

6-2019

IHDPS (Institute for Healthcare Delivery & Population Science) Poster - 2019

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BACKGROUND

Global Initiative for Asthma guidelines recommend antibiotics (AB) for asthma exacerbations only when there is strong evidence of lung infection.

Prior studies show:

- 30-50% of patients with an asthma exacerbation receive AB.¹
- AB therapy for asthma exacerbations may be associated with a longer hospital stay and higher care costs.²

To date, no studies have examined the determinants of antibiotic prescribing for asthma exacerbation.

Objective: to assess barriers and facilitators to appropriate AB prescribing in asthma exacerbations through interviews and focus groups with healthcare providers.

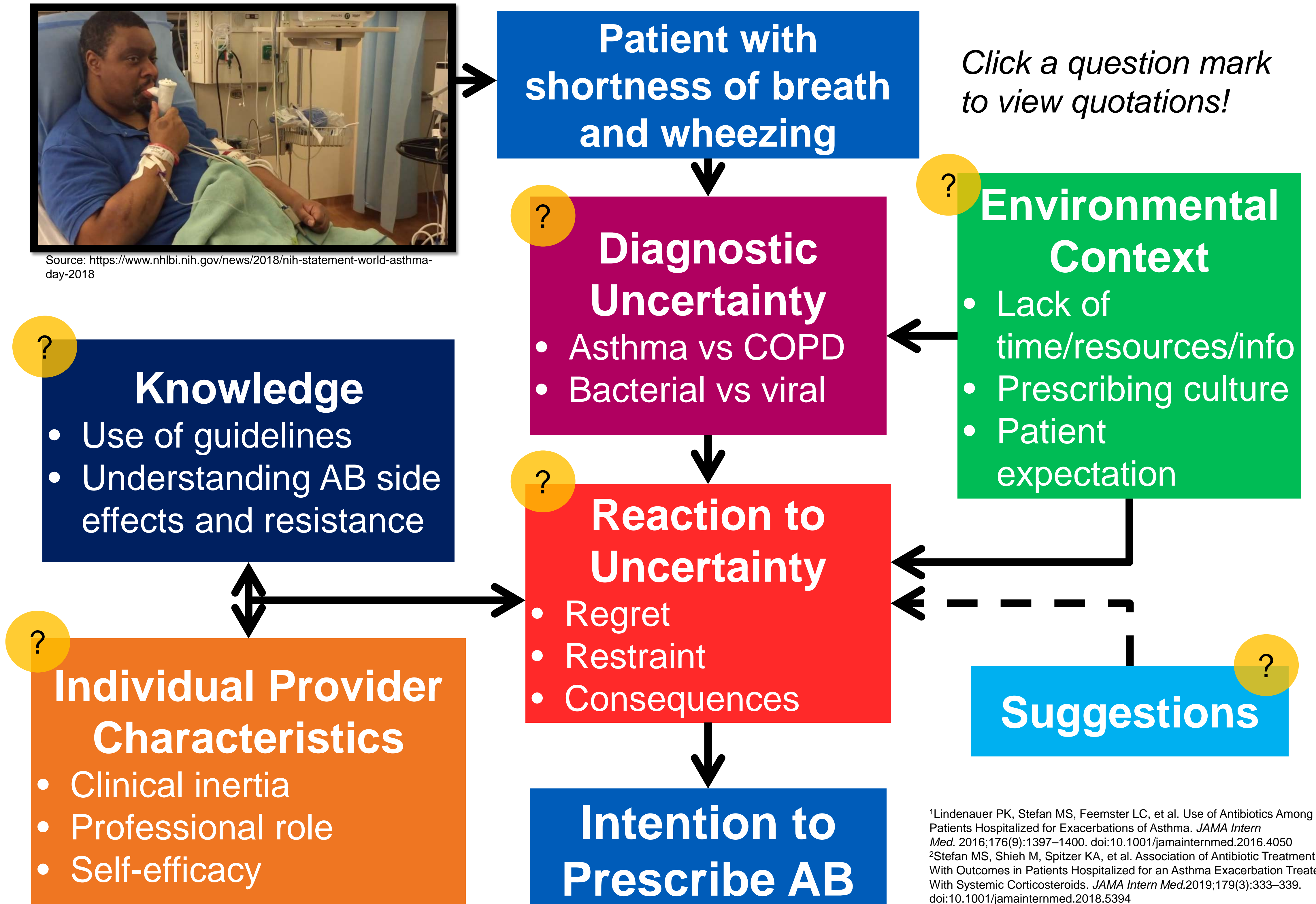
METHODS

- 16 semi-structured interviews and 2 focus groups with hospital-based providers, including ED physicians, pulmonologists, hospitalists and residents at one teaching hospital and one community hospital in New England.
- The interview instrument was informed by the Theoretical Domains Framework (TDF).
- Interviews and focus groups were audio-recorded and transcribed.
- Coded for themes using NVIVO 12

MAPPING INTENTION



Source: <https://www.nhlbi.nih.gov/news/2018/nih-statement-world-asthma-day-2018>



Click a question mark to view quotations!

