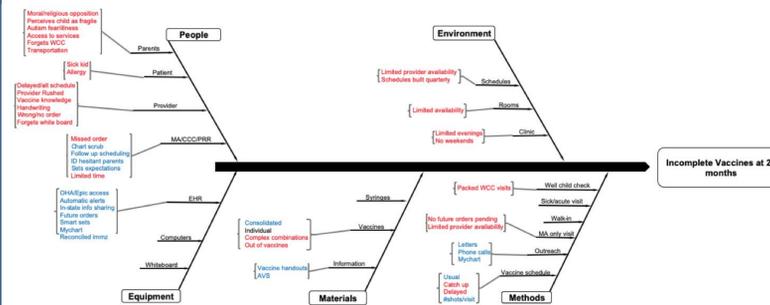
Problem statement

- The 2019 vaccination benchmark set by the Oregon Health Authority (OHA) for up-to-date vaccinations of 24 month old children is 82%. At the beginning of our study period (June 2019) the Providence Milwaukie Family Medicine Clinic vaccination rate of 60% for the on-time completed vaccination of 24 month-old patients. Our primary data is collected from our EPIC electronic health record (EHR). The numerator is our number of children up to 24 months old who received the recommended CDC vaccines and the denominator is based on all patients seen in the last 2 years by a Providence Milwaukie provider.

Project Aim Statement

- The aim of our quality improvement project is to achieve a greater than 81.9% vaccination rate in our clinic based on a 90th percentile 2019 benchmark set by Oregon Health Authority National Medicaid by March 1st, 2020.

Understanding the Problem



Root Cause Analysis

- A collaborative review of the Milwaukie childhood immunization workflow was completed for well child checks (WCC), acute visits, and MA visits. Our interdisciplinary team found opportunities for improvement at multiple levels of the clinic utilizing the Swim Lane and Ishikawa diagrams. The review identified areas of improvement in parent or guardian education, missed WCC and MA appointments, recall/reminder outreach, provider-to-MA communication, improving EMR vaccine accuracy, and provider vaccination knowledge and counseling.
- We identified 3 mechanisms for vaccinating children under current clinic processes: WCC, medical assistant (MA) vaccination visits and contemporaneous vaccination with acute care pediatric visits. Using a multidisciplinary team of MAs, Clinical Care Coordinators (CCCs), and our Nursing Quality Supervisor (NQS), we mapped our process for vaccination in each visit type in swim lane diagrams.

Methods

PDSA 1 – Standardize Work flow for Vaccine Reconciliation

- Plan/Do:** Clinic wide intervention - Medical assistants reconcile immunizations from immunization registry to ensure accurate immunization record in EPIC before appointment
- Study/Act:** Analysed if our immunization rates were improved monthly through EPIC data record (HealthyPlanet). Immunization rates increased from 60% to 61% with reconciliation alone. The change was insignificant and reconciliation was returned to previous clinic work flows.

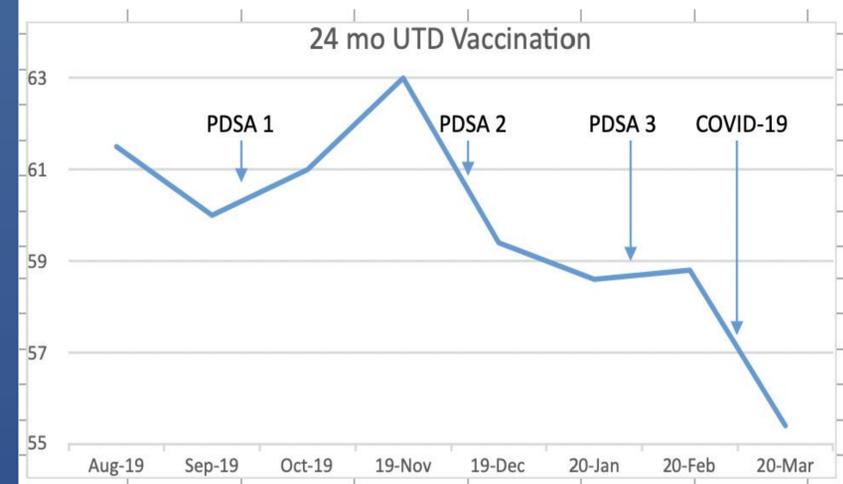
PDSA 2 – Sending Personal Reminder Letters to Patients and Overall Improving our Vaccine Recall/Reminder System

