Asthma knowledge, attitude and prescribing behavior of primary health care physicians in the Kingdom of Bahrain

Fatima Ahmed Al-Jurdabi, MD, ABFM, RCSI* Huda Al-Ebraheem, Diploma in Asthma, MD, ABFM**

*Consultant Family Physician, Head of Jidhafs Health Centre, Kingdom of Bahrain

**Consultant Family Physician, Naim Health Centre, Kingdom of Bahrain

Correspondence to: Fjirdabi@health.gov.bh

الملخص: الهدف: دراسة معرفة وتوجهات وسلوك أطباء الرعاية الصحية الأولية في مملكة البحرين حول علاج الربو.

طرق البحث: دراسة مستعرضة في الفترة من مارس 2012 الى مارس 2013 في مملكة البحرين لأطباء الرعاية الصحية الأولية الذين حضروا ورش عمل حول الربوكجزء من التعليم الطبي المستمر. وخلال فترة الدراسة تم تقديم خمس ورش عمل. بلغ عدد الأطباء الذين حضروا ورش العمل حوالي 250 طبيب وطبيبة. تم الحصول على المعلومات من خلال استبيان التقييم الذاتي وهذ الاستبيان تم استخدامه سابقا في دراسات اجريت في الولايات المتحدة الأمريكية والمملكة العربية السعودية وتم اخذ الموافقة منهم لاستخدام نفس الاستبيان.تم توزيع الاستبيان قبل البدء بورش العمل وأكمل الاستبيان حوالي 192 طبيب وطبيبة من اصل 250 من الذين حضروا الورشة وهذا يمثل نسبة استجابة حوالي 80 بالمئة.

النتائج: أوضحت الدراسة ان معظم المشاركين كانو أطباء عائلة (66.7%) وان 73.4% منهم يتبعون الدليل الارشادي للربو، كما اوضحت الدراسة ان حوالي (56.8%) منهم كانو قادرين على تقييم مستوى السيطرة على الربو بشكل مناسب وافادت الغالبية منهم بإعطاء مواعيد منتظمة لمرضاهم ولكن اوضحت الدراسة ايضا ان 39.1% فقط من اطباء الرعاية الصحية الأولية على علم بالعلاج المناسب الموصى به للخطوة رقم 1، كما أفاد 37.3% فقط منهم بتقديم خطة مكتوبة لمرضاهم.

الخلاصة: أوضحت الدراسة بوجود جوانب مختلفة من توصيات الدليل الارشادي للربو قد تم دمجها في الممارسات السريرية في حين ان ما زال هناك بعض التوصيات لم يتم الأمتثال بها من قبل اطباء الرعاية الصحية الأولية في مملكة البحرين.

مفتاح الكلمات: أطباء الرعاية الصحية الأولية، مرض الربو، مملكة البحرين.

ABSTRACT

Background: Asthma is a serious public health problem, affecting people of all ages. When uncontrolled it can cause significant morbidity and mortality. Poor implementation of the guidelines is considered one of several barriers for achieving asthma control.

Objectives: To determine the asthma knowledge, attitude and prescribing behavior of primary health care physicians in the Kingdom of Bahrain.

Methods: A cross–sectional survey was carried out from March 2012 to March 2013 among primary health care physicians (PHC) attending asthma workshops as part of a continuing medical education program. During the study period 5 workshops were conducted which were attended by PHC physicians. A self-administered questionnaire was designed to achieve the research objective. The questionnaire was based primarily on a previous study carried out by the Chicago Asthma Surveillance Initiative (CASI) in the USA; a similar questionnaire was used in a study conducted in 2004, and permission was taken from the investigators to use it in our study. Questionnaires were distributed to the study groups at the beginning of each workshop and 192 of the 240 attending doctors completed the questionnaire, an 80% response rate.

Results: The responders were mainly family physicians (66.7%), of whom 73.4% were following asthma guidelines. The study showed that slightly more than half of PHC physicians (56.8%) were able to assess the level of asthma control appropriately and the majority of them reported scheduling regular follow-ups for their patients. However, only 39.1% of PHC physicians were aware of the appropriate medication recommended for step 1 and only 37.3% of them reported that they provided written plans for their patients.

