A collaboration between medical residents and pharmacy team in a Family Medicine Outpatient Center

Multidisciplinary Medication Reconciliation

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A Member of Trinity Health

Medication Errors: A Critical Problem

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According to WHO, 6-7% of all hospital admissions are medication-related with two thirds of those errors considered avoidable (1)

31% of EMR related malpractice claims involved medication errors (2)

In the UK, 11% of all prescriptions have discrepancies…

…and cost £400 million annually. (3)

The challenges of medication reconciliation in our family medicine outpatient clinic

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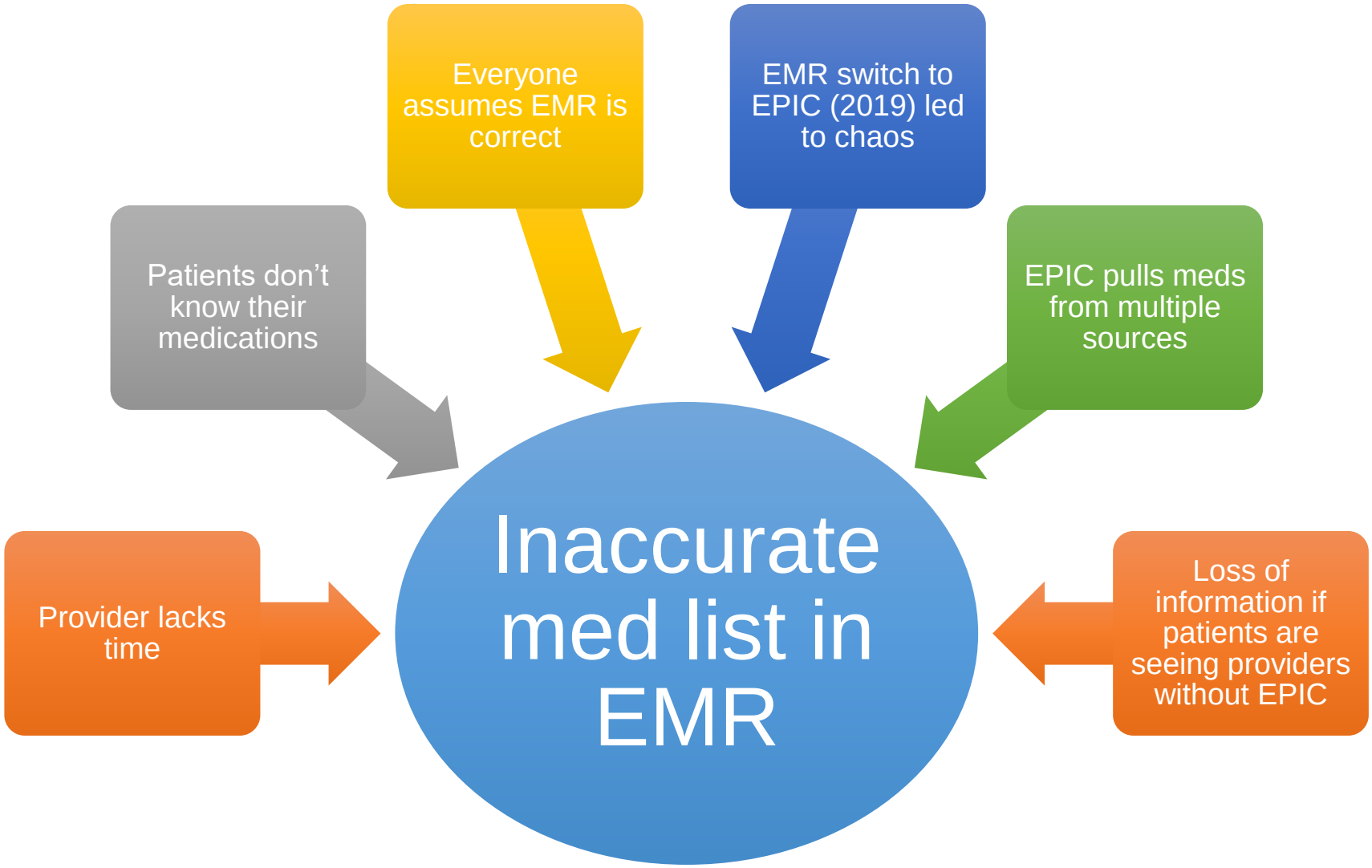

