



**St. Vincent Mercy Medical Center / Mercy Health Partners
Family Medicine Residency Program * Toledo, OH**

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No. of Residents: 24
Patient Base: Total 6,000; Children (0-3): 1,000 (combined offices)
Reporting Period: May 2007 to May 2008
Number Audited: 100 (combined offices)

Overview

We have 2 office practices within our residency program - The Gandy Center which is located in a economically depressed area of downtown Toledo, Ohio, and the Navarre Family Medicine Associations office which is located on the property of a community hospital in Oregon, Ohio. Both offices have approximately 90% of their child population receiving Medicaid. Economically and historically, our largest employers are Jeep, Chrysler, and related automaker industries, so Toledo now has one of the highest unemployment rates in the state of Ohio.

Over the past few years several office practices within the inner-city area have closed, and two other family medicine offices associated with our residency program have closed. Our offices have absorbed many of their patients. Due to the sheer sudden influx of patients, many charts were never converted over to our chart format, and were used "as is," including immunization forms.

In February 2007, a child in one of our offices received an extra immunization due to inaccurate documentation that involved multiple different areas of documentation - meaning none of the check and balance safety measures worked to prevent this medication error. Errors included the physician progress note stating only that a sick call visit had occurred; the resident who was not the child's primary care physician did not document that immunizations were given. The attending physician who precepted the resident noted on their tether link only the sick call and did not document that immunizations would still be given. The nurse failed to document on the summary immunization form that the immunization was given, but did make a written note on a separate progress note that the immunization was given and posted the sticker used to document lot number, site of injection etc. However, this progress note was filed out of date sequence and was not in the same time frame as the physician notes. The tether note by the physician was posted on a different visit than the actual visit. When the child returned for a well-child visit later, the primary care physician found no documentation that the immunization was given, noted the child was now behind on immunizations and gave the shot. After it was given, the mom commented that the child had received a shot at the last visit. After going through all of the progress notes for the past year the physician found the misfiled nursing progress note and the other omissions in documentation leading up to the error. The primary care resident was very upset that this had happened to "her" patient and used the case review as an opportunity to present the case as an outpatient "M&M" (Morbidity & Mortality) conference to the entire residency group.

Findings

- Between the two offices there were 5 different paper summary forms for recording child immunizations. The most recent form in use at the Gandy office was dated 2002 and the most recent form in use at the Navarre office was dated 1998. All new vaccines developed since that time were haphazardly written in somewhere on whatever immunization form was already in the chart as they were given to that child.
- Each office used a different system for ordering and documenting immunizations. Neither office used a recall & reminder system, neither used an electronic registry, and neither office was aware of "missed opportunities" to immunize.
- Neither office used the CDC website for customized schedules for children under the age of 6 years old.
- Decisions on which immunizations to give and when were made solely by the physician without nursing input - no one was actively reviewing the recommended on-time or catch-up immunization schedules at each visit.

After the M&M presentation, the team presented their findings to the residency program QI committee, which included the program director, faculty, the designated institutional official (DIO), both office managers, and the business manager with multiple suggestions for improvement.

Programs/Processes Instituted

During the summer of 2007, we invited an auditor from the Ohio Department of Health/Center for Disease Control's quality improvement program MOBI-AFIX to audit our pediatric immunization rate. (MOBI = Maximizing Office Based Immunizations and AFIX = Assessment-Feedback-Incentives-Exchange Program) At that time they determined the Navarre office had a 33% rate of on-time immunizations/40% late up-to-date, and the Gandy Office was 42% on-time/ 50% late UTD.

Immediately after the audit, both offices began using the most current immunization paper recording form created by the Ohio Dept of Health, dated 2007.

We reviewed and changed our office procedures for communicating the need for immunizations between nursing staff and physicians, and how immunizations are ordered and recorded as given by both physicians and nursing staff.

We also started doing chart audits that compared if the attending tether links accurately reflected the resident's plan of care, including immunization status and opportunities for missed immunizations, and whether the teather link is posted on the same page of the resident progress note for each visit.

In the fall of 2007 we arranged for a demonstration of the State of Ohio electronic immunization registry, IMPACT SIIS for the staff of both offices. Afterwards, the Navarre office manager wanted to implement the electronic registry. The Gandy office manager felt she did not have the staff time or computer resources to commit to learning an electronic system.