Environmental Context

- Lack of time/resources/info
- Prescribing culture
- Patient expectation

Knowledge

- Use of guidelines
- Understanding AB side effects and resistance

Individual Provider Characteristics

- Clinical inertia
- Professional role
- Self-efficacy

Diagnostic Uncertainty

- Asthma vs COPD
- Bacterial vs viral

Reaction to Uncertainty

- Regret
- Restraint
- Consequences

Suggestions

¹Lindenauer PK, Stefan MS, Feemster LC, et al. Use of Antibiotics Among Patients Hospitalized for Exacerbations of Asthma. *JAMA Intern Med.* 2016;176(9):1397-1400. doi:10.1001/jamainternmed.2016.4050
²Stefan MS, Shieh M, Spitzer KA, et al. Association of Antibiotic Treatment With Outcomes in Patients Hospitalized for an Asthma Exacerbation Treated With Systemic Corticosteroids. *JAMA Intern Med.* 2019;179(3):333-339. doi:10.1001/jamainternmed.2018.5394

Knowledge

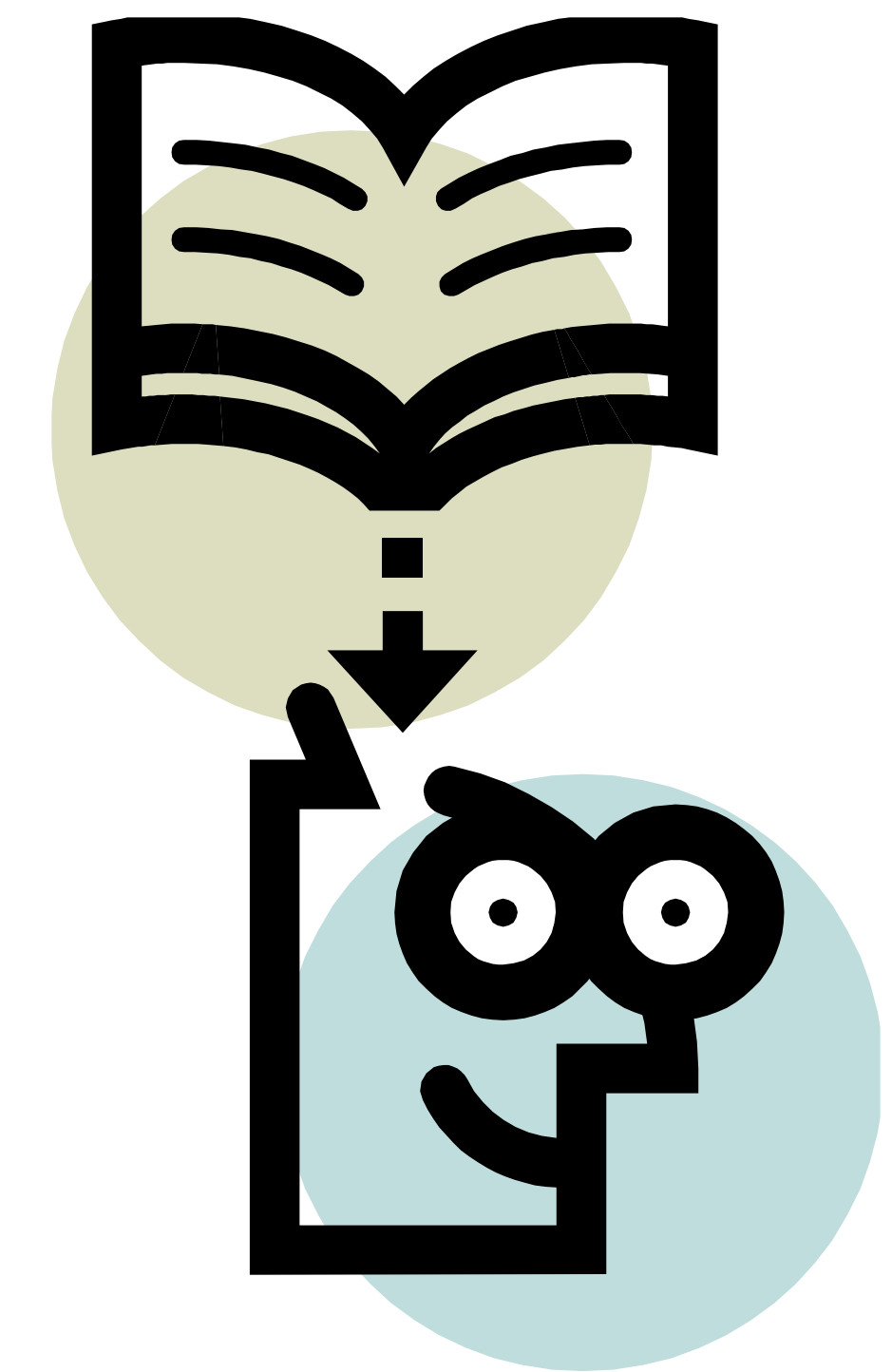
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*“So [a] potential harm is more resistant bacteria. It is both the case for the person and also the general public.” – **EM attending, teaching hospital, 0-5 years in practice***

