Published in final edited form as:

Heart Lung. 2016 ; 45(1): 70–78. doi:10.1016/j.hrtlng.2015.11.002.

Changes in clinical conversations when providers are informed of asthma patients' beliefs about medication use and integrative medical therapies

Maureen George, PhD, RN, AE-C, FAAN [Associate Professor],
Columbia University School of Nursing, mg3656@cumc.columbia.edu

Sarah Abboud, PhD, RN [Postdoctoral Fellow],
University of Pennsylvania School of Nursing, abbouds@nursing.upenn.edu

Michael V. Pantalon, PhD [Assistant Clinical Professor],
Yale University Department of Psychiatry and Department of Emergency Medicine, School of Medicine, michael.pantalon@yale.edu

Marilyn (Lynn) S. Sommers, PhD, RN, FAAN [Lillian S. Brunner Professor of Medical-Surgical Nursing],
University of Pennsylvania, ssommer@nursing.upenn.edu

Jun Mao, MD, MSCE [Associate Professor], and
University of Pennsylvania Perelman School of Medicine, jun.mao@uphs.upenn.edu

Cynthia Rand, PhD [Professor]
Johns Hopkins University School of Medicine, crand@jhmi.edu

INTRODUCTION

As many as 82% of adolescents and adults with asthma have uncontrolled disease,¹ defined as an asthma exacerbation requiring a hospitalization or burst of systemic steroids, frequent symptoms, activity limitations, declines in lung function or need for “step-up” therapy. Minorities are disproportionately represented within the asthma population; more than 24 million Americans have asthma and prevalence is higher among non-Hispanic Blacks (11.1%) and those living below the poverty level (11.6%).² Adults die at 6 times the rate of children and Blacks die at nearly twice the rate of Whites.² Asthma control can be defined as “the extent to which the various manifestations of asthma have been reduced or removed by treatment”³. These include minimal or no symptoms, optimal pulmonary function, few/no exacerbations, and the ability to carry out activities of daily living and achieve optimum quality of life.³ The economic cost of uncontrolled asthma is very high despite asthma control being achievable by adhering to a multifaceted treatment plan that includes trigger

Corresponding Author: Maureen George PhD, RN, AE-C, FAAN, Columbia University School of Nursing, 630 West 168th Street New York, NY 10032, mg3656@cumc.columbia.edu, Phone: 212-305-1175.

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

remediation and avoidance, self-monitoring guided by asthma action plans, regular follow-up and pharmacologic management, including inhaled corticosteroids (ICS) for persistent disease.^{4,5} Among the many reasons contributing to poorer asthma control, one is more common in Black adults than in other groups: lower rates of inhaled corticosteroid (ICS) adherence.^{6–9}

ICS treatment, part of the multifaceted treatment plan, is largely effective in achieving and maintaining control of persistent asthma in the vast majority of individuals with persistent disease.¹⁰ While ICS adherence is estimated at 50% across all populations,¹¹ ICS adherence has been reported as low as 29% in Black adults.⁷ Personal beliefs about asthma and its pharmacologic treatment are among the most significant factors affecting ICS adherence, particularly in the Black community.^{8,12–14} For example, negative ICS beliefs (e.g., skepticism about the need for ICS, concerns about side effects or addiction risk) have been found to partially mediate the association between minority status and ICS use.¹⁵ In addition, lower rates of ICS adherence have also been identified in patients endorsing integrative medicine (IM) for asthma.^{16–18} IM includes “the array of health care approaches with a history of use or origins outside of mainstream medicine”¹⁹ commonly referred to as alternative (*in place of*) or complementary (*in addition to*) medicine. For example, Black adults commonly employ prayer and culturally-relevant home remedies^{20–21} to replace ICS or to augment a patient-directed reduction in ICS dose.^{16–18}

Clinical outcomes might be improved in asthma if providers had knowledge of these important and potentially modifiable beliefs that may contribute to ICS non-adherence. However, most adult asthma care is delivered by primary care providers during visits lasting <15 minutes²² making it difficult, if not impossible, to identify potential obstacles to the medical plan. This speaks to the pressing need for novel brief interventions that engage patients in their own self-care decision-making.

Patient-provider shared decision-making communication is one critically important component of quality care that may be useful for facilitating mutual understanding and partnering that improve clinical outcomes in chronic conditions, such as asthma.^{23–26} Patients rate communication as one of the most important skills a provider can possess.²⁷ Effective communication enhances providers’ understanding of patient preferences and uncovers possible treatment misconceptions. Providers using enhanced communication skills, in which the patient is actively involved in the final decision regarding the course of treatment, saw better patients’ outcomes^{28–30} including greater IM disclosure³⁰ and ICS adherence in adults.³¹ Shared decision-making is described as a “deliberation and is interactional in nature” (p.16).³⁰ Unfortunately, patients infrequently discuss their IM use with their providers^{32–34} believing their decision to use IM will be misunderstood³⁴ or that providers are uninterested in IM³⁵ or lack meaningful IM knowledge.^{34,35} In turn, providers may not query patients creating, in essence, a de facto “don’t ask, don’t tell” policy^{32,34} which leaves the provider inadequately prepared to screen for, or to respond, to patient disclosures. However, identifying negative ICS beliefs or IM use could provide a critical opportunity for a patient-provider interaction that helps align treatment goals.³⁶

Aims

The aim of this study was to explore the content of clinical conversations at routine primary care visits when providers did or did not have knowledge of their patients' use of IM and their personal beliefs about asthma self-management including ICS.