Conclusion: Various aspects of GINA guidelines appear to have been integrated into clinical practice by primary care physicians in the Kingdom of Bahrain, whereas other recommendations do not seem to have been readily implemented.

Keywords: primary health care physicians; bronchial asthma; PHC; Kingdom of Bahrain

INTRODUCTION

Asthma is a common inflammatory disorder of the lungs, characterized by reversible airflow limitation and an increased airway hyper-responsiveness to a variety of stimuli, leading to recurring episodes of characteristic signs and symptoms.[1]

According to the World Health Organization (WHO), almost 300 million people suffer from asthma worldwide and with the rising trends it is expected to increase to 400 million by 2025. and nearly 255,000 people die annually from asthma.[2] The prevalence is continuously increasing and is expected to rise by a further 100 million by the year 2025.[3] A study in the United Kingdom showed an increase in the prevalence by more than 5.5-12%.[4] In the Gulf and the region there is a paucity of data about the distribution

of asthma, some studies have been carried out but they involved relatively small samples of patients. In Saudi Arabia the prevalence of asthma has been investigated in several studies and it has been found to have increased from 8% in 1986 to 23% in 1995.[5-6]

Increasing air pollution, rapid modernization, and widespread construction work are some of the reasons suggested for the increasing asthma problem, in addition to poor access to medical services, the high cost of effective drugs and poor health education among the affected population.[7]

Studies have shown that the majority of patients in developed and developing counties do not obtain optimal care, and therefore, are not well controlled.[8] Poorly controlled asthma may cause significant morbidity and mortality whereas early treatment, proper administration of medication and monitoring of the disease can decrease the frequency of exacerbation, hospitalization and the mortality rate.[9]

In order to improve the quality of asthma care, several approaches have been attempted These include establishment of clinical guidelines for the diagnosis and management of asthma, such as GINA (Global Initiative for Asthma)[10] and NAEPP (National Asthma Education and Prevention Program),[11] as well as improvement of the knowledge and attitude of asthmatic patients and general practitioners by educational programs. Several guidelines have emphasized the perception of asthma as chronic inflammation of airways with stepwise use of anti–inflammatory medications.[10-14] Despite this, previous studies suggest the existence of a gap between actual asthma care and guideline recommendations.[15-18]

The Ministry of Health in the Kingdom of Bahrain adopted the GINA guidelines in 2004 and some primary health care physicians have been trained to apply them in their practice. The authors are not aware of any previous local published studies on assessment of asthma management among GPs. Therefore, this study's objective was to assess bronchial asthma knowledge, attitude, and the prescribing behavior of primary health care physicians in the Kingdom of Bahrain since the introduction of the guidelines.

METHODS

A self-administered questionnaire was designed to achieve the research objective. The questionnaire was based primarily on a previous study carried out by the Chicago Asthma Surveillance Initiative (CASI) in the USA.[19] A similar questionnaire was used by Abdulrahman Abudahish and Hassan Bella[16] in their study which was conducted on 2004 and permission was taken from them to use it in our study. A slight modification of the questionnaire was made in order to comply with the new recommendations of GINA guidelines. The original questionnaire contained 7 case scenarios which were used in this study with minimal modification. We examined the assessment of level of

asthma control instead of assessment of asthma severity for the first three cases and step 1 treatment as an alternative for treatment of intermittent asthma in adults and children for cases number four and five. All cases had a single correct response.

The questionnaire (see Appendix) contained 25 questions, most of which were multiple choice, aiming at assessment of three important aspects from the participating physicians; the physicians' knowledge, practice and attitude. It covered mainly the following items:

1. Demographic information about the respondents such as age, gender, time in practice.
2. Clinical monitoring of asthma patients.
3. Pharmacological and non-pharmacological treatment of asthma.
4. Opinions and beliefs about treatment options and reasons for referrals.
5. Use of asthma practice guidelines.
6. Follow-up of patients.
7. Education of asthma patients.

The survey was carried out during the period from March 2012 to March 2013 among primary care physicians attending asthma workshops as part of a continuing medical education program (CME). During the study period 5 workshops were conducted and about 250 physicians attended. Questionnaires were distributed to the study groups before the beginning of each workshop and 192 of the 240 attending doctors completed it, a response rate of 80%. Scoring of case scenarios on asthma was used to determine the physicians' knowledge.