Benefits of Interdisciplinary Team Work

- Medicine and EMR are getting more complicated; pharmacists understand medications and interactions to a higher degree
- Pharmacy students have interest, time and training for detailed medication reconciliation
- Access to discussion with clinical PharmD, who can discover problems and make suggestions.
- Patients seemed to enjoy the extra attention and information

Examples of previous work

- Student Pharmacists in a large outpatient family medicine center identified 2.6 discrepancies per patient medication reconciliation and that patients were taking OTC and herbal preparations unknown to their PCP (4)

- In a study, looking at patients over the age of 18 and on at least 10 medications an average of 6.6 discrepancies were found per patient (5)

- Another study implemented pharmacy students in a hematology/oncology clinic and found 88% of patients had at least 1 medication discrepancy (6). In a primary care center, it was found that 74% of patients had at least 1 discrepancy (7)

- When examining hospital readmission rates, a significant reduction was seen in patients that had a pharmacist perform medication reconciliation at time of hospital discharge (from 20% to 6.5%) (8)

Our Project

1. Can we create a protocol in EPIC for multidisciplinary medication reconciliation?

2. Given limited resources in our clinic, it would be useful to ask the research question: **Which patient risk factor(s) correlate with a higher number of medication discrepancies?** In other words, which patients would benefit most from an interdisciplinary medication reconciliation?

Philosophical Question

		ON EPIC		
		Pre-Rec	Post-Rec	Adherence
Patient (MRN)	Seen in Clinic	# Total Meds	# Total Meds	# Correctly Taking
[redacted]	1	15	11	5

What is a Discrepancy?

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Rather than error, we decided to use the term discrepancy:

Discrepancy: an inconsistency between EPIC list and patient adherence, OR inconsistency between EPIC list and pharmacy record

1. Not taking medication
2. No record
3. Different Drug
4. Different Strength
5. Different Signature
6. Duplication
7. Non-compliance

Patient Reported Inconsistencies					
Not Taking (#)	No EPIC Record	Drug (#)	Strength (#)	SIG (#)	Duplication (#)
4	0	0	0	4	0
2	2	0	0	4	0
1	0	0	0	1	0

Pharmacy Reported Inconsistencies					
No Record (#)	Non-Compliance (#)	Drug (#)	Strength (#)	SIG (#)	Duplication (#)
1	0	0	1	1	0
0	2	0	1	0	0
2	0	0	0	1	0

Risk Factors

General (#)						
Age	Gender (M=0/F=1)	Language (Eng=1/Spn=2/Oth=3)	Ethnicity	Education level	Hospitalizations in last 7 days	Hospitalizations in last year
63	1	1	2	5	0	0
48	1	1	2	1	0	0
66	1	1	2	2	0	0

Age
Gender
Language
Hospitalizations in last 7 days or last year
Total Number of Medications (Pre Med Reconciliation)

Comorbidities

- Anxiety/Depression
- Diabetes
- Heart Disease
- Asthma/COPD
- HTN
- Kidney Disease

Comorbidities Present (N=0, Y=1)					
Diabetes	Anxiety/ Depression	Heart Disease	Asthma/ COPD	HTN	Kidney Disease
0	1	0	0	1	0
1	1	0	1	1	0
0	1	0	0	0	0

Patient Inclusion and Exclusion Criteria

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Patient Inclusion Criteria:

- 18 + years old
- Dr. Knott and Dr. Harvey's clinic patients
- 3+ chronic medications
- Must answer phone (at least 2 attempts)

Patient Exclusion Criteria:

- Patients not seen since Aug 2019
- Patients who already had a medication reconciliation, during this cycle

Medication Inclusion and Exclusion Criteria

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Medication Inclusion Criteria:

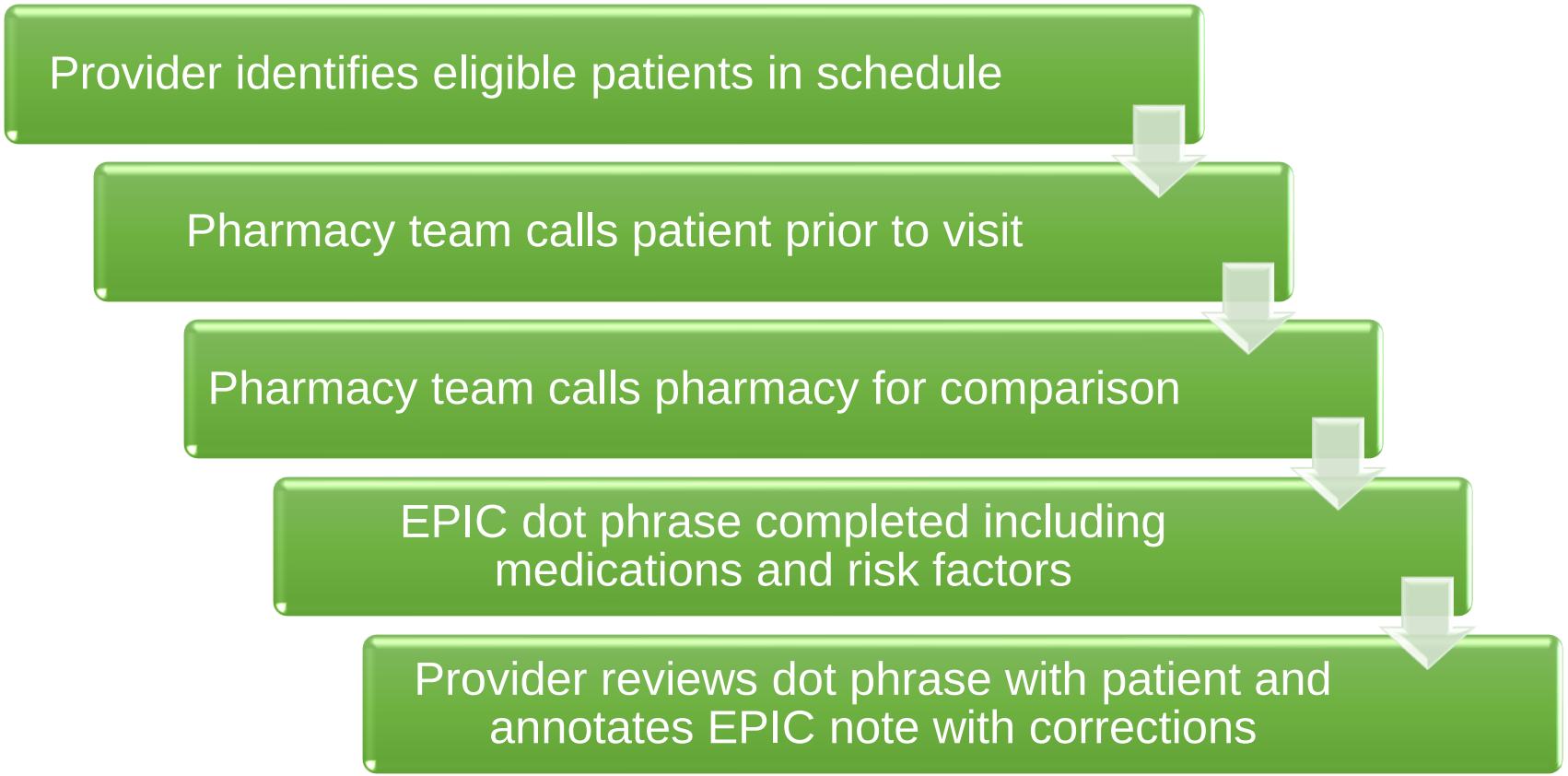
- Chronic Medications
- Meaningful PRN medications (Xanax, Norco)
- Include all vitamins