Design

A qualitative descriptive study design using audio recordings of the primary care visits was employed to explore the content of the clinical conversations between the patients and their primary care provider. Qualitative descriptive design is the method of choice when the purpose of the study is description of a phenomenon.³⁷

Setting and sample

We enrolled a convenience sample of 43 participants (patients and providers) from three unrelated primary care sites: two internal medicine group practices and one federally-qualified health center (FQHC). Providers from these sites were recruited from a parent study (Blinded reference) and were considered eligible for enrollment if they were either a medical doctor or a nurse practitioner responsible for the care of a panel of adults with persistent asthma (i.e., those requiring ICS therapy). Patient participants were either identified by their primary care providers or self-referred into the study in response to posted flyers. Inclusion criteria for patients included age ≥ 18 years and prescribed ICS for provider-diagnosed persistent asthma. Exclusion criteria included inability to speak English or to understand the informed consent process. By signing informed consent both providers and patients agreed to provide demographic data and to have their primary care visit audio recorded for the purpose of learning more about how providers and patients talk about asthma self-management. Patients received a \$50.00 cash incentive and transportation tokens to defray travel-related costs and providers received a prepaid debit card after data collection was complete.

Asthma Control

Asthma control was calculated by using standard patient-reported outcomes that are recommended by the national guidelines:⁴ the number of short-acting β_2 -agonist (SABA) doses in the prior 7 days, the number of night-time awakenings caused by asthma in the prior 30 days, or both. Participants were categorized as having controlled asthma (SABAs <2 days per week and/or awakenings <2 times per month), or uncontrolled asthma (SABAs >2 days per week and/or awakenings 1–3 times per week, or SABAs several times a day and/or awakenings >4 times per week). Control categorization was determined during analysis and was not available at the time of the visit.

IM endorsement and negative ICS belief assessment

The 17-item *Conventional and Alternative Management for Asthma (CAM-A)* survey is a brief self-administered screening tool with low literacy demands (Blinded Reference)³⁸ that has undergone rigorous psychometric development, testing and refinement (Blinded Reference)³⁹. The CAM-A identifies two barriers to ICS adherence: negative ICS beliefs and

IM use for asthma; the IM endorsement subscale score is significantly associated with uncontrolled asthma.

Procedures

To determine what constituted typical communication between patients and providers during routine primary care visits for asthma, we audio-recorded the visits. In a non-random assignment, patients completed the *CAM-A* instrument either before or after routine clinic visits. When providers first enrolled, the *CAM-A* was administered after the visit. This ensured that the conversation was typical of routine visits for asthma. If the provider participated a second time, the *CAM-A* was administered prior to the visit. When this occurred, trained research assistants (RAs) (pre-med and nursing students) shared a simple written summary of the *CAM-A* results with the providers in the patient's presence: 'your patient endorses IM for asthma yes/no' and 'your patient has negative ICS beliefs yes/no'. Additional detailed information was available to the provider although reviewing these details was optional. The RA did not give the provider any instruction as to what to do with this information. Similarly, patient participants were not given any instruction by the RA.

Providers were allowed to participate a maximum of six times; patients only once. If providers participated more than twice, the pattern of alternating the *CAM-A*, either before or after the visit, continued. For example, the *CAM-A* was administered after the first, third, and fifth visits and before the second, fourth, and sixth visits. When providers participated more than once, visits were spaced out over several weeks (on average 23 days) to reduce contamination from previous exposure.

All visits were digitally audio-recorded; RAs were not in the room during clinic visits. The transcripts of these audio recorded visits were the source material for this qualitative analysis. Data collection occurred between May and December 2012. A report of the psychometric development, testing and refinement of the instrument, as well as a descriptive analysis of the 3-item debriefing survey given to both the provider and the patient, separately, immediately after each visit, has been reported elsewhere.³⁹

Ethical considerations

The study was approved by the Institutional Review Boards (IRB) of two participating institutions; one institution's IRB served as the IRB of record for the FGHC. Confidentiality and anonymity of all participants, patients and providers were protected.

Data analysis

Content analysis with an inductive process was used. This analysis approach has been widely used in nursing research and is recommended when there is not enough previous knowledge of the topic⁴⁰ and is the analysis strategy of choice in qualitative descriptive studies.³⁷ The audio recorded interviews were transcribed verbatim and coded in ATLAS software (atlas.ti.6.2) (www.atlasti.com). After several readings of the first four transcripts, a coding guide was developed by one of the authors and was used for the remaining analysis. A second investigator then reviewed the codes. Differences in coding were

resolved by discussion until consensus was reached between the coders. Demographic data and debriefing survey data were analyzed in Microsoft Excel (Microsoft Office, 2010).

Rigor

The rigor⁴¹ of the present study followed the qualitative research rigor standard during data analysis. The contents of the recordings of the primary care visit were confirmed twice (by a RA and one of the authors) to ensure the credibility of data. The analytical procedure was followed strictly and was peer-reviewed by the different authors to assure dependability and credibility of the data analysis. To enhance dependability, an audit trail was created to record activities performed by the research team over time. The audit trail also served in maintaining confirmability by illustrating as clearly as possible the process that led to the conclusions. The present study used purposive sampling to ensure the range of the participants and improve the transferability of the data.

Results

A total of 33 encounters were analyzed including 10 providers (5 physicians and 5 nurse practitioners) (Table 1) and 33 patients (Table 2). Most provider subjects and patient subjects were female (97% and 80%, respectively). Of the 33 patient subjects, 26 (79%) had uncontrolled asthma. The length of primary care visits ranged from 9 to 50 minutes with a mean of 23 minutes in each group. At 15 of the 33 visits (45%), providers were given the written summary of whether their patient held negative ICS beliefs and/or endorsed IM for asthma (yes/no) prior to the audio recorded visit. At 18 visits the *CAM-A* was administered after the audio recorded visit and debriefing. At these visits, providers never received a summary of their patients' responses. Providers participated in the study between one and six times (Table 1), averaging 23 days between visits when participating more than once. Patient subjects participated only once.

IM endorsement and negative ICs beliefs

IM endorsement was similar in both patient subject groups: 95% of subjects who completed the *CAM-A* after the visit used IM for asthma compared to 93% of subjects who completed the *CAM-A* prior to the visit. Further, there were no statistically significant differences between groups on negative ICS beliefs: 67% of patient subjects who completed the *CAM-A* after the visit held negative beliefs compared to 86% of patient subjects who completed the *CAM-A* before the visit.

