Appropriateness of Antibiotic Use in Adult Sinusitis at FMC

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Background: Acute Sinusitis

- Caused by a viral or bacterial infection, allergy, or irritants
- 90-98% cases are viral
- Most resolve without antibiotic treatment
- More than 4.3 million adults annually experience symptoms
- Results in 16 million office visits and $5.8 billion in health care costs annually

Background: Antibiotic Use

- Guidelines and multiple studies suggest should not be routinely used in treatment of mild to moderate acute sinusitis
- Symptom reduction is slightly better to no different than placebo
- More adverse effects than supportive care.
- NNT: 13-18 and NNH: 8 in meta-analyses
- Despite evidence, still prescribed in > 80% of outpatient cases and comprise up to 21% of outpatient antibiotic prescriptions

“Don’t routinely prescribe antibiotics for acute mild-to-moderate sinusitis unless symptoms last for seven or more days, or symptoms worsen after initial clinical improvement. Symptoms must include discolored nasal secretions and facial or dental tenderness when touched.”

-Choosing Wisely

Background: Similar Studies

- Varied in regards to focus: acute sinusitis vs acute respiratory tract infections, rate of antibiotic prescription, type of antibiotic prescription, ENT vs PCP prescription rates, and pediatric vs adult population

- Much larger sample size (thousands to millions of patients)

- Duration varied (1 year to 10 years)

- Used data from databases (e.g., Medical Quality Improvement Consortium), surveys (e.g., National Ambulatory Medical Care Survey, National Hospital Ambulatory Medical Care Survey), and multi-clinic EMR review to calculate rates of appropriate antibiotic prescriptions

Objectives

- To determine if *Choosing Wisely's* criteria for prescribing antibiotics for the treatment of acute sinusitis was met for each case that was prescribed antibiotics at FMC

- To evaluate the antibiotic prescription pattern, specifically the rate of appropriate antibiotic use, in cases of adults with sinusitis at the UnityPoint Methodist Family Medical Center (FMC), so that more relevant recommendations for improving antibiotic stewardship, decreasing cost, and protecting patients from unnecessary treatment at FMC can be made.

Expectations

It is expected that the majority of patients, who were diagnosed with and prescribed antibiotics for acute sinusitis at FMC between January 1, 2014 and December 31, 2016, should not have received antibiotics according to the *Choosing Wisely* recommendation.

Methods

- Approved via expedited IRB review.
- Retrospective review of medical records at UnityPoint Methodist Family Medical Center (FMC)
- 125 patient encounters reviewed per inclusion/exclusion criteria
- Both researchers performed chart review together for all encounters to ensure consistency.

Methods

Inclusion criteria:

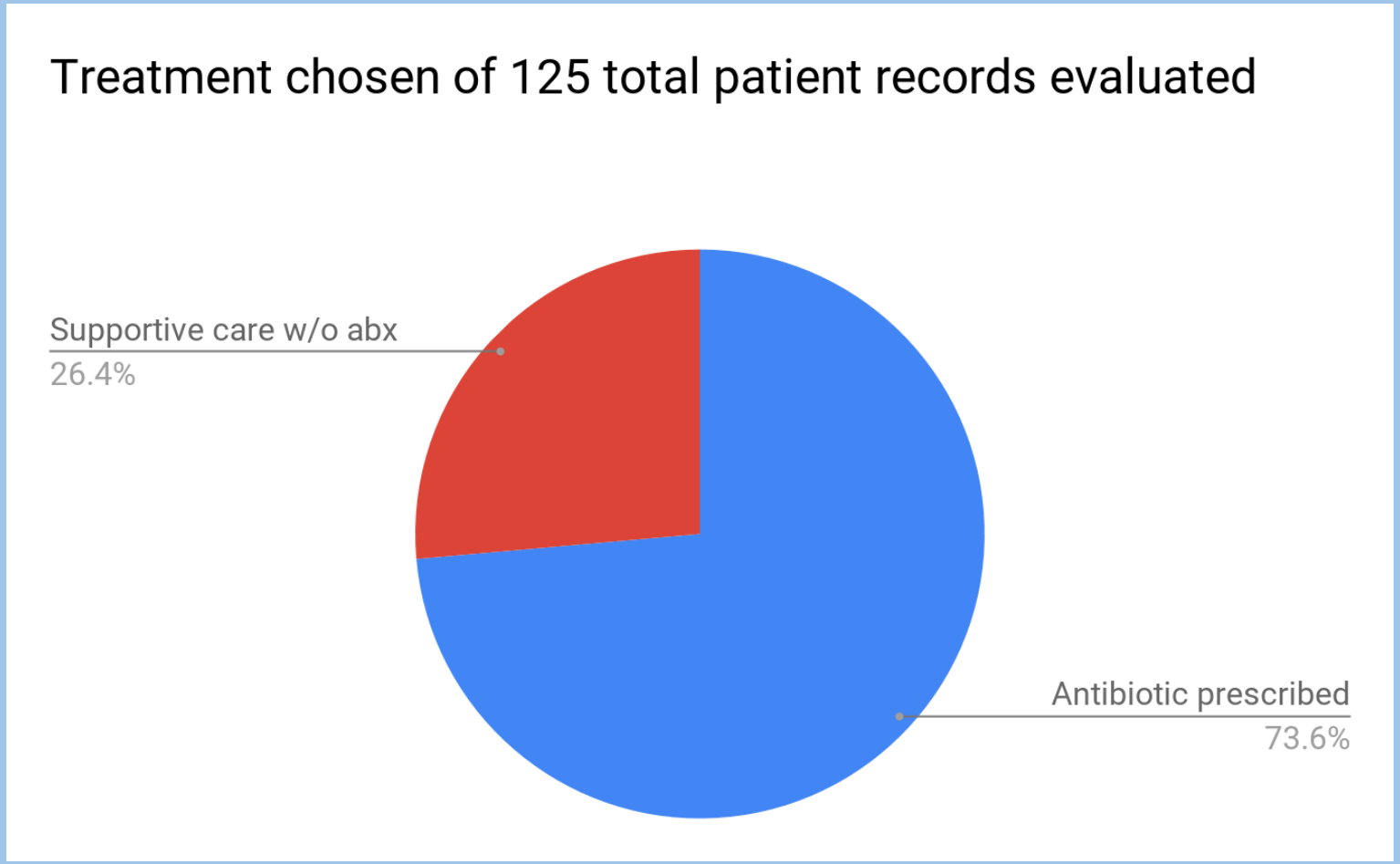
- males or females
- ages of 18 and 65
- diagnosed with acute sinusitis or a variant of acute sinusitis (ICD 10 codes: J01.00, J01.10, J01.20, J01.30, J01.40, J01.80, J01.90)
- Initially diagnosed by residents, attendings, mid-level providers at FMC
- from January 1, 2014 to December 31, 2016.

Methods

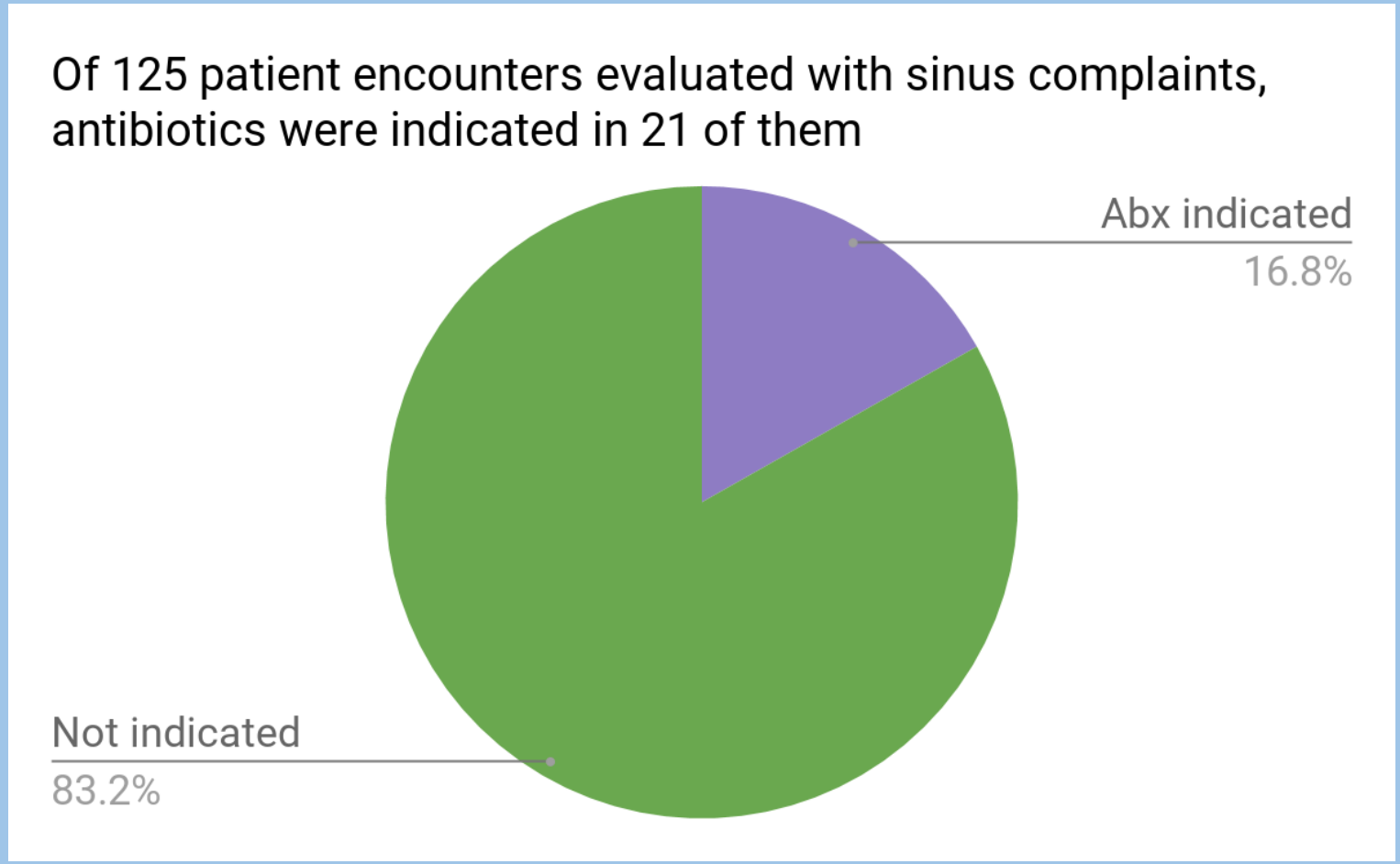
Exclusion criteria:

- pregnant at the time of diagnosis
- diagnosed with chronic sinusitis (ICD-10 codes J32.0, J32.1, J32.2, J32.3, J32.4, J32.8, J32.9), or had recurrent sinusitis (diagnosed with acute sinusitis on 4 or more occasions in 1 year or using ICD-10 codes J01.01, J01.11, J01.21, J01.31, J01.41, J01.81, J01.91).
- Subsequent visits for the same episode of acute sinusitis

Primary Results



Primary Results



Primary Results:

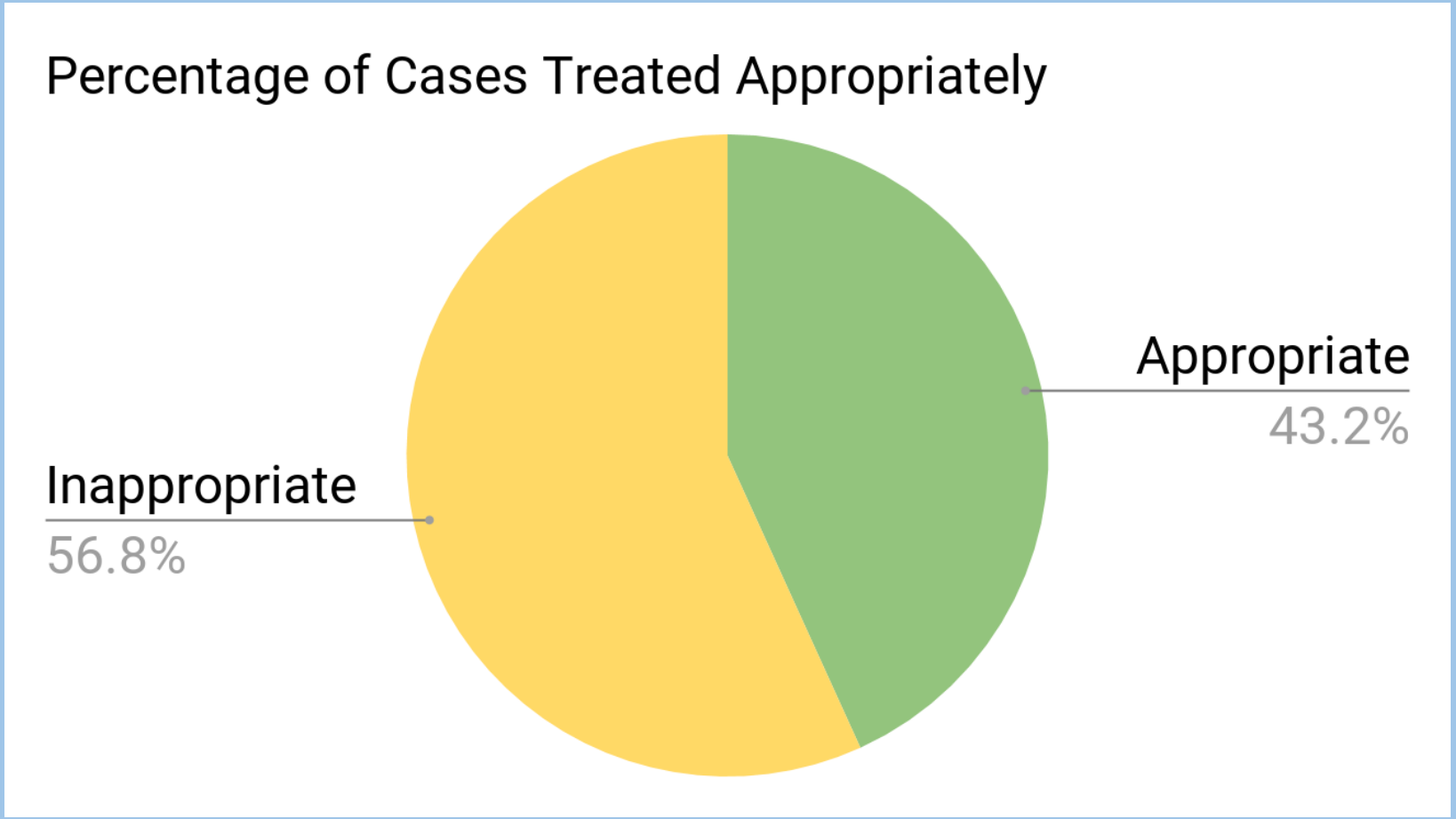
Of 33 cases where **supportive care without antibiotics** was prescribed:

- **None** met Choosing Wisely Criteria for treatment with antibiotics

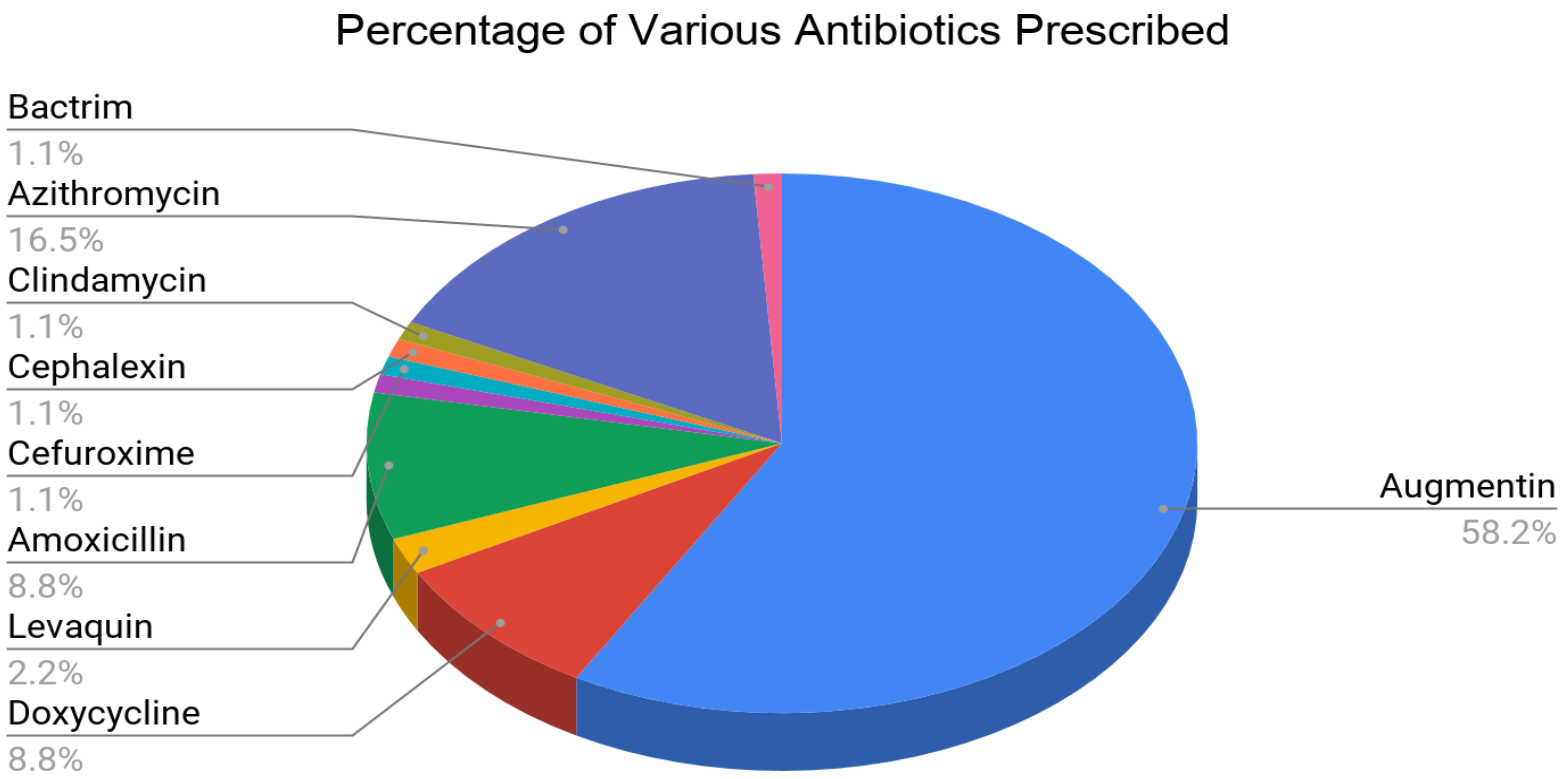
Of 92 cases where **antibiotics were prescribed**:

- **21 cases (22.8%)** met Choosing Wisely Criteria for treatment with antibiotics

Secondary Results: Overall Treatment of Sinusitis



Secondary Results: Type of Antibiotic Prescription



FMC prescribed the recommended (1st or 2nd line) antibiotic in 69.23% of sinusitis cases that received antibiotics.

Limitations

-Use of varying ICD-10 codes by providers - may have affected population size or impacted results
-Limited to 3 years due to research timeline, available work hours of researchers. Affected population size and decreased power of overall results.
-Presence or absence of key HPI and physical exam findings frequently not documented.

How Do We Compare?

- Gill JM, et al. Use of antibiotics for adult upper respiratory infections in outpatient settings: a national ambulatory network study. Fam Med
  - **81%** cases prescribed antibiotics for acute sinusitis
- Smith SS, et al. Variations in antibiotic prescribing of acute rhinosinusitis in United States ambulatory settings. Otolaryngol Head Neck Surg.
  - **82.3%** cases prescribed antibiotics for acute sinusitis
- Fairlie T, et al. National Trends in Visit Rates and Antibiotic Prescribing for Adults With Acute Sinusitis. Arch Intern Med.
  - **83%** cases prescribed antibiotics for acute sinusitis

How Do We Compare?

- Fleming-Dutra, et al. Prevalence of Inappropriate Antibiotic Prescriptions Among US Ambulatory Care Visits, 2010-2011.JAMA.
  - 353 of 506 (**69.8%**) antibiotic prescriptions were deemed to be appropriate
  - Study was not limited to sinusitis

Discussion

We can do better.

- Keep evidence based criteria in mind when seeing patients with sinus complaints.
- Ask the right questions.
- Counsel patients on symptomatic care, risks of unnecessary antibiotic use.

Discussion

Review of Choosing Wisely criteria:

All the following must be present to justify antibiotic use:

- Presence of symptoms > 7 days **OR** initial improvement followed by worsening of symptoms
- Discolored nasal secretions
- Sinus or dental tenderness to palpation on physical exam.

Discussion

Which Antibiotic to Prescribe

- 1st Line
  - Augmentin
- 2nd Line (penicillin allergy)
  - Doxycycline
  - Fluoroquinolone
  - If Clindamycin is given, must be given with 3rd generation Cephalosporin
- Macrolides, Bactrim, and 2nd and 3rd generation Cephalosporins (e.g., Cefuroxime) are **NOT** recommended due to high rates of S. pneumo and H. flu resistance

Discussion

Future Research Implications

- Expand scope of research to include a longer time period, other clinical locations or settings.
- Similar research for other common infections.
- Implement clinic or system wide programs to improve antibiotic stewardship of providers, and study effectiveness of these programs.

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Confidence Interval

95% confidence interval for rate of appropriateness of antibiotics prescribing is [10.3%, 23.4%].