The questionnaire was pilot tested on primary care physicians working in one primary care health centre. No significant alterations were required to the questionnaire following the pilot study so that the same questionnaire was used in the actual study.

Responses were coded and data were entered and analyzed using SPSS software (version 20). The mean ± standard deviation was calculated for numerical variables. Percentage was calculated for categorical variables.

RESULTS

The survey was completed by 192 of the 240 PHC physicians, a response rate of 80%.

• **General Characteristics of Physicians**

The responders were mainly female (67.7%) and 74.5% were Bahraini. Most of the physicians were family physicians (66.7%) and aged >34 years (70.8%). About 66% of the responders had been in practice for 10 years or more.

• **Clinical Monitoring**

The physicians were questioned on aspects of asthma monitoring and assessment of level of control. Table 1

illustrates that slightly more than half of PHC physicians (56.8%) were able to assess the level of asthma control appropriately.

Case Scenarios

	Score	n=192 (%)
Item 1		
Level of asthma control (see questionnaire Q 9, 10, 11)		
	0	5 (2.6)
	1	23 (12.0)
	2	55 (28.6)
	3	109 (56.8)
Item 2		
Appropriate	0	94 (49.0)
	1	23 (12.0)
	2	75 (39.1)
Item 3		
Appropriate follow-up of controlled case (see questionnaire Q23)		
	0	52 (27.1)
	1	140 (72.9)
Item 4		
Referral of a child with severe persistent asthma (see questionnaire Q13)		
	0	57 (29.7)
	1	35 (70.3)
Total Score (out of 7)		
	0	1 (0.5)
	1	10 (5.2)
	2	21 (10.9)
	3	49 (25.5)
	4	42 (21.9)
	5	39 (20.3)
	6	30 (15.6)

Table 1. Scoring achieved by PHC physicians for case scenarios of asthma patients

The physicians reported that during routine office visits, they most often monitored the following: day-time symptoms (92%), frequency of disturbed sleep (93.2%), activity level (91.7%), work/school days lost due to asthma (84.9%) and B2 agonist use (90%). Direct observation of inhaler techniques was reported by 72.4% of physicians and routine use of peak flow measurements was reported by 67.7%.

Physicians were also asked about their opinion regarding the usefulness of home peak flow monitoring for patients 5 years and over with moderate to severe persistent asthma. 51.6% of physicians described routine home peak flow monitoring as "often useful" and 41.1% reported it to be "somewhat useful." Only 7.3% of physicians described home peak flow monitoring as not useful. However, 16.1 % of PHC physicians regularly checked peak expiratory flow during exacerbation (Table 2).

	Frequency	%	Valid %	Cumulative %
Never	35	18.2	18.2	18.2
Rarely	51	26.6	26.6	44.8
Sometimes	75	39.1	39.1	83.9
Often	31	16.1	16.1	100.0
Total	192	100.0	100.0	

Table 2. How often do you use peak expiratory flow in acute symptomatic patients?

The survey also included questions on aspects of emergency care. As reported in Table 3, 75.5% of PHC physicians used inhaled salbutamol via nebulizer while half of them (50%) used the inhaled salbutamol via spacer. Additional treatment reported by PHC physicians during acute exacerbation of asthma included IV hydrocortisone (79.2%), oral steroid (72.9%) and atrovent (66.1%), whereas only 6.3% used oral salbutamol during exacerbation (Table 3).

Medicine	Yes	No
Inhaled short-acting acting B2 agonist with spacer	96 (50%)	96 (50%)
Nebulized short-acting B2 agonist	45 (75.5%)	47 (24.5%)
Oral short-acting B2 agonist	12 (6.3%)	180 (93.8%)
IV hydrocortisone	52 (79.2%)	40 (20.8%)
Atrovent	127 (66.1%)	65 (33.9%)
IV theophylline	4 (22.9%)	148 (77.1%)
Oral steroids	40 (72.9%)	52 (27.1%)

Table 3. PHC physicians prescribing habits for patients with moderate to severe asthma attack

• **Medication Used in Treating Patients With Asthma**

The survey investigated physicians' awareness of the medication recommended for step 1 for adults and children, and revealed that only 39.1% of them were aware of appropriate medicine (Table1).