Qualitative content analysis of the audio recorded primary care visits

According to protocol, at half of the visits (15/33) providers were given patient's reports of negative ICS beliefs and/or IM endorsement (yes/no) immediately before the visit ("provider had knowledge of patient's beliefs"). Four themes emerged from the analysis of these transcripts: *negative ICS beliefs*, *IM use for asthma*, *decision-making* and *healthy lifestyles*. In 18 visits, the *CAM-A* was not administered until after the visits and debriefings ("provider did not have knowledge of patient's beliefs"). Two themes were identified from the transcripts of these visits: *asthma self-management* and *healthy lifestyles*.

Themes identified when the provider had knowledge of patient's beliefs

Negative ICS beliefs—A prominent theme that emerged from the analysis pertained to negative ICS beliefs, including fears of developing tolerance or addiction to ICS with regular use, fear of being overmedicated, and concerns about medical experimentation. Others expressed fears of systemic side effects despite its topical administration, or made attribution of serious side effects (e.g., cancer, infertility) to ICS that are not associated with corticosteroids. When providers were informed that the patients had negative ICS beliefs, they focused the conversations around ICS. The following is an example from one visit in which the provider discovered that the patient had not taken their prescribed ICS and had suffered an asthma attack:

Provider: But you...didn't take steroids, because?

Patient: Because it's evil and I didn't need it, clearly. I clearly didn't need it.

Provider: It's not evil. It's not evil.

In another visit, the provider learned that the patient had decreased twice daily ICS doses to once daily, fearing tolerance:

Patient: Well here's the thing, I won't want to be like...immune to it.

Provider: To what?

Patient: To the [brand name ICS]. So I take it once a day. So I think when I start getting worse, I'll start with twice a day. You see what I'm saying?

Provider: 'Cause you don't want to build up a tolerance to the [brand name ICS]?

Patient: Right. I don't want to [...] I don't take it at night. A lot of times at night I find myself wheezing.

Provider: Okay. Who told you that you would get a tolerance to it?

Patient: Me.

Provider: Okay.

Patient: No one. Is that true?

Provider: No. So you should take it twice a day.

Other patients associated symptoms such as “fingers or stomach cramps” to side effects of corticosteroids and providers tried to correct some of the misconceptions or negative ICS beliefs. Conversations regarding negative ICS beliefs were very brief for most providers:

Provider: Did they give you steroids?

Patient: Yeah, they gave me the Prednisone.

Provider: Yeah.

Patient: And that stuff, I think I'm having side effects from that.

Provider: From back then?

Patient: Yeah, 'cause my body cramps and like I still... my body is still... my muscles still will cramp up.

Provider: Hum.

Patient: Like I might go to bed and turn and my stomach muscles are just... they'll just grab. Sometimes it's in my feet. Sometimes my fingers cramp up and I never had it until I took those.

Provider: Prednisone doesn't usually do things like that, but I'm wondering if there are other reasons...

IM use for asthma—In our analysis, providers who had knowledge of their patients' use of IM for asthma symptoms asked questions about IM endorsement and patients disclosed IM use. IM included drinking water, tea or black coffee, inhaling steam or getting fresh air, as well as using topical chest ointments or praying for symptom relief. For example:

Provider: So do you do some of these things sometimes, when your asthma's acting up?

Patient: Yeah, I turn the fan on. I sleep with the fan on...If there's a breeze blowing through the window, I don't need the fan. Then I'm okay, but it does help. And my mom used to always tell me that coffee helped [control asthma symptoms].

Provider: Yeah, there's something in coffee that works similar to, have you ever heard of theophylline? It's a really old asthma medicine.

Another patient also described the use of the fan to help with asthma symptom relief:

Provider: So do you use fans in your house?

Patient: I have a ceiling fan.

Provider: Does that make your breathing worse?

Patient: Oh, I love my ceiling fan.

Provider: Okay.

Patient: And I have a standup fan.

Provider: You use the ceiling fan at night?

Patient: Uh-huh, all the time.

Similar to discussions around negative ICS beliefs, providers addressed IM use for asthma very briefly, mostly identifying the type of IM the patients were using and not necessarily discussing the rationales for their use.

Decision-making—Providers discussed patient self-management decision-making to gain a better understanding of the thought processes involved in selecting prescription medicine or culturally-relevant IM for asthma. An exemplar follows.

Provider: How often are you getting asthma attacks?

Patient: Attacks? Not necessarily...

Provider: So you are preventing a full [attack]?

Patient: I would lay there and think, yeah, maybe it will pass. And then I took a bath and maybe the steam and everything would work. And I had to use my nebulizer.

This example illustrates the thought processes that the participants engage in when faced with - acute asthma symptoms and how they prioritize their treatment decisions at the time of the acute symptoms. For this participant, laying down and waiting for the symptoms to pass was the first choice, followed by taking a bath in hope that the steam will help. When the participant realized that the symptoms were not improving, she decided to use the nebulizer. In another visit, the provider discussed and reinforced the management of asthma medications to better control symptoms. The provider discussed with the patient how to decide on which medication to use and their benefits (as needed versus continuous use):

Provider: Right. Okay. So if taking a deep breath bothers you, or you cough more, or you feel short of breath, right...

Patient: (Interrupting) Right.

Provider: So you got some medicines to take that could help you...

Patient: (Interrupting) Right.

Provider: Only one of them is as needed.

Patient: I don't know, which one, that purple one?

Provider: Not the purple one. That's not as needed.

Patient: Oh.

Provider: The other, albuterol.

R: Albuterol.

Provider: Puffer, that's the as needed one.

Patient: Okay.

Provider: But you don't use that too much?

Patient: No.

Provider: No? Okay, well that's good. But how about the Advair?

Patient: I use it when I'm... I can't sleep 'cause of coughing, it's like something's tickling my throat and I can't get it out.

Provider: So that's not how it was prescribed, right?

Patient: No.

Provider: No. [Laughing] Okay, one puff two times a day, remember?

Patient: Oh, two times a day, okay.

Provider: Yeah, remember, one puff two times a day?

Patient: I remember now, one puff two times a day.

Provider: Okay. That medicine doesn't work as needed. It's got to be in your system for a couple days before it even works for you.