Medication Exclusion Criteria:

- Rarely used PRN medications (usually prn tylenol, ibuprofen, miralax, lidocaine patches, etc)
- Short course medications from the past the patient is no longer taking (antibiotics)
- Glucose test strips, needles, alcohol swabs, lancets as medications and other medication equipment

Our reasoning: identify clinically meaningful discrepancies

Protocol



Then reconcile meds in EPIC & route to pharmacy student to record data.

Dot Phrase: Provider Addendum

Dot Phrase

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Buch, Juhi

Note 2:12 PM

FMC Pharmacy Student Medication Reconciliation

Patient was called at 12:30 PM on 10/21/20 to perform a medication reconciliation prior to an appointment on 10/21/20 with Dr. Knott. Conversation was conducted via doximity audio with the patient.

An interpreter WAS NOT used.

Patien

Risk F

1. Ag
2. Se
3. Pr
1. Hi
2. Ra
4. To
5. To
6. Ho
7. Di
8. Di
9. Di
10. Di
11. Di
12. Di

Provider Addendum (FMC Medication Reconciliation)

Patient **did** attend their clinic visit with me.
I reviewed medications and discrepancies with patient: Yes

I agree with the medication reconciliation recommendations & risk factors, with the following additional changes or comments noted by provider: none

I updated medication list in Epic to reflect recommended changes: Yes and called the pharmacy to change or discontinue critical incorrect medications: No

Total # of Epic medications (PRE-med rec): I agree with the number listed above (any meaningless prn medications removed

Total # of Epic medications (POST-med rec): 2
(does NOT include additional medications prescribed at this visit or NEW changes made to medications at this visit)

 # Correct medications: 2
(correct by Epic, patient adherence, AND pharmacy)

Routed to pharmacy student; ready to record data: Yes

Madeline Knott, MD (Res/Fel)

Results

Medication reconciliations done: N=89

Mean Total Discrepancies: 2.21

Mean Comorbidities: 1.72

Mean number of medications:

- Pre-Med Rec: 6.74
- Post-Med Rec: 6.29

Results: Insignificant Data

Continuous Independent Variables (Pearson Correlation)

- Age
- Number of comorbidities

Categorical Independent Variables (Chi Square Significance)

- Gender
- Language
- Hospitalization in last 7 days
- Ethnicity
- Education level
- Heart disease
- HTN
- Kidney disease
- Diabetes

All Insignificant.