*“Yeah, I think there is a bit of everything...I feel like we should be practicing under certain evidence-based guidelines. But I feel like if you’ve had more experience and you’ve seen more things that you’re kind of doing it based on that sometimes.” – **EM NP, teaching hospital, 0-5 years in practice***

*“I think guidelines are only for residency.” – **IM attending, teaching hospital, 6-10 years in practice***

*“I will basically do whatever we have learned over CMEs...and then we keep having updates coming on. Sometimes we end up having a consult coming on from pulmonary. You always get a teaching from your specialist also, based on the mix of things that you see.” – **IM attending, teaching hospital, 6-10 years in practice***



Individual Provider Characteristics

HOME

*If you are trained in a certain way of doing something, and you've been doing it for 20, 30 years, it's very hard to go back, unless you're someone who is more open to the idea of staying well-educated and up-to-date with the resources.” – **EM resident, teaching hospital***

*“Education works up to a point. But I've seen providers who are like, ‘This is the way I've always done it. I don't care what the literature says, this is the way I'm gonna do it.’” – **EM attending, teaching hospital, 6-10 years in practice***

*“I'm a believer as a former resident that residents can really push the program and push the practice of attendings.” – **EM attending, teaching hospital, 0-5 years in practice***

*“And they might tell you whenever I have this, my pulmonologist gives medicine. And I just see them for one time there, so I'd rather treat them as they're usually being treated.” – **IM attending, teaching hospital, 0-5 years in practice***