In their practice 72.4% of physicians never or rarely prescribed oral short-acting B2 agonists. However, 17.2% still prescribed oral short-acting B2 agonist very often and about 10.4% prescribed it sometimes. 71.9% of physicians reported that they had never or rarely prescribed long-acting B2 agonist without inhaled steroid (Table 4). The majority of the respondents (85.4%) reported that they had prescribed inhaled steroids for persistent or uncontrolled asthma (Table 4).

Prescribing behavior	Never	Rarely	Some-times	Often
Prescribing oral short-acting B2 agonist (Tablet or syrup)	73 (38%)	66 (34.4%)	20 (10.4%)	33 (17.2%)
Prescribing long-acting B2 agonist without steroid	109 (56.8%)	29 (15.1%)	35 (18.2%)	19 (9.9%)
Prescribing steroid inhaler for persistent asthma	0	5 (2.6%)	23 (12%)	164 85.4%

Table 4. Prescribing behavior of PHC physicians on management of asthma

The survey also enquired about the participants' opinions on the safety of inhaled corticosteroids at standard agreed doses. This we have reported in Table 5 which shows that 88.5% of the PHC physicians perceived inhaled corticosteroids as safe medicine, whereas only 5.7 % considered it as unsafe medicine.

• **Other Aspects of Asthma Management**

Awareness of the guidelines was high in that 73.4% of the physicians were following asthma guidelines. GINA guidelines were the most used (68.2%) and the majority (94.3%) of respondents believed that following asthma guidelines would improve their clinical practice.

Safety of inhaled steroid	Number (n=192)	Percentage
Very safe	75	39.0
Safe	95	49.5
Uncertain	11	5.7
Unsafe	10	5.2
Very unsafe	1	0.5
Total	192	100

Table 5. PHC Physicians' opinion regarding safety of inhaled steroids

When asked about their approach for the follow-up of patients with moderate, persistent asthma under control, the majority of physicians (72.9%) reported scheduling regular follow- up visits. However, 27.1% of the physicians reported seeing patients only when they were symptomatic.

Referral to specialists was most often for patients with a history of life-threatening episodes (95.8%). Other reasons for referral include multiple medication with continuous symptoms (89.1%), the presence of atypical signs and symptoms (82.3%), uncontrolled patients on step four

(80.2%) and the presence of unacceptable side effects of medication (59.4%). Less common reasons for referral included: history of previous hospitalization (30.7%) and all patients with uncontrolled asthma (38 %) as shown in Table 6.

	Yes	No
Previous hospitalization	59 (30.7%)	133 (69.3%)
Unacceptable side effects of medication	114 (59.4%)	78 (40.6%)
Multiple medication with continued symptoms	171 (89.1%)	21 (10.9%)
Life-threatening episode	184 (95.8%)	8 (4.2%)
All patients with uncontrolled asthma	73 (38%)	119 (62%)
All patients need step 4 treatment or more	154 (80.2%)	38 (19.8%)
Atypical signs or symptoms	158 (82.3%)	34 (17.7%)

Table 6. PHC physicians' opinion about indications of referral for secondary care

The survey also evaluated the incorporation of patients' health education into clinical practice. The majority of the physicians reported the following: discussion with the patient's regarding mistaken beliefs (84.9%), the effect of smoking (95.8%), house dust mites (95.8%), animal allergens (93.8%) and the effect of cockroaches (67.2%).

When physicians were asked about the use of a written asthma action plans (WAAP) for their patients as a part of patient care, only 37.3% of them reported that they had used them.

DISCUSSION

The majority of respondents were aware of the availability of asthma guidelines; however, the survey did not ask whether the respondents have ever read the guidelines.