- Plan/Do:** By improving our recall/reminder system to parents with children due for well child checks, there will be more visits for vaccines scheduled (MA or WCC). By utilizing this recall system once a quarter, in time this should improve our outcome measure. We ran an initial report on Epic for children who are due for WCC under 2 years of age, sent out reminder letters by team and give 1 month time for parents to schedule appointments.
- Study/Act:** Ran initial report and compared to report at the end of the 2 month time frame. In all patients under age 2, the number due for a WCC remained constant at 65 in December and 66 in February. However, in 18-24 month olds, patients due for a WCC decreased from 41 to 35(14.6% reduction) over the same time frame. Patients incoming and exiting the age criteria were not controlled for and may confound the result.

PDSA 3 – Minimizing provider variation for vaccines given at the 12-18 month WCC

- Plan/Do:** It reviewing our data, it is clear the the overwhelming majority of children that are not UTD on vaccines fall behind between 12 and 18 months. We created survey for providers to understand variation of vaccination schedule practices given at 12, 15, and 18 month WCC. Review results/create standardized vaccine schedule to propose to all providers. Talk to clinic leadership about proposed schedule/plan, get ideas for revisions. By minimizing provider variation in vaccine administration at the 12-18 month WCC, we hope to increase overall vaccination rates in our target population, in particular by improving on-time vaccinations.
- Study/Act:** Results indicated that 40% of respondents preferred a maximum of 4 vaccines per visit while and additional 40% preferred giving all indicated vaccines no matter the number. The largest identified reasons for vaccine delays were febrile illness and patient preference. To maximize provider involvement and encourage patient participation, a schedule allowing for maximum of 4 vaccines at a visit was created that would adhere to CDC recommended guidelines. 12 mo: MMR, Varicella, HepA, Prevnar 13. 15 mo: Pentacel. Smart order sets were created for 12 month and 15 month WCC visits to standardize vaccinations across the clinic.

Data



Discussion

- Conclusions:**
 - Providence Milwaukie Family Medicine has consistently under-performed in vaccinating children up to 24 months old according to EPIC Healthy Planet data with an average rate of 60-65% from October 2018 to May 2019. We had not been meeting the 2019 OHA 90th percentile benchmark of 81.9% 24 month vaccination rates.
 - Potential Factors Concluded from our QI Project:
 - Initially it was noted that there were multiple ways that our vaccination rates were tracked. However we found that consolidating those systems did not make a significant difference in our clinic vaccination rates. Therefore, we believe that using the system EPIC has in place to track patients who are in need of vaccines was sufficient and did not change our outcome data significantly.
 - We did not have a reliable vaccine schedule reminder system and we did see improvement in our vaccination rates when a personal vaccine reminder letter was sent to patient's families.
 - We also noted variation among providers in vaccination schedules (still within the CDC guidelines), for instance in order to prevent too many vaccines be given at one time. This could have the effect of delayed vaccines and overall lower timely vaccination rates. Without a good reminder system about the missed vaccine, this potentially created missed opportunities. Although this last PDSA was not finished due to the COVID-19 pandemic, we have found valuable data to help improve our clinic vaccination rates and have plans for next steps for our QI project in which we hope to standardize clinic-wide vaccine schedules.
- Limitations:**
 - Our QI project was interrupted due to the COVID-19 pandemic and corresponding decrease in well child and in-person clinic appointments.
 - Difficulty with data analysis of incongruent data systems: OHA vs EPIC (appears EPIC is sufficient, but has it's limitations as well and is updated infrequently)
 - Improving vaccination rates takes time, and ideally this QI project would extend over years in order to improve our PDSA and overall target outcomes.
- Next steps:**
 - In the coming months when we have more in-person office visits, we will analyze the 3rd PDSA cycle of implementing a clinic-wide vaccine schedule that is within the CDC guidelines. We expect that this will increase our rates as it will provide an understood timeline and lead to less missed vaccination opportunities.
 - Another potential PDSA would be giving parents of newborns our vaccine schedule so that they are aware of the these vaccines and when they need to schedule their well child check-ups.

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