Reaction to Uncertainty

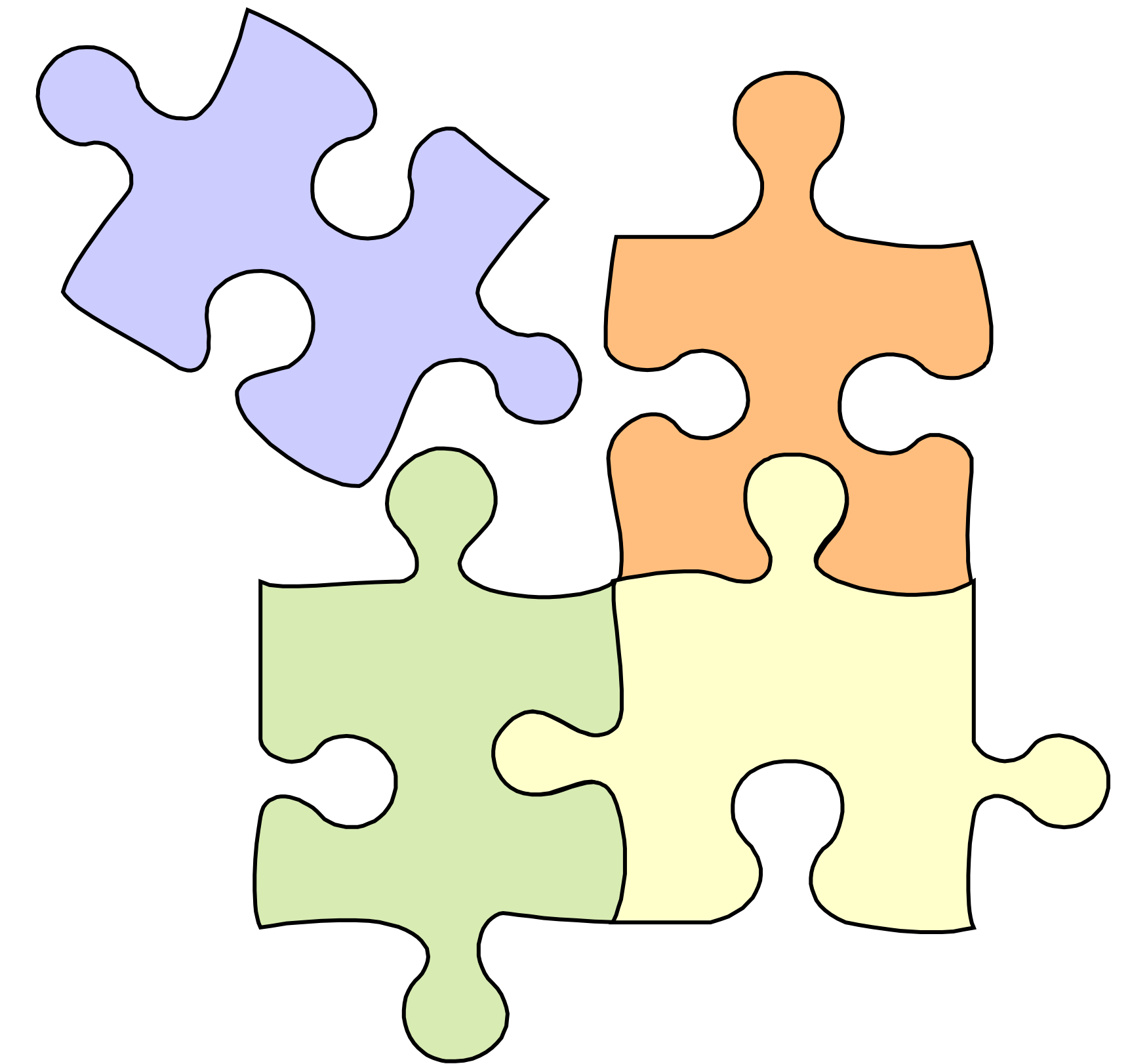
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*“I have had patients that come in frequently. If they’ve had more than two or four admissions in the past year and they keep coming back, I go back and look at if I gave antibiotics, would they be not readmitted this time?” – **IM attending, community hospital, 0-5 years in practice***

*“I don’t wanna miss him getting more sick, and it's coming back to me. So I'm just gonna give this. And if someone wouldn’t do any harm, but—and if it needs to do benefit, it'll do the benefit as well.” – **IM resident, teaching hospital***

*“The reason I did not give her – so, again, the other things influenced which I know that she had eczema too, I know it was more allergen induced. She had atrophy, she had eczema. In that cases, I will not give antibiotics. If she was somebody else, I would probably...” – **IM attending, community hospital, 6-10 years in practice***

*“No, I still don’t give 'em antibiotics. I think the -- the best things is gonna be albuterol. Mostly albuterol treatments. Sometimes I'll give them magnesium at times. But I -- I never give antibiotics to patients.” – **IM attending, community hospital, 0-5 years in practice***



Diagnostic Uncertainty

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*“I don’t blame clinicians if they can’t differentiate between COPD or early pneumonia and asthma.” – **Pulmonologist, teaching hospital, 6-10 years in practice***

*“Maybe they really have bronchitis or sinusitis, or maybe some touch of pneumonia because you know, in chest x-ray, you cannot see all the infiltrate. You seem them only on CAT scan and you do not wanna do all those CAT scans.” – **IM attending, community hospital, 6-10 years in practice***

*“Well, we’re supposed to give decisions based on what our best medical judgment is.” – **EM attending, teaching hospital, 16-20 years in practice***