Healthy lifestyles—Providers also discussed conventional non-pharmacologic approaches to improved asthma control, including diet, weight loss, exercise, and smoking cessation. Discussions were tailored to patients' needs, situation, and their ability to modify certain behaviors like smoking:

Provider: So you always tell me you feel short of breath, right?

Patient: Right.

Provider: Okay. You're also still smoking, right?

Patient: Yeah.

Provider: How much? How many cigs?

Patient: Five cigarettes.

Provider: Five? Oh, that's good.

Patient: Five cigarettes until I get stressed out.

Provider: And well that's every day.

Patient: Well I don't smoke... I'm not a... I'm like a casual smoker, 'cause I can go all day without smoking a cigarette.

Provider: Good. So how about, you know... the cigarettes are an irritant, the smoke, even if you don't believe anything about nicotine, okay?

Patient: Right.

Provider I: The inhaled smoke and the burning of the paper and the burning of the leaves, no matter what kind of leaves they are.

Patient: Okay. Okay. [Laughing]

Provider: Alright?

Patient: Okay.

Provider: It goes down into your lungs and you're the one who's telling me you're short of breath, unless you like feeling that way.

Themes identified when the provider did not have knowledge of patient's beliefs

Asthma self-management—Analysis of these transcripts found that patient-provider communication focused primarily on the ability to manage the disease through a review of prescribed asthma medications and emergency procedures, such as when to call the office, as well as inquiries about recent symptoms and need for acute care.

Example 1:

Patient: Well I don't know what I'm allergic to, but... my pulmonary doctor told me that sometimes if I get postnasal drip...

Provider: Yeah.

Patient: It affects my asthma.

Provider: Right. So what do you do about the postnasal drip when you get it?

Patient: I'm using my [brand name prescription intranasal steroid].

Provider: Okay. Are you using it every day?

Patient: Sometimes. It dries me up.

Example 2:

Provider: And then how is your breathing, how's the asthma doing right now?

Patient: It's doing okay right now. But, like last month, I had a few problems. Like at night time, bedtime, with breathing. But I got on the nebulizer, you know, and I started, you know, taking my [brand name ICS] twice a day instead of once a day and then it seemed like it kind of, like, disappeared. I just had, like, that cough. I had a problem with, like, the cough thing. So I just got some cough medicine over-the-counter.

Example 3:

Provider: Okay. Alright. Now tell me about your asthma.

Patient: This has been acting up...

Provider: (Interrupting) Since last week.

Patient: Yeah, last week. It's been acting up a little bit, like um... well it... you know what, it's reoccurring ...

Provider: (Interrupting) So I'm just going to go back to last week, so last week you had just finished the steroids that were prescribed before...

Patient: (Interrupting) Yes.

Provider: And you had just finished the antibiotic (inaudible).

Patient: Right. Oh, that cleared up the cold real good.

Provider: Okay. So the steroids and the antibiotic, you felt better after that, right?

Patient: Felt normal after that, yeah.

Provider: And you were still coughing a little bit?

Patient: Yeah, I'm still coughing. I don't know why.

Provider: Okay.

Patient: I even took the cough syrup you gave me every night.

Provider: Okay.

Patient: And I'm coughing hard-like and then it's like a dry cough.

Provider: Okay. So you're coughing at night.

Patient: Yeah. Yeah, I'm still coughing. I don't know why.

Provider: But what's coming up?

Patient: Nothing.

Provider: Nothing? It's clear?

Patient: It's clear because of the antibiotics.

Provider: So clear, okay.

Patient: It's just clear, but it's hard and it lasts like a long time.

Provider: So it's a hard cough, okay. How many times are you using your rescue inhaler? I'm going to look at your sheet (inaudible).

Patient: My rescue inhaler I used like maybe twice. Sometimes... now I sleep with it.

Provider: Twice in?

Patient: Twice a day.

Provider: Twice a day, okay.

Patient: But I do my treatments, you know, one at night and one at bedtime, you know, one in the morning and one at night.

Healthy lifestyles—Another common theme was healthy lifestyles. Providers addressed these topics as part of chronic disease management that included asthma, diabetes, hypertension, cardiac problems, back pain, and other conditions.

Provider: I had really wanted you to focus on losing some weight to kind of help with everything. Really, help with the back pain, help with the breathing. And good job! You did that. Because last time I saw you, you were at 279. And today, when she weighed you...you were 267. So great job! That's 13 pounds [*sic*]. That's great. That's great. Because that's going to help, that's going to help with the back pain, that's going to help with the breathing, you know? So that's a great job. And, what have you been doing with that, you just been cutting back? A little bit? Not trying to eat as much?

Patient: I've kind of lowered my sugar intake with beverages because I had a thing with the beverages. You know like cut down off of that, even cut down on the sugar that I put in my coffee and stuff like that.

In another visit, the provider discussed diabetes control with the patient:

Patient: My sugar went to 300, I had spaghetti this morning and coffee.

Provider: How much spaghetti?

Patient: Serving.

Provider: Yeah, did you take insulin?

Patient: Four.

Provider: Four?

Patient: Four...

Provider: Before, good.

Patient: Yeah and a cup of coffee.

Provider: What was in your coffee?

Patient: Equal... substitute Equal.

Provider: Good, perfect. So you did 90 units before eating?

Patient: Yeah, right when I woke up this morning it was 262, what did I have last night, I think I might have eat some... I eat a cup of fruit and it wasn't (inaudible cannot hear patient over typing). But I brought my thing in.

Provider: Oh you did, oh good, I want to see it okay. Nice, nice, nice. You had a 103, you had a 167, those are good, 192, your sugars are better than they used to be Lilly, by a lot, by a lot. Look at the dinner ones before 170, 141, 130, 160; that's perfect. That's great, that's really, really great, so whatever you were doing... oh and that was the week of Thanksgiving, so the week of Thanksgiving your sugars were perfect.