Results: Significant Data

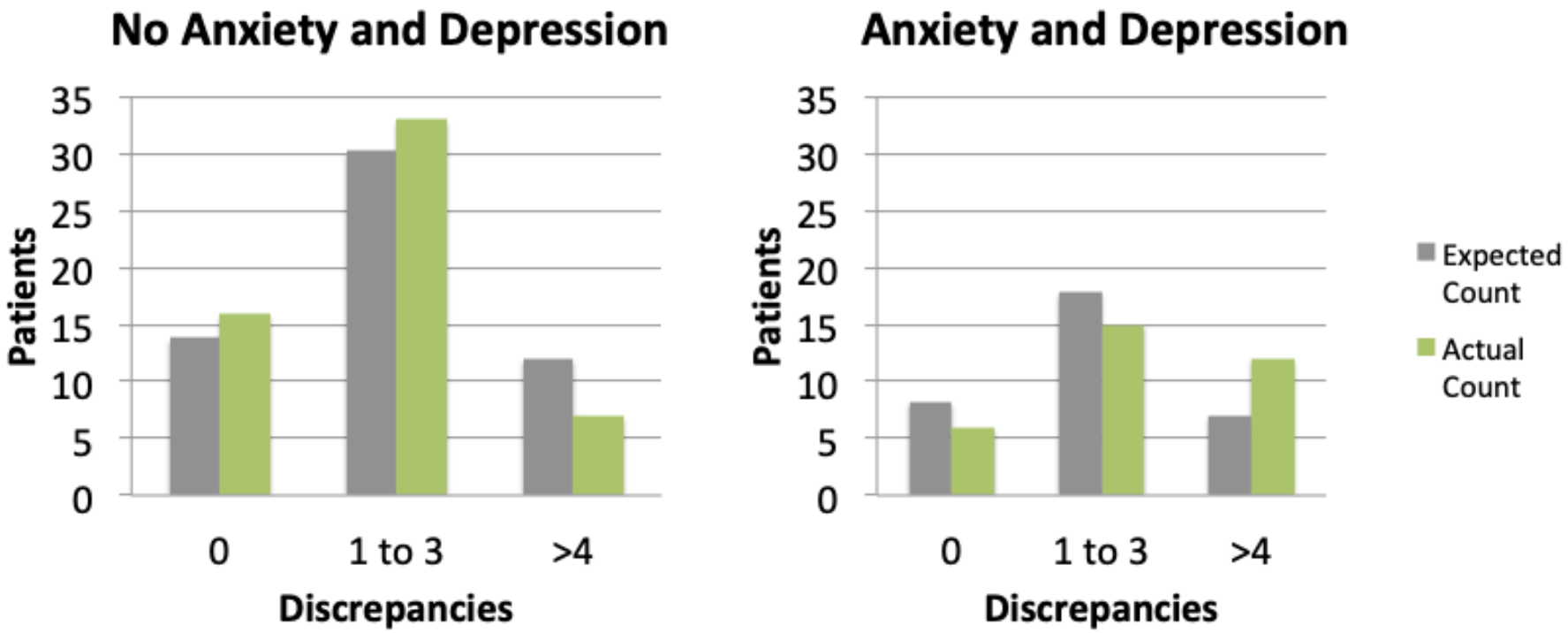
		PreRecTotalMeds	Total#Errors
PreRecTotalMeds	Pearson Correlation	1	.403**
	Sig. (2-tailed)		.000
	N	89	89

Positive correlation

Significant to the 0.01 level

Correlation between number of medications in EPIC (pre-med rec) and total number of discrepancies in FMC patients