Environmental Context

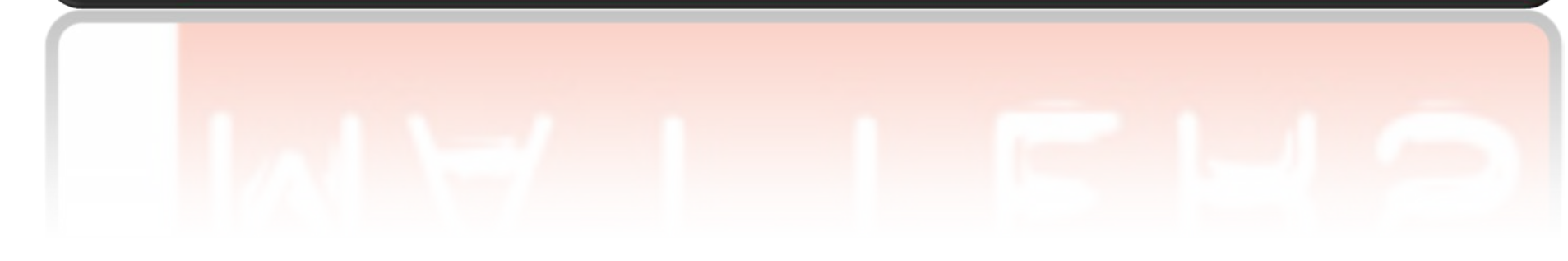


Time: “So the question is, is really less of antibiotics or not, it's can you afford to wait?” – **IM resident, teaching hospital**

Patient Expectation: “Yes, I mean it's just a factor, but usually it's a discussion, and I like to think it's shared decision-making.”
– **EM attending, teaching hospital, 6-10 years in practice**

Prescribing Culture: “And in our group, we're very open to getting things right. So if there's something we can do better, our docs are not kind of those docs that are just gonna say, ‘No, I'm doing it my way.’” – **EM attending, teaching hospital, 11-15 years in practice**

Prescribing Etiquette: “I certainly don't want to undermine that patient relationship.” – **IM attending, teaching hospital, 20+ years in practice**



Suggestions



Physician Education: *“I think there are certainly opportunities. I think, [it] might be as simple as education. I think that we get much more education on COPD patients than asthma...” – IM attending, teaching hospital, 0-5 years in practice*

Procalcitonin: *“So, there’s two things we don’t use in the ED Procalcitonin and TAG, for two reasons. One, it doesn’t change our managements fast enough. Procalcitonin takes too long, and then TAG takes too – it’s quick, but we don’t have access to it, so we don’t order those tests.” – EM resident, teaching hospital*

Audit and Feedback: *“I think it’s really important how you word it exactly, because it could be taken as punitive.” – IM resident, teaching hospital*

Pharmacist Review and Call: *“I think actually some of the pharmacy directives have been helpful in other things. For example, an intravenous antibiotic in hospital. You will often get a pharmacist reach out to you and say, look you know, is this indicated?” – IM attending, teaching hospital, 0-5 years in practice*

Order Sets: *“We’ve relied on order sets a ton. Sometimes they’re a pain to click through and stuff like that, I think that’s the number one way we get through things. It makes it accessible and easy.” – EM attending, teaching hospital, 0-5 years in practice*