Discussion

Transcripts showed that when providers had knowledge of their patient's IM endorsement or negative ICS beliefs, providers initiated conversations about these important and potentially modifiable beliefs that may contribute to ICS non-adherence. Visits in which these discussions took place were no longer than the visits with providers who did not have knowledge of their patient's IM endorsement or negative ICS beliefs. We also found high rates of endorsement for culturally-relevant IM for asthma and negative ICS beliefs and high rates of uncontrolled asthma among patients. These findings are consistent with other studies in both minority adults^{14–17,42–44} and children with asthma.^{45–48}

With the correct use of prescription long-term control medicines, such as daily use of ICS, a significant number of asthma attacks and other complications are preventable.⁴ Although there are many obstacles to ICS use,^{8,9} personal beliefs about pharmacologic treatment are among the most significant factors affecting adherence^{8,9,11–13}. Reservations about the use of ICS were common in this study and included the fear of being overmedicated or developing tolerance to, or addiction from, regular ICS use, the attribution of serious side effects to ICS that are not associated with this class of drugs and concerns that ICS was a form of medical experimentation. Negative ICS beliefs were not the only potential barrier to ICS use in this study; patients also endorsed unconventional approaches to managing their asthma, such as the ingestion of water and black coffee. Researchers have reported that IM offers patients the opportunity to tailor a personalized treatment plan to their own needs.⁴² Patients also characterize IM as both a natural and effective^{17,42,46,47} alternative to perceived "unsafe" prescription ICS therapies that patients believe carry the risk of addiction,^{46,49} systemic effects (e.g., weight gain) and serious adverse consequences (e.g., cancer, infertility).^{17,42} Patients also question providers' motives for prescribing these therapies.⁵⁰ In low-income populations, IM use may offer an alternative to costly conventional prescription medicine. Conversely, IM may represent a bias towards cultural traditions, a preference formed, in part, in response to a minority group's unique social experiences with institutionalized racism or culture-bound traditions.^{51,52} What is clear is that lower educational attainment in the context of IM endorsement, as seen in this study,

has been associated with uncontrolled asthma. The likely mechanism for this is poor adherence due to limited health literacy.³⁹

Negative ICS beliefs and preferences for IM contribute, in part, to the marked inequities that Black and poor adults experience in asthma outcomes. Improved disease control is possible with greater ICS adherence. However, most adult asthma care is delivered by primary care providers during visits lasting <15 minutes²² making it difficult, if not impossible, to identify potential obstacles to the medical plan. Providers require not only the time to identify these potential causes of treatment failure, they need new training and resources to address patients' deeply-held culture-bound beliefs and to uncover patients' hidden self-care practices.

Some of the provider's needs in this study were clearly identified in this analysis. When providers operated without *a priori* knowledge of their patients' beliefs and preferences, visits were characterized by standard biomedical approaches, such as review of system questions. However, when providers had knowledge of their patient's IM endorsement and negative ICS beliefs the visit became less disease-focused and more behavior- and/or education-focused. Interestingly, providers were also more likely to discuss ICS beliefs than IM endorsement, perhaps reflecting the providers' low self-efficacy in this area. This is similar to other findings in which providers avoided IM discussions because they did not feel knowledgeable and confident about IM.^{32,34,53} Without training in IM and in effective communication techniques it is also unlikely that providers will be able to effectively negotiate with patients who use IM as a replacement for ICS. These communication techniques are based on a shared decision-making approach, a collaborative and honest approach that encourages both providers and patients to share relevant information, explore alternatives options for treatment such as IM, express treatment preferences, and mutually agree on the treatment to implement.³¹ Ample evidence demonstrates that when health care professionals are trained to engage in discussions characterized by a shared decision-making approach, patient-provider differences can be reconciled, leading to mutually agreed upon higher quality decisions that best match patients' needs with evidence-based guideline recommendations.^{23,24,31,54}

It is worthwhile to note the limitations of this study. Small non-random subject pools do not allow for comparisons typical of quantitative approaches although they allow for the development of hypotheses that can be explored in future interventional studies. A convenience sample of patients and providers likely introduced selection bias in that only the most confident providers may have allowed their clinical visits to be recorded and only the most engaged patients may have enrolled. Generalizability is limited in that most of the subjects were Black women. However, this is a particularly important group to study as women have a 30% greater mortality rate from asthma than men and Blacks have death rates from asthma two times higher than whites.⁵⁵

Other limitations include the likelihood that audio recordings created a Hawthorne effect; discussions of guideline-recommended asthma care dominated these visits and may not be typical of primary care visits. Alternatively, because of the differences in small non-randomized samples, differences in conversations may not have been related to the CAM-A

but rather to inherent differences in the groups. Providers were also allowed to participate more than once, introducing the risk of contamination. To reduce this risk, we instituted a wash-out period of approximately three weeks between visits. This appears to have been sufficient in that IM was brought up by a provider only once at a visit in which the provider did not have knowledge of the patient's IM endorsement; negative ICS beliefs were never discussed at visits without providers having prior knowledge. Lastly, a more standardized approach to assessing asthma control, such as the Asthma Control Test, would improve characterization of patients' level of asthma control.

Despite data that point to the critical need for enhanced asthma self-management to achieve asthma control and reduce attacks, we continue to see exceedingly high rates of uncontrolled asthma in minority adults. The role of IM and negative medication beliefs is rarely considered in adherence studies despite the evidence that they pose formidable barriers to prescription medicine use in asthma and contributes to uncontrolled asthma.^{16–18,39} When patients are involved in decision-making, they may be motivated to commit to a treatment that relieves them of troubling or disabling symptoms even when that treatment has been previously eschewed.⁵⁶ Using conventional quantitative approaches, the findings from this study may inform future interventions that can evaluate providers' ability to engage in negotiated decision-making around patients' personal beliefs and whether these discussions lead to greater ICS adherence. However, providers must first be trained in persuasive communication and the provision of culturally competent care. Without such training it is unlikely that simply having knowledge of ICS beliefs or IM endorsement will change providers' communication strategies or patients' adherence behaviors.