The results suggest that there are several key aspects in the delivery of asthma care by PHC physicians that are consistent with the guidelines' recommendations. For example, the survey inquired into several aspects of peak flow use. Most of the responding physicians reported routine PEFR monitoring during routine office visits and half of them routinely use it for acute symptomatic patients. The study also tested the criteria for referral to specialists and it showed that most physicians would refer patients with life-threatening episodes and on multiple medications with continuous symptoms. Most of the PHC physicians reported scheduling regular follow-up for their patients which is consistent with the guidelines. However, the survey also identified several other aspects of asthma care that are less consistently observed in accordance with the guidelines' recommendations. For example, the study showed that only

37% of physicians give their patients written instructions. The use of written asthma action plans is a key aspect of patient education, and their use has been associated with decreased morbidity.[20] Tan et al. demonstrated in their study that GPs rarely used a written asthma action plan (WAAP) despite their perceived usefulness. This may be attributed to a lack of time related to patient loads in GP clinics and GPs lack of training and practice.[21]

In addition, the study showed that 28.1% of PHC physicians are still prescribing a long-acting B2 agonist without steroid. Its use as mono-therapy should be avoided as this may increase the risk of serious side effects in patients with unstable asthma.[22] It has also been shown that 27.6% of PHC physicians prescribed an oral short-acting B2 agonist (SABA). Oral administration of SABA was not recommended because it has not been shown to be more effective than inhaled SABA and has been associated with an increased frequency of side effects.[23]

The study also disclosed that only about 44% of PHC physicians were unable to assess the level of control correctly and this may represent a major obstacle in managing asthma cases not only because of the lack of proper assessment but also because of inappropriate controller selection. Different studies have shown that continuous medical education can increase the knowledge of physicians after graduation especially in younger physicians.[23] Unfortunately, our study did not investigate the proportion of PHC physicians who have ever participated in an asthma educational program.

CONCLUSIONS

Various aspects of the GINA guidelines appear to have been integrated into clinical practice by primary care physicians, whereas other recommandations do not appear to have been readily adopted. This information suggests areas for intervention such as improvement of physicians' knowledge regarding proper assessment of the level of control and provision of appropriate management accordingly. This study also recommends further studies or audits to assess physicians' adherence to the guidelines and to look for possible causes behind decreased compliance with the guidelines' recommendations.

REFERENCES

1. Global Initiative for Asthma (GINA). Global strategy for asthma management and prevention. Vancouver, WA: GINA; 2012. Available at: http://www.ginasthma.org

2. WHO. Chronic respiratory diseases: asthma facts. Geneva: WHO; 2010. Cited 2010 March 11. Available at: http://www.who.int/respiratory/asthma/scope/en/index.html

3. Pawankar R, Canonica GW, Holgate ST, Lockey RF, World Allergy Organization. The WAO white book on allergy. United Kingdom: WAO; 2011. p.1-216. Available at: http://www.worldallergy.org/UserFiles/file/WAO-white-Book-on-Allergy.pdf

4. Burr ML, Butland BK, King S, Vaughan-Williams E. Changes in asthma prevalence: two surveys 15 years apart. Arch Dis Child. 1989 Oct;64(10):1452-6.

5. Al Frayh AR, Shakoor Z, Gad El Rab MO, Hasnain SM. Increased prevalence of asthma in Saudi Arabia. Ann Allergy Asthma Immunol. 2001 Mar;86(3):292-6.

6. Worldwide variations in the prevalence of asthma symptoms: the International Study of Asthma and Allergies in Childhood (ISAAC). Eur Respir J. 1998 Aug;12(2):315-35.

7. Ramos RG, Talbott EO, Youk A, Karol MH. Community urbanization and hospitalization of adults for asthma. J Environ Health. 2006 Apr;68(8):26-32, 44.

8. Demoly P, Gueron B, Annunziata K, Adamek L, Walters RD. Update on asthma control in five European countries: results of a 2008 survey. Eur Respir Rev. 2010 Jun;19(116):150-7.

9. Bateman ED, Reddel HK, Eriksson G, Peterson S, Ostlund O, Sears MR, et al. Overall asthma control: the relationship between current control and future risk. J Allergy Clin Immunol. 2010 Mar;125(3):600-8.

10. Bateman ED, Hurd SS; Barnes PJ, Bousquet J, Drazen JM, FitzGerald M. Global strategy for asthma management and prevention: GINA executive summary. Eur Respir J. 2008 Jan;31(1):143-78.