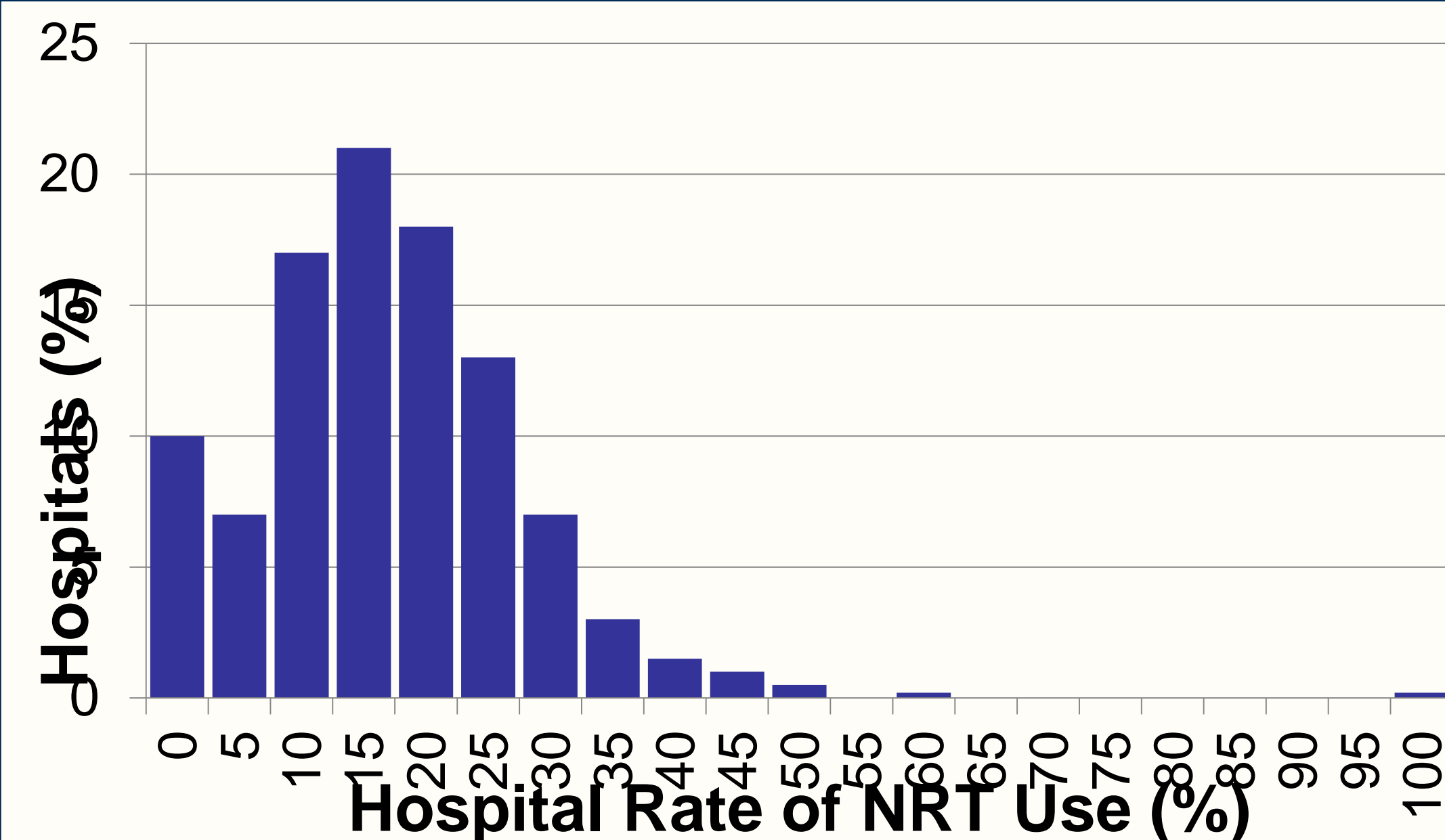
Introduction

- The Joint Commission considers inpatient smoking cessation counseling and smoking cessation medication prescription as standard of care
- Little is known about the use of smoking cessation therapies among hospitalized smokers undergoing surgical procedures in the United States

Methods

- We utilized data from 551 hospitals that participate in the Premier Alliance Data Warehouse in 2015-2016.
- Patients were active smokers and identified through use of ICD-9 and ICD-10 codes (ICD-9 CM code 305.1 & ICD-10 codes F17.2x; Z72.0; O99.33X)
- Patients were hospitalized for a surgical procedure which was expected to require length of stay ≥ 2 hospital days, per DRG codes.
- We used hospital pharmacy charges to measure use of nicotine replacement (NRT) including nicotine patch, gum, lozenge, and inhaler.
- We also evaluated use of varenicline
- Using a hierarchical generalized logistic regression, we identified factors independently associated with use of NRT during hospital days 1 and 2
- We used the median odds ratio (MOR) to quantify the impact of the hospital on a patient's chance of receiving smoking cessation medications.