The Institutes of Medicine states that clinical decisions should be evidenced-based.⁵⁷ Yet we know that patient education ("the truth") does not always (or even frequently) result in patients with asthma selecting the most effective treatment.⁵⁸ Further study is needed to understand how best to customize care according to patient needs and values using decision aids that are effective in mitigating culturally-based beliefs and preferences that interfere with the effective management of the asthma condition. Such patient-informed approaches may offer a new avenue to asthma control vis-à-vis patient-centered consensual interactions. Qualitative findings, such of reported here, may inform those future studies.

There are several implications for clinical practice and future research that can be drawn from this study. Patients have medication beliefs and preferences for self-management that can contribute to non-adherence but are unknown to the practitioner. If clinicians were to solicit medication beliefs and IM endorsement, not only would providers learn important information about their patients' self-management decisions but patients might also feel that their opinions matter. This creates an opportunity for patient-centered care exemplified by shared decision-making that better aligns patient preferences with evidence-based guidelines to achieve greater disease control. This study demonstrates that these conversations do not require more time during the clinical encounter although practitioners may benefit from additional training in IM and shared decision-making techniques. Future research may answer questions about how providers' expertise in persuasive communication can influence patients' disease management decisions. Specifically, the impact of shared decision-making on the quality of patient-provider partnership is in need of formal evaluation to better

understand the relationship between partnerships and enhanced medication adherence and disease control in low-income and minority adults with asthma.

In conclusion, patients' negative medication beliefs and IM endorsement are known to contribute to medication non-adherence and uncontrolled asthma. Clinical models of care such as shared decision-making can enhance patient-provider communication of the risks and merits associated with self-care decisions that may help reconcile conflicts between patients' preferences and evidence-based recommendations. Approaches such as these offer a compelling opportunity to deliver patient-centered care.

Acknowledgments

Funding

This study was supported by the National Center for Complementary and Alternative Medicine (National Institute of Health) 1K23AT003907-01A1.

References

1. Marcus P, Arnold RJ, Ekins S, et al. A retrospective randomized study of asthma control in the US: Results of the CHARIOT study. *Current Medical Research and Opinion*. 2008; 24(12):3443–3452. [PubMed: 19032126]
2. Akinbami, OJ.; Moorman, JE.; Liu, X. Asthma prevalence, health care use, and mortality: United States, 2005–2009. US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics; 2011.
3. Reddel HK, Taylor DR, Bateman ED, et al. An official American Thoracic Society/European Respiratory Society statement: asthma control and exacerbations: standardizing endpoints for clinical asthma trials and clinical practice. *Am J Respir Crit Care Med*. 2009; 180(1):59–99. [PubMed: 19535666]
4. Urbano FL. Review of the NAEPP 2007 expert panel report (EPR-3) on asthma diagnosis and treatment guidelines. *J Manag Care Pharm*. 2008; 14(1):41–49. [PubMed: 18240881]
5. National Heart, Lung and Blood Institute. The morbidity & mortality: Chart book on cardiovascular, lung, and blood diseases. U.S. Department of Health and Human Services, National Institute of Health; 2012.
6. World Health Organization (WHO). World Health Organization; 2003. Adherence to long-term therapies: Evidence for action.
7. Williams LK, Peterson EL, Wells K, et al. Quantifying the proportion of severe asthma exacerbations attributable to inhaled corticosteroid nonadherence. *J Allergy Clin Immunol*. 2011; 128(6):1185–1191. e2. [PubMed: 22019090]
8. Horne R. Compliance, adherence, and concordance: Implications for asthma treatment. *CHEST Journal*. 2006; 130(1_suppl):65S–72S.
9. Bender BG, Bender SE. Patient-identified barriers to asthma treatment adherence: Responses to interviews, focus groups, and questionnaires. *Immunology and Allergy Clinics of North America*. 2005; 25(1):107–130. [PubMed: 15579367]
10. Chong J, Haran C, Asher I. Intermittent inhaled corticosteroid therapy versus placebo for persistent asthma in children and adults. *The Cochrane Library*. 2014
11. Boulet L, Vervloet D, Magar Y, Foster JM. Adherence: The goal to control asthma. *Clin Chest Med*. 2012; 33(3):405–417. [PubMed: 22929091]
12. Conn KM, Halterman JS, Lynch K, Cabana MD. The impact of parents' medication beliefs on asthma management. *Pediatrics*. 2007; 120(3):e521–e526. [PubMed: 17766496]
13. Eakin MN, Rand CS. Improving patient adherence with asthma self-management practices: What works? *Annals of Allergy, Asthma & Immunology*. 2012; 109(2):90–92.

