Good afternoon, I am Andrea Aguilera. I am a pediatric chief resident at Riley Children’s Hospital in Indianapolis and I will be speaking to you about a quality improvement project that I have been working on for the past two years to improve resident knowledge of epinephrine autoinjector use and peanut introduction guidelines.
This is Riley, where I have spent the past 4 years.
Pediatric resident knowledge on the use of epinephrine auto-injectors (EAs) has not been widely studied.\(^{(1-3)}\)

Health care provider awareness of peanut introduction guidelines can vary. \(^{(6-9)}\)

In 2018 and 2019 we assessed the awareness of peanut introduction guidelines and epinephrine autoinjector usage among pediatric residents at Indiana University School of Medicine (IUSM).

Indiana University School of Medicine pediatric residency program is a large academic medical center with roughly 160 pediatric and combined pediatric specialty residents (PGY1-PGY5).

Based on these findings we implemented a quality improvement project to address the deficits that were found.
Objective of discussion today will be to..
For our research design we sent a multiple choice survey to obtain baseline knowledge from residents from January 2018 to July 2018. All pediatric residents were surveyed.

We then implemented a new curriculum in August of 2018. This curriculum included handouts, videos, podcasts, modules, and simulation training.

A follow up survey was sent in July 2019 to assess the quality of these interventions.
In 2018, 48% of residents responded to the survey. The breakdown by PGY year is shown to the right. Out of the respondents you can see majority were interns and 2nd year residents, however 40% of residents from each individual class year were collected in data.

It is understandable that there were fewer PGY4 and 5s as those residents are only combined program residents and therefore start with 26 fewer.

new PGY1 [30/46; 65%]; middle PGY1 [25/45; 56%]; PGY2 [19/44; 43%]; PGY3 [17/43; 40%]; PGY4+ [4/20; 20%].
40% of residents reported they did not know how to use an epipen with no significant difference among class years responses. N=38
The first question was:
70% answered correctly.

A) 6 mo
## Baseline Survey Questions

- 2. Which patients are considered high risk for peanut allergy?
  - A) patient with severe eczema
  - B) patient with egg allergy
  - C) both of the above
  - D) none of the above
  - 52% of residents answered correctly

C
Baseline Survey Questions

3. How do you first screen peanut allergy in an at-risk patient?
   - A) Obtain a panel of serum IgE levels to common food allergens (eggs, peanuts, tree nuts, wheat, soy, shellfish.)
   - B) Obtain serum IgE level for peanut allergen in clinic
   - C) Refer to an allergist for skin prick testing
   - D) B or C
   - 49% of residents answered correctly
Baseline Survey Questions

- 4. True or False: Early exposure to peanuts in patients with a high risk for peanut allergy (who have been screened appropriately) can prevent the development of peanut allergy in some patients.
- 87% of residents answered correctly
Baseline Survey Questions

• 5. How comfortable do you feel explaining to parents how to introduce peanut products to infants?
• 53% of residents were comfortable advising families on peanut introduction
In summary, only 60% of residents knew how to use an epinephrine autoinjector. 70% recognized peanut product can be introduced at age 6 months; 87% knew early introduction reduces risk of the development of peanut allergy, however only 47% recognized high-risk infants.
- so with this data in mind, I created education tools to help the residents
- The first tool was a handout that included an algorithm for safe peanut introduction for pediatricians, taking into account the patients risk factors.
- The handout also included tips for home introduction that could be shared with families.
The handout also contained an algorithm for IgE testing and skin prick testing.
We then supplied a 5 minute video discussing peanut. It was initially advertised to be played at continuity clinics and later for residents to view on canvas.
- We also provided modules with allergy education. This education provided power points and quizzes on common allergy and immunology topics, not just limited to peanut introduction and epinephrine autoinjector use. Videos, articles, and handouts were also made available on this site. Canvas modules were encouraged to be completed during AI and pulmonology rotations by coordinators.
Next we created a podcast on the IU resident board review station, pedsinapod. The podcast is 15 minutes long and discussed food allergies and peanut introduction. It is currently downloaded in all 50 states and across the world with 3,057 views as of January.
Lastly, we incorporated EM simulation to practice EAI use. Read each bullet point. There are multiple stations included in sim. Two of the stations are allergy focused. Station 1 is an Anaphylaxis case and station two does not have a patient and instead allows the residents to work with a provider to practice with the equipment and EAls.
Follow Up Survey Questions

- Same as baseline survey
- +
- Have you taken a peanut allergy survey before
- Which of the following educational tools did you use?
53% of residents responded to the follow up survey. Over 40% response rate again per class year with 84% of interns responding this year. 49% of residents had taken the survey before. Follow up survey results 1 year after interventions were as follows:

PGY1 [21/25;84%], PGY2 [23/44;52%], PGY3 [18/41,43%], PGY4+[9/23;39%].

49% of residents had taken survey before: n=35/71
Follow Up Survey Results

Do you know how to use an automatic epinephrine injector?

- 18% NO
- 82% YES

Previously 60% answered correctly. p = 0.02
With all follow up peanut introduction questions, residents showed some improvement. However there was only significant improvement in residents who felt comfortable with explaining peanut introduction to parents.
EAI knowledge without significant diff among class years  
53% n= 50/95  
75% n= 53/71  

The overall pediatric resident response rate in initial survey was 48% (n=95/198; new PGY1 [30/46;65%]; middle PGY1 [25/45; 56%]; PGY2 [19/44; 43%]; PGY3 [17/43; 40%]; PGY4+ [4/20; 20%]). The repeat survey response rate was 53% (n=71/133; PGY1[21/25;84%], PGY2 [23/44;52%], PGY3 [18/41,43%],PGY4+[9/23;39%]. Forty-nine percent of resident respondents had taken the survey before (n=35/71;49%).- TABLE?
- Majority of residents had not yet accessed canvas education tools due to a number of access issues I will discuss on the next slide. Of the tools that were utilized:
  - ER simulation was reported as the most helpful tool when residents were surveyed (16% residents preferred this method)
  - Podcasts and Modules were equally the second most helpful resource with 12% of residents preferring these tools.
Some of the Access issues included canvas access not being sent to all residents by coordinator. This has been addressed and now all residents have access and will be reminded by coordinators.

- We also had technical issues with sound on videos being played at clinic sites. Videos have now been uploaded to canvas to trouble shoot this issue.

- Lastly, we had distribution issues with handouts not being given at certain continuity clinic sites. Handouts are now on canvas.
Summary

• Changes in resident curriculum led to:
• Increased knowledge on use of epinephrine auto-injectors
• Some improvement on the knowledge of peanut guidelines, particularly resident comfortability with parents.
### Future directions

- Improving access to all residents to canvas modules
- Handouts and Videos uploaded to Canvas Site to resolve distribution and upload issues
- Reminders sent by coordinators for residents to complete modules
- Continued EM Simulation training
- Increased hands on activities
- Continued surveys

more hands on activities: how to feed infant peanut butter- primary care track curriculum? Continued surveys to assess effectiveness
Acknowledgements

- Dr. Girish Vitalpur
- Dr. Meagan O’Niell
- James Slaven MS
References

Thank you!