11. National Heart, Lung, and Blood Institute. National Asthma Education Program. Expert Panel on the Management of Asthma. Guidelines for Diagnosis and Management of Asthma. Bethesda, MD: U.S. Department of Health and Human Services; National Institutes of Health; National Heart, Lung, and Blood Institutes; National Asthma Education and Prevention Program; 2007. Available at: http://www.nhlbi.nih.gov/guidelines/asthma

12. Bergner A, Bergner RK. International consensus report on diagnosis and treatment of asthma: a call to action for US practitioners. Clin Ther. 1994 Jul-Aug;16(4):694-706; discussion 693.

13. Warner JO, Götz M, Landau LI, Levison H, Milner AD, Pedersen S, et al. Management of asthma: a consensus statement. Arch Dis Child. 1989 Jul;64(7):1065-79.

14, Hargreave FE, Dolovich J, Newhouse JT. The assessment and treatment of asthma: a conference report. J Allergy Clin Immunol. 1990 Jun;85(6):1098-111.

15. Crim C. Clinical practice guidelines vs actual clinical practice: the asthma paradigm. Chest. 2000 Aug;118(2 Suppl):62S-64S.

16. Abudahish A, Bella H. Primary care physicians perceptions and practices on asthma care in Aseer region, Saudi Arabia. Saudi Med J. 2006 Mar;27(3):333-7.

17. Rovithis E, Lionis C, Schiza SE, Bouros D, Karokis A, Vlachonikolis I, et al. Assessing the knowledge of bronchial asthma among primary health care physicians in Crete: a pre- and post-test following an educational course. BMC Med Educ. 2001 August 1; 1:2.

18. Weingarten S, Stone E, Hayward R, Tunis S, Pelter M, Huang H, et al. The adoption of preventive care practice guidelines by primary care physicians: do actions match intentions? J Gen Intern Med. 1995 Mar;10(3):138-44.

19. Grant EN, Moy JN, Turner-Roan K, Daugherty SR, Weiss KB. Asthma care practices, perceptions, and beliefs of Chicago-area primary-care physicians. Chest. 1999 Oct;116(4 Suppl 1):145S-154S.

20. Lieu TA, Quesenberry CP Jr, Capra AM, Sorel ME, Martin KE, Mendoza GR. Outpatient management

practices associated with reduced risk of pediatric asthma hospitalization and emergency department visits. Pediatrics. 1997 Sep;100(3 Pt 1):334-41.

21. Tan NC, Tay IH, Ngoh A, Tan M. A qualitative study of factors influencing family physicians' prescribing of the Written Action Plan in primary care in Singapore. Singapore Med J. 2009 Feb;50(2):160-4.

22. Wijesinghe M, Perrin K, Harwood M, Weatherall M, Beasley R. The risk of asthma mortality with inhaled long acting beta-agonists. Postgrad Med J. 2008 Sep;84(995):467-72.

23. Nelson HS, Weiss ST, Bleecker ER, Yancey SW, Dorinsky PM; SMART Study Group. The Salmeterol Multicenter Asthma Research Trial: a comparison of usual pharmacotherapy for asthma or usual pharmacotherapy plus salmeterol. Chest. 2006 Jan;129(1):15-26. Erratum in: Chest. 2006 May;129(5):1393.

ACNOWLEDGEMENTS

APPENDIX

1-   Age: _____ years

2-   Sex: 1- Male □   2- female □

3-   Nationality: 1- Bahraini □   2- Non-Bahraini □

4-   Qualification:

4.1- General practitioner   □

4.2- Family physician   □

4.3- Other board   □

       Please, specify the specialty _____

5-   Duration in primary health care service in Bahrain _____ years

6-   Do you follow a specific asthma guideline in your management?

      1- Yes □   2- No □ If No go to question No 8

7-   If yes, please mention the name of this guideline_____

8-   Do you think Adherence to specific asthma guideline will improve the outcome of patient management?