14. Apter AJ, Boston RC, George M, et al. Modifiable barriers to adherence to inhaled steroids among adults with asthma: It's not just black and white. *J Allergy Clin Immunol*. 2003; 111(6):1219–1226. [PubMed: 12789220]
15. Le TT, Bilderback A, Bender B, et al. Do asthma medication beliefs mediate the relationship between minority status and adherence to therapy? *Journal of Asthma*. 2008; 45(1):33–37. [PubMed: 18259993]
16. Baptist AP, Deol BB, Reddy RC, Nelson B, Clark NM. Age-specific factors influencing asthma management by older adults. *Qual Health Res*. 2010; 20(1):117–124. [PubMed: 19940092]
17. George M, Birck K, Hufford DJ, Jemmott LS, Weaver TE. Beliefs about asthma and complementary and alternative medicine in Low-Income Inner-City African-American adults. *Journal of General Internal Medicine*. 2006; 21(12):1317–1324. [PubMed: 16995890]
18. Roy A, Lurslurchachai L, Halm EA, Li X, Leventhal H, Wisnivesky JP. Use of herbal remedies and adherence to inhaled corticosteroids among inner-city asthmatic patients. *Annals of Allergy, Asthma & Immunology*. 2010; 104(2):132–138.
19. NCCAM. Complementary, alternative, or integrative health: What's in a name? National Center for Complementary and Alternative Medicine. 2014. Retrieved from https://nccih.nih.gov/sites/nccam.nih.gov/files/CAM_Basics_What_Are_CAIHA_07-15-2014.2.pdf
20. Barnes PM, Bloom B, Nahin RL. National Center for Health Statistics (US). Complementary and alternative medicine use among adults and children: United States. Complementary and alternative medicine use among adults and children: United States, 2007. 2008; 10(12):1–23.
21. Esmail N. Complementary and alternative medicine in Canada: Trends in use and public attitudes 1997–2006. The Fraser Institute. 2007; 21:18.
22. Fiscella K, Epstein RM. So much to do, so little time: Care for the socially disadvantaged and the 15-minute visit. *Arch Intern Med*. 2008; 168(17):1843–1852. [PubMed: 18809810]
23. Pantalon MV, Sledge WH, Bauer SF, et al. Important medical decisions: Using brief motivational interviewing to enhance patients' autonomous decision-making. *J Psychiatr Pract*. 2013; 19(2):98–108. [PubMed: 23507811]
24. Battersby M, Von Korff M, Schaefer J, et al. Twelve evidence-based principles for implementing self-management support in primary care. *Joint Commission Journal on Quality and Patient Safety*. 2010; 36(12):561–570. [PubMed: 21222358]
25. Charlton CR, Dearing KS, Berry JA, Johnson MJ. Nurse practitioners' communication styles and their impact on patient outcomes: An integrated literature review. *J Am Acad Nurse Pract*. 2008; 20(7):382–388. [PubMed: 18638178]
26. Schoenthaler A, Chaplin WF, Allegrante JP, et al. Provider communication effects medication adherence in hypertensive African Americans. *Patient Educ Couns*. 2009; 75(2):185–191. [PubMed: 19013740]
27. DiMatteo MR. The role of the physician in the emerging health care environment. *West J Med*. 1998; 168(5):328–333. [PubMed: 9614789]
28. Cooper LA, Roter DL, Carson KA, et al. A randomized trial to improve patient-centered care and hypertension control in underserved primary care patients. *Journal of General Internal Medicine*. 2011; 26(11):1297–1304. [PubMed: 21732195]
29. Schedlbauer A, Schroeder K, Peters T, Fahey T. Interventions to improve adherence to lipid lowering medication. The Cochrane Library. 2004
30. Wallen GR, Brooks AT. To tell or not to tell: Shared decision making, CAM use and disclosure among underserved patients with rheumatic diseases. *Integrative Medicine Insights*. 2012; 7:15. [PubMed: 23071389]
31. Wilson SR, Strub P, Buist AS, et al. Shared treatment decision making improves adherence and outcomes in poorly controlled asthma. *American Journal of Respiratory and Critical Care Medicine*. 2010; 181(6):566–577. [PubMed: 20019345]
32. Eisenberg DM, Kessler RC, Van Rompay MI, et al. Perceptions about complementary therapies relative to conventional therapies among adults who use both: Results from a national survey. *Ann Intern Med*. 2001; 135(5):344–351. [PubMed: 11529698]
33. Collins KS, Fund C. Diverse communities, common concerns: Assessing health care quality for minority Americans. 2002

34. Howell L, Kochhar K, Saywell R Jr, et al. Use of herbal remedies by Hispanic patients: Do they inform their physician? *J Am Board Fam Med*. 2006; 19(6):566–578. [PubMed: 17090790]
35. Tasaki K, Maskarinec G, Shumay DM, Tatsumura Y, Kakai H. Communication between physicians and cancer patients about complementary and alternative medicine: Exploring patients' perspectives. *Psycho-Oncology*. 2002; 11(3):212–220. [PubMed: 12112481]
36. Lawson PJ, Flocke SA. Teachable moments for health behavior change: A concept analysis. *Patient Educ Couns*. 2009; 76(1):25–30. [PubMed: 19110395]
37. Sandelowski M. Focus on research methods-whatever happened to qualitative description? *Research in Nursing and Health*. 2000; 23(4):334–340. [PubMed: 10940958]
38. BLINDED REFERENCE.
39. BLINDED REFERENCE.
40. Elo S, Kyngäs H. The qualitative content analysis process. *J Adv Nurs*. 2008; 62(1):107–115. [PubMed: 18352969]
41. Lincoln, YS.; Guba, CG. *Naturalistic Inquiry*. California: Sage Publications; 1985.
42. George M, Campbell J, Rand C. Self-management of acute asthma among low-income urban adults. *Journal of Asthma*. 2009; 46(6):618–624. [PubMed: 19657906]
43. George M, Freedman TG, Norfleet AL, Feldman HI, Apter AJ. Qualitative research-enhanced understanding of patients' beliefs: Results of focus groups with low-income, urban, african american adults with asthma. *J Allergy Clin Immunol*. 2003; 111(5):967–973. [PubMed: 12743559]
44. Poniaman D, Wisnivesky JP, Leventhal H, Musumeci-Szabó TJ, Halm EA. Impact of positive and negative beliefs about inhaled corticosteroids on adherence in inner-city asthmatic patients. *Annals of Allergy, Asthma & Immunology*. 2009; 103(1):38–42.
45. Cotton S, Luberto CM, Yi MS, Tsevat J. Complementary and alternative medicine behaviors and beliefs in urban adolescents with asthma. *Journal of Asthma*. 2011; 48(5):531–538. [PubMed: 21504264]
46. Handelman L, Rich M, Bridgemohan CF, Schneider L. Understanding pediatric inner-city asthma: An explanatory model approach. *Journal of Asthma*. 2004; 41(2):167–177. [PubMed: 15115169]
47. Lanski SL, Greenwald M, Perkins A, Simon HK. Herbal therapy use in a pediatric emergency department population: Expect the unexpected. *Pediatrics*. 2003; 111(5):981–985. [PubMed: 12728075]
48. Naimi DR, Freedman TG, Ginsburg KR, Bogen D, Rand CS, Apter AJ. Adolescents and asthma: Why bother with our meds? *J Allergy Clin Immunol*. 2009; 123(6):1335–1341. [PubMed: 19395075]
49. Wisnivesky JP, Kattan M, Evans D, et al. Assessing the relationship between language proficiency and asthma morbidity among inner-city asthmatics. *Med Care*. 2009; 47(2):243–249. [PubMed: 19169126]
50. George M, Margolis ML. Race and lung cancer surgery—a qualitative analysis of relevant beliefs and management preferences. 2010; 37(6):740–748.
51. Eiser AR, Ellis G. Viewpoint: Cultural competence and the African American experience with health care: The case for specific content in cross-cultural education. *Acad Med*. 2007; 82(2):176–183. [PubMed: 17264697]
52. Smedley, BD.; Stith, AY.; Nelson, AR. *Unequal treatment: Confronting racial and ethnic disparities in health care*. Vol. 1. National Academies Press, DC; 2003.
53. Ventola CL. Current issues regarding complementary and alternative medicine (CAM) in the United States: Part 1: The widespread use of CAM and the need for better-informed health care professionals to provide patient counseling. *P T*. 2010; 35(8):461–468. [PubMed: 20844696]
54. Powell H, Gibson PG. Options for self-management education for adults with asthma. *The Cochrane Library*. 2002
55. Akinbami OJ. Trends in asthma prevalence, health care use and mortality in the United States, 2001–2010. 2012