We decided to try a research project using the Gandy office as the control for the old paper documentation system and use the Navarre office as the experimental group who would maintain both paper documentation and the electronic registry. We applied for and received Pediatric Institutional Review Board (IRB) approval (P#0108103) for the research project, ***"Implementing Change in the System of Care for Pediatric Immunizations: The Journey from an M&M to Clinical Practice Improvement."***

In December 2007 the Navarre office received their first training session for the IMPACT system and incorporated the software applications into their computer system. In April of 2008 the office took the advance IMPACT training course to learn how to use the system for inventory, lot number documentation, and the recall & reminder system. By this time, the staff felt they were comfortable with the system and were past the "learning curve."

In April 2008 we had the auditor return to establish a new baseline measurement for both offices. The new audit showed the Navarre office at an improved rate of 60% for on-time immunizations/80% late UTD and the Gandy office at a continued rate of 41% for on-time immunizations/53% late UTD.

On April 12, 2008, we presented our findings and quality improvement activities as both poster and oral presentations at the annual Ohio Family Medicine Symposium on Research and Education in Newark, Ohio. This allowed us to share the lessons we learned about improving our own practice and to disseminate information about best practices for pediatric immunizations to other Ohio residency programs and private physician practices. Many had never heard of the state immunization registry IMPACT SIIS. We also presented the information as a poster presentation at the regional St. Vincent Mercy Medical Center and Mercy Health Partners Research Symposium on May 2, 2008

In January 2009 we again had the MOBI/AFIX auditor come to the offices. At this time the Gandy office continued using only the paper documentation method and their on-time immunization rate was 40% (unchanged from the previous 2 audits) at and their late UTD immunization rate had dropped to 40%. The Navarre office that implemented the electronic registry was now at 64% on-time/ 64% late UTD. While the Navarre staff was disappointed that the improvement was not greater, investigation found that the rate was affected by 2 key factors: new pediatric patients had recently transferred into our practice from another practice and were not up-to-date from their previous care provider, and secondly, the number of patients born in 2006 only allowed for an analysis of 11 charts (Charts audited by MOBI/AFIX are limited to a specific birth year to allow comparisons across cohorts and up-to-date immunization data by 24 months of age).

One key advantage of each immunization chart audit is the auditor/trainer returns to each office to personally discuss the results, offer suggestions for improvement, and provide ongoing education to staff related to emerging vaccine issues, updates, and current best immunization practices. Following the January 2009 audit, the Navarre office realized they were not fully using the automated recall and reminder system available through the electronic registry and immediately implemented it into their practice.

Our primary challenge has been demonstrating that the time and effort involved with improving pediatric immunizations has been of value, considering that the majority of our practice population are older adults and children under the age of 3 make up less than 2% of our patient population. The January audit clearly pointed out that as new patients come into the practice, the electronic registry will be invaluable in picking up invalid doses and missed doses, and will allow us to accurately "catch up" new pediatric patients who transfer into our practice. We have also made an effort to "grow" more pediatric patients into our practice and over the past year several pregnant moms and newborns have come into the practice.

The Ohio Registry hopes to add an adult immunization registry in the near future so familiarity with the electronic system will allow our Navarre office to be in the forefront of implementation for adolescent and adult immunizations as well. This will be especially important with increased encouragement for adolescents to receive HPV and Meningococcal immunizations.

Our new challenge is to implement the electronic immunization registry at the Gandy office. They are now in negotiations to be the pilot office for implementation of a comprehensive electronic medical record system that will eventually be implemented in all residency program medical offices within Mercy Health Partners.

Summary of Vaccination Coverage

VACCINE	U.S. Overall 2004, NIS Compliance %	Baseline Compliance Rate %	Improved Compliance Rate %	Change in Compliance Rate % (Improved-Baseline)
DTP/DTaP/DT (4 doses)	84.8 (+/-0.8)	47.00	60.00	13.00
IPV (3 doses)	91.6 (+/-0.7)	80.00	100.00	20.00
MMR (1 dose)	93.0 (+/-0.6)	80.00	80.00	0.00
Hib (≥ 3 doses)	93.5 (+/- 0.6)	87.00	100.00	13.00
Hep B (≥ 3 doses)	92.4 (+/-0.6)	67.00	100.00	33.00
PCV 7	73.2 (+/1.0)	80.00	100	20.00
Varicella (≥ 1 dose)	87.5 (+/-0.7)	67.00	80	13.00
VACCINE SERIES				
4 DTP+3 IPV+1 MMR	83.5 (+/-0.9)	69.00	80.00	11.00
4 DTP+3 IPV+1 MMR+3 Hib	82.5 (+/-0.9)	75.00	90.00	15.00
4 DTP+3 IPV+1 MMR+3 Hib+3 Hep B	80.9 (+/-0.9)	40.00	80.00	40.00
4 DTP+3 IPV+1 MMR+3 Hib+3 Hep B+1 Var	76.0 (+/-1.0)	33.00	60	27.00