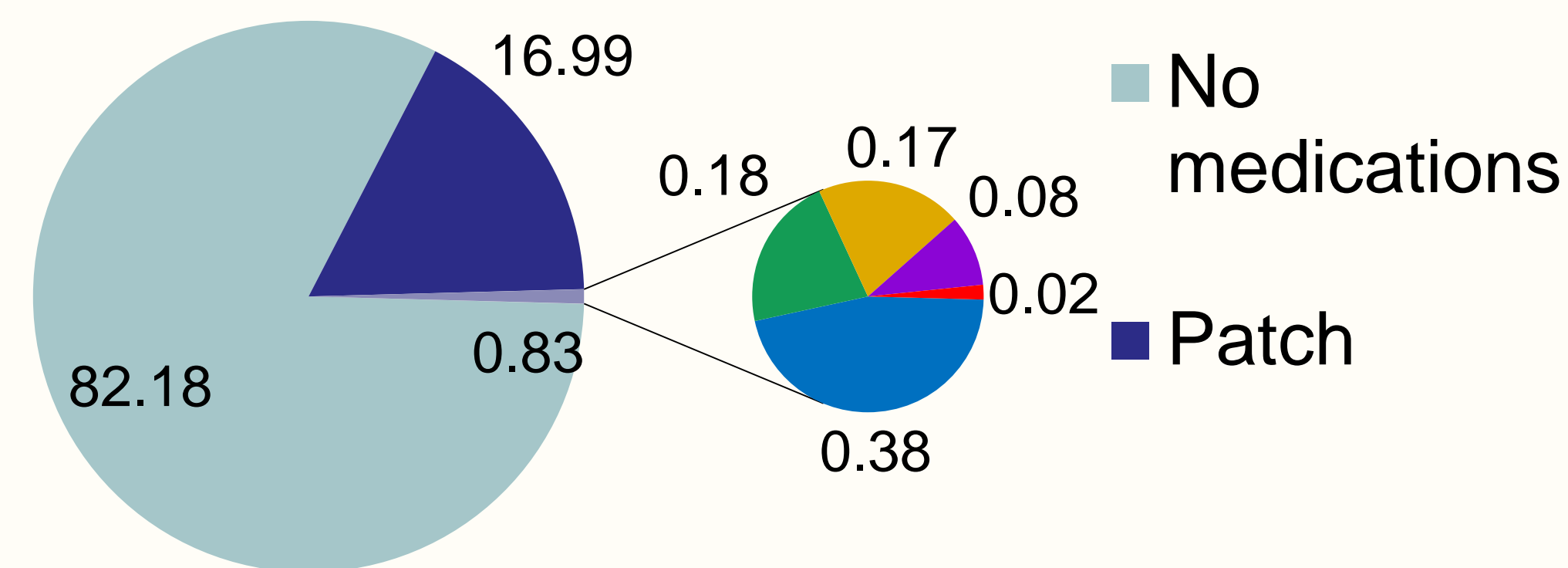
Hospital Variability in NRT Rates



Results

- Among 148,059 smokers, 26,381 (17.8%) received pharmacologic treatment for smoking cessation while hospitalized
- Median age (IQR) 56 (43 to 65) yrs; 51% female, 74% White; 51% elective
- The hospital was an important predictor of use of medications. (Figure)
- The most common therapy was the nicotine patch (17%) at a median daily dose of 21 mg/day. See Figure.

Use and Types of Medications (%)



Clinical Predictors of Treatment with NRT

	Category	OR (95% CI)
Age (tertiles)	18-44 y	1.6 (1.5, 1.7)
	45-64 y	1.6 (1.5, 1.7)
	≥ 65 y	Ref.
Male sex		1.0 (1.0, 1.0)
Race	White	Ref.
	Hispanic	0.6 (0.5, 0.6)
	Black	0.5 (0.5, 0.6)
	Other	0.7 (0.6, 0.8)
Admission Urgency	Elective	0.8 (0.7, 0.8)
	Emergent	Ref.
Alcohol abuse		1.7 (1.6, 1.8)
Chronic Lung Disease		1.5 (1.4, 1.6)
Drug Abuse		1.4 (1.3, 1.5)
Psychosis/Depression		1.3 (1.2, 1.3)
Obesity		0.8 (0.7, 0.8)
Renal Failure		0.7 (0.7, 0.8)
Hospital Impact		1.9 (1.8, 2.0)

NRT Use By Surgical Type

	Surgical Volume (%)	Patients with NRT (%)	OR (95% CI)
Orthopedic	35.5	23.7	Ref
Gastrointestinal	23.3	19.8	0.8 (0.7, 0.8)
Spine	7.6	16.0	0.8 (0.7, 0.8)
Vascular	7.0	21.3	1.0 (0.8, 1.0)
Thoracic	5.6	27.6	1.1 (1.0, 1.2)
Gynecology	4.9	15.1	0.6 (0.5, 0.6)
Neurosurgery	4.6	20.4	0.9 (0.8, 0.9)
Obstetrics	4.4	8.9	0.3 (0.3, 0.4)
Plastics	3.8	30.7	1.1 (1.1, 1.2)
Urology	2.7	17.8	0.9 (0.8, 0.9)
Endocrine	0.6	21.8	1.0 (0.9, 1.2)

hospitalized for a surgical procedure received any smoking cessation medications during their hospitalization