56. Street RL, Slee C, Kalauokalani DK, Dean DE, Tancredi DJ, Kravitz RL. Improving physician–patient communication about cancer pain with a tailored education-coaching intervention. *Patient Educ Couns*. 2010; 80(1):42–47. [PubMed: 19962845]
57. Knebel, E.; Greiner, AC. *Health professions education: A bridge to quality*. National Academies Press; 2003.
58. Baiardini I, Braidò F, Bonini M, Compalati E, Canonica GW. Why do doctors and patients not follow guidelines? *Curr Opin Allergy Clin Immunol*. 2009; 9:228–233. [PubMed: 19390434]

Table 1

Providers characteristics N= 10

Characteristics	N (%)
Age Mean (SD)	52 (8.6)
Gender	
Male	2 (20%)
Female	8 (80%)
Race	
White	8 (80%)
Black/African American	1 (12.5%)
Asian	1 (12.5%)
Ethnicity	
Hispanic or Latino	0%
Marital status	
Single	8 (80%)
Married	0%
Divorced	2 (20%)
Separated	0%
Widowed	0%
Years in practice Mean (SD)	18.3 (11.3)
Discipline	
Physician	5 (50%)
Nurse practitioner	5 (50%)
Specialty training	
Primary care	7 (70%)
Family practice	1 (10%)
Internal medicine	1 (10%)
Employment status	
Full time	9 (90%)
Part time	1 (10%)
Number of asthma patients seen per month Mean (SD)	16.3 (7.7)
Participation in study	
One time	3 (30%)
Two times	1 (10%)
Four times	3 (30%)
Five times	2 (20%)
Six times	1 (10%)

Table 2

Patients characteristics N=33

Characteristics	Total N (%)	CAM-A completed after visit (N=18)	CAM-A completed before visit (N=15)
Age Mean (SD)	48.1 (14.6)	52.12 (14.5)	43.4 (13.7)
Gender			
Male	1 (3.7%)	1 (5.6%)	0 (0%)
Female	32 (96.7%)	17 (94.4%)	15 (100%)
Ethnicity			
Hispanic or Latino	2 (8.3%)	1 (5.6%)	1 (6.7%)
Race			
Black/African American	33 (100%)	18 (100%)	15 (100%)
Marital status			
Single	15 (45.45%)	9 (50%)	6 (40%)
Married	7 (21.21%)	3 (16.7%)	4 (26.7%)
Divorced	5 (15.15%)	3 (16.7%)	2 (13.3%)
Separated	4 (12.12%)	2 (11.1%)	2 (13.3%)
Widowed	2 (6.06%)	1 (5.6%)	1 (6.7%)
Age when first diagnosed with asthma Mean (SD)	26.47 (18.70)	27.18 (19.23)	25.47 (18.92)
Occupation			
Unemployed	11 (33.33%)	5 (27.8%)	6 (40%)
Manual/service	5 (15.15%)	4 (22.2%)	2 (13.3%)
Skilled professional	8 (24.24%)	3 (16.7%)	5 (33.3%)
Student	2 (6.06%)	1 (5.6%)	1 (6.7%)
Retired	4 (12.12%)	2 (11.1%)	1 (6.7%)
Other (chef; EMS; on disability)	3 (9.09%)	3 (16.7%)	0 (0%)
Highest educational level			
Grade school (7 th)	1 (3.7%)	1 (5.6%)	0 (0%)
Some high school	8 (24.24%)	5 (27.8%)	3 (20%)
Completed high school/obtained GED	12 (36.36%)	6 (33.3%)	6 (40%)
Completed vocational training	1 (3.7%)	1 (5.6%)	0 (0%)
Some college	5 (15.15%)	2 (11.1%)	3 (20%)
Graduate of 2 year college	3 (9.09%)	2 (11.1%)	1 (6.7%)
Graduate of 4 year college	3 (9.09%)	1 (5.6%)	2 (13.3%)
Insurance			
Medicaid	9 (27.27%)	6 (33.3%)	3 (20%)
Medicare/SSI	11 (33.3%)	5 (27.8%)	6 (40%)
Commercial	11 (33.3%)	5 (27.8%)	6 (40%)
Other	2 (6.1%)	2 (11.1%)	0 (0%)
Income			
\$0–9,999	17 (51.51%)	9 (50%)	8 (53.3%)
\$10–19,999	6 (18.18%)	4 (22.2%)	2 (13.3%)
\$20–29,999	2 (6.06%)	1 (5.6%)	0 (0%)

Characteristics	Total N (%)	CAM-A completed after visit (N=18)	CAM-A completed before visit (N=15)
\$30–39,999	4 (12.12%)	1 (5.6%)	3 (20%)
\$40–40,999	4 (12.12%)	3 (16.7%)	1 (6.7%)
\$50,000	1 (3.7%)	0 (0%)	1 (6.7%)
Currently smokes or ever smoked in past	21 (63.64%)	10 (55.6%)	11 (73.3%)
Yes			
IM endorsement	31 (94%)	17 (94.4%)	14 (93.3%)
Negative ICS Beliefs	25 (75.8%)	12 (66.7%)	13 (86.7%)