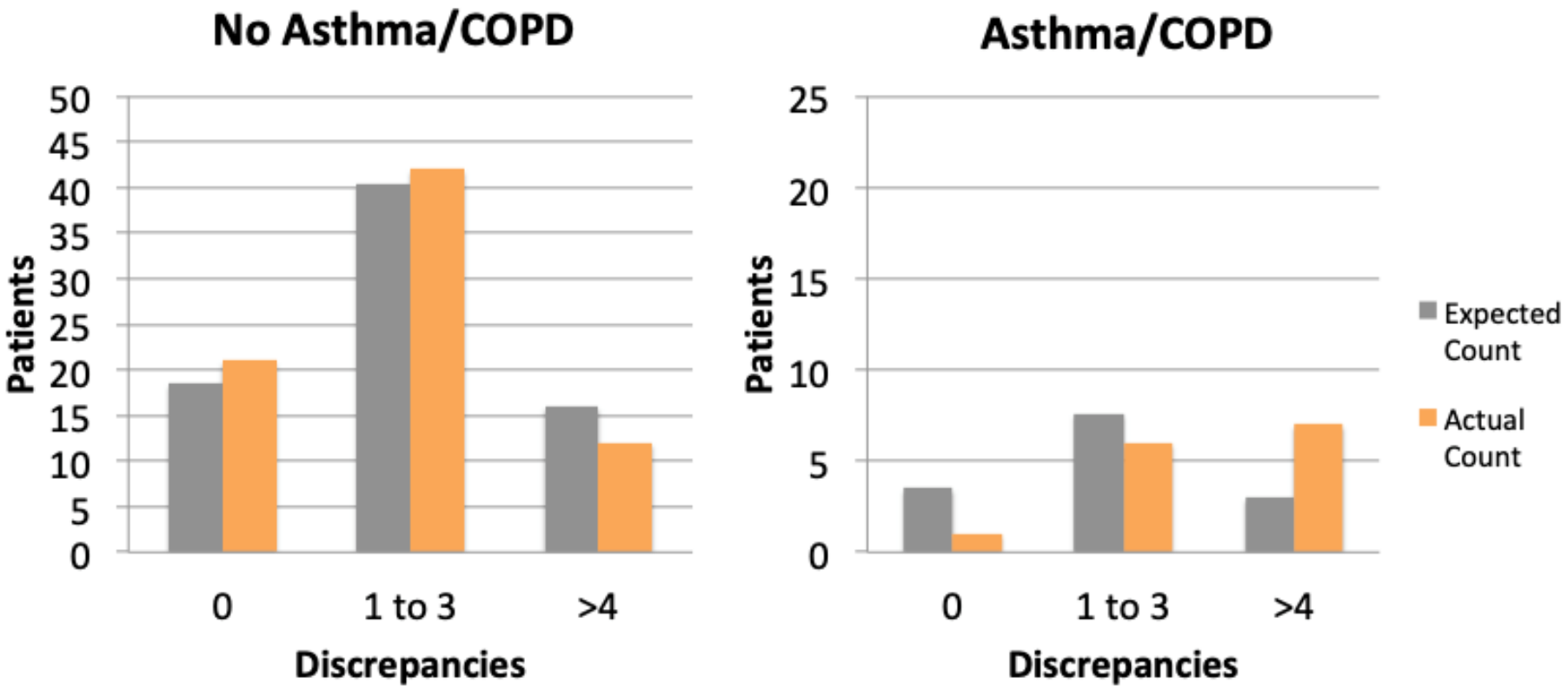
Results: Significant Data



Discrepancy trends in patients with and without anxiety/depression

Pearson Chi-Square Significance: 0.028

Results: Significant Data



Discrepancy trends in patients with and without asthma or COPD

Exact P Value (Fisher Exact Test): 0.019

Discussion

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Number of Pre-Med Rec Medications

- Clear positive correlation between # of meds in EPIC pre-med rec and # of discrepancies noted after med-rec

Possible reasons:

- Proportionally, if a patient takes more medications, then there are more opportunities for discrepancy
- Patients who are on a higher number of medications may have difficulty taking them correctly
- Polypharmacy makes things harder to reconcile for physician and pharmacy as well

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Anxiety/Depression

- Patients with anxiety and/or depression skew towards a higher number of discrepancies

Possible reasons:

- The mood symptoms associated with anxiety and depression (if uncontrolled) can make it difficult to consistently and correctly take ANY medications (psych or otherwise)

- Patients seeing psychiatrist are often not on MacNeal EPIC, some of these meds may be missed by our system

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Asthma/COPD

- Patients with asthma and/or COPD skew towards a higher number of discrepancies

Possible reasons:

- Difficult to correctly take inhalers – they are often complicated, incorrectly used, or not taken at all, especially daily inhalers without immediate relief
- They are expensive (for example, some patients never pick it up after prescribed)

Limitations

- **Small to medium sample size** (N=89)
- **MacNeal's population is skewed towards certain demographics** (Hispanic, lower income)
- **Only patients from 5 female providers evaluated,** may affect patient demographic. Provider's own consistency with medication reconciliations may vary as well.
- **Difficult to categorize discrepancies consistently**, despite taking time to define them
- **Some patients not reachable by phone** or were confused by questions

Future Directions

- Consider setting up a med rec program at our FMC for patients who are high risk:
  1. **Have a high number of medications in EPIC and/or**
  2. **Have anxiety/depression, or asthma/COPD**

- There are numerous other academic questions that can be explored using this model. Two current PGY2s plan to continue a similar project.

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Questions?

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