- Older age, non-white race, elective admission, alcohol abuse, and chronic lung disease were associated with less frequent NRT use
- The strongest predictor of treatment with NRT was the hospital where the patient received their care.
- These findings may be due to differences in hospital policies, physician inexperience with prescribing smoking cessation medications, and lingering concerns about the impact of NRT on wound healing after surgery
- This study is limited by lack of information about if patients were offered medications and refused them.
- Use of medications before or after hospitalization is also unknown.
- Given that hospitalization is usually a teachable moment with high patient motivation to quit smoking, there appears to be a large opportunity to improve the care of hospitalized patients who undergo surgery

Funding and Conflicts of Interest

All authors have no conflicts of interest. Dr. Pack, Dr. Stefan and Dr. Lindenauer were each supported by grants from the National Heart, Lung and Blood Institute of the National Institutes of Health of Bethesda, MD under award numbers 1K23HL135440, HL11463104 and 1K24HL132008 respectively.

Spirometry Utilization in an Urban Health Center

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BACKGROUND

Asthma, a chronic inflammatory disorder of the airways that is characterized by variable airflow obstruction, bronchial hyperresponsiveness and underlying inflammation, affects an estimated 39.5 million people, including 10.5 million children in the United States¹.

An expert panel of clinicians and researchers assembled by the National Asthma Education and Prevention Program (NAEPP) has recommended that spirometry be performed for all patients in whom the diagnosis of asthma is being considered, including children >5 years of age³.

Failure to use spirometry as part of the making an asthma diagnosis can lead to either a missed diagnosis or a false diagnosis of asthma⁴, either of which may lead to increases in likelihood of ER visits and inappropriate medication prescriptions. Still, spirometry is widely underutilized. It has been suggested that, compared to high-income and white patients, low-income and nonwhite patients are less likely to receive spirometry, even though this group has traditionally high rates of health care utilization related to asthma^{5,6}. We aim to describe use of spirometry in a population where fewer than 50% of the patients were white and many were low income. We examined use of spirometry both diagnosis and follow up and identified predictors of spirometry for this population.

METHODS

Design & Study Population

We conducted a retrospective cross-sectional/prevalence study of adult patients who had a diagnosis of asthma and an appointment at High Street Health Center in 2014. We used the International Classification of Diseases (ICD)–Ninth Revision, to identify a range of asthma diagnoses. We excluded patients diagnosed with neuromuscular conditions and any history of pneumonectomy for the sample.

Outcomes

Our primary outcome was the percentage of patients with asthma who received spirometry in their initial diagnosis of asthma as well as the percentage of patients with confirmed asthma who received spirometry at least once in the follow up management. We further examined characteristics of the testing, including use of the methacholine challenge.

	Spirometry Performed			P-value
	Overall	No	Yes	
	n = 394	N = 186	N = 208	
Age, Median (IQR)	51.0 (42.0, 60.0)	49.5 (39.0, 59.0)	53.5 (45.0, 62.0)	<0.001
Race/Ethnicity				
White NH	188 (47.7%)	93 (50.0%)	95 (45.7%)	0.05
Black NH	43 (10.9%)	19 (10.2%)	24 (11.5%)	
Hispanic	154 (39.1%)	66 (35.5%)	88 (42.3%)	
Insurance				
Private	144 (36.5%)	77 (41.4%)	67 (32.2%)	0.04
Medicare	84 (21.3%)	33 (17.7%)	51 (24.5%)	
Medicaid	135 (34.3%)	57 (30.6%)	78 (37.5%)	
Current Medication Classes (SD)	1.7 (0.9)	1.5 (0.8)	1.5 (0.9)	<0.001
Prior Visit with Pulmonologist /Allergist?	97 (24.6%)	9 (4.8%)	88 (42.3%)	

DISCUSSION

Despite existing guidelines that recommend spirometry use for all diagnoses of suspected asthma³ we found that spirometry is underutilized in primary care for both the diagnostic evaluation and subsequent monitoring of asthma. Among those who did receive spirometry, diagnostic tools such as the methacholine challenge, were rarely used. The chance of receiving spirometry was strongly associated with seeing a specialist: half of those who received spirometry saw either a pulmonologist or allergist underwent spirometry at any time during the study period; only 5% of those who did not receive spirometry ever saw a specialist. There are potential barriers to routine spirometry utilization such as the cost of the machine, lack of time, low remuneration, lack of proper training, and limited staff⁷. Future studies should focus on identifying the specific types of barriers that general practitioners in this urban health center face in ordering spirometric tests and how these can be addressed.

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