      1- Yes □   2- No □   3- Uncertain □   4- Other □ specify _____

      The next three questions ask you to classify patients according to level of asthma control (Please choose **ONE** response only)

9-   38 years old, nonsmoker, with Peak Expiratory Flow (PEF) of 60% of predicted, uses B2 agonist daily for his daily symptoms, and has 3-4 nocturnal symptoms per a week. This patient would be classified as having:

      1- Controlled asthma   □

      2- Partly controlled   asthma   □

      3- Uncontrolled   asthma   □

      5- Don't Know   □

10- A 46 years old female non-smoker, with a PEF of 80% of predicted, has symptoms twice a week which require B$_2$ – agonist and sometimes require her to stop her activities, and has no nocturnal symptoms. This patient would be classified as having:

      1- Controlled asthma   □

      2- Partly controlled   asthma   □

      3- Uncontrolled   asthma   □

      5- Don't Know   □

11- A 20 years old female non-smoker, with a PEF of 80% of predicted, has symptoms less than twice a week which require B$_2$ – agonist of same frequency. She has no limitation of daily activities, and no nocturnal symptoms. This patient would be classified as having:

      1- Controlled asthma   □

      2- Partly controlled asthma   □

      3- Uncontrolled   asthma   □

      5- Don't Know   □

12- What medications are most likely to prescribe for a patient with MILD INTERMITTENT symptoms or controlled asthma on step 1 treatment with no triggers? (Please respond "yes" or "No" for EACH treatment listed).

	Adult		children	
	YES	No	YES	No
12.1 - Theophylline	□ 1	□ 2	□ 1	□ 2
12.2- Inhaled short acting B2 agonist	□1	□ 2	□ 1	□ 2
12.3- Oral short acting B2 agonist	□ 1	□ 2	□ 1	□ 2
12.4- Inhaled Steroid	□ 1	□ 2	□ 1	□ 2
12.5- Inhaled long acting B$_2$ agonist	□ 1	□2	□ 1	□ 2

13- For child (5 years and older) on step 3 treatment with daily symptoms that respond to t.i.d short acting inhaled beta 2-agonist and waking up more than three times a week with symptoms, what would you do next? (Please choose **ONE** response)

      1.   No change   □
      2.   Increase B$_2$ agonist   □
      3.   Add theophylline   □
      4.   Add inhaled steroids   □
      5.   Add oral steroids   □
      6.   Add Sodium Cromoglycate   □
      7.   Add long acting beta- agonist   □
      8.   Refer him to the specialist   □

14. How often do you do the following for your asthmatic patients:

14.1- Prescribe oral short acting B$_2$ agonist (tablet or syrup):
      1- Never □   2- Rarely □   3-Sometimes □
      4- Often □

14.2-Prescribe steroid inhaler for persistent asthma (mild, moderate or severe) or uncontrolled asthma:
      1- Never □   2- Rarely □   3- Sometimes □
      4- Often □

14.3-Prescribe long –acting B2 agonist without inhaled steroid
      1- Never □   2- Rarely □   3- Sometimes □
      4- Often □

15. In your experience, how safe are inhaled corticosteroids (at approved doses) for long-term use in chronic asthma? (Please choose ONE response only).
   1- Very safe □   2-safe □   3- Uncertain □
   4- Unsafe□   5-Very unsafe □
   The question below will assess your knowledge in the management of acute exacerbation of bronchial asthma.

16. Which of the following agents should be considered for treatment of moderate to severe acute exacerbation of asthma in an adult in conjunction with a short acting B_2 agonist? (please respond "YES' or "NO" for EACH item)

	YES	NO
16.1- Inhaled short acting B_2 agonist given by spacer	□1	□2
16.2-Nebulized short acting B_2 agonist	□1	□2
16.3- Oral short acting B_2 agonist	□1	□2
16.4- IV hydrocortisone	□1	□2
16.5- Inhaled atrovent	□1	□2
16.6- Oral theophylline	□1	□2
16.7- IV theophylline	□1	□2
16.8- Oral steroid	□1	□2

17. Which of the following factors routinely do you discuss with your asthmatic patients as a part of health education? (Please respond "YES" or "NO" for EACH factor listed).

	YES	NO
17.1- Wrong beliefs	□1	□2
17.2- Effect of smoking	□1	□2
17.3-House dust mites	□1	□2
17.4-Animal allergens	□1	□2
17.5-Cockroach allergens	□1	□2

18. Which of the following outcomes do you ROUTINELY monitor during office visits for your patient with asthma? (Please respond "YES' or "NO' for EACH item)

	YES	NO
18.1- Frequency of wheeze/ cough	□ 1	□ 2
18.2-Frequency of disturbed sleep due to asthma symptoms	□ 1	□ 2
18.3- Activity levels	□ 1	□ 2
18.4- Loss of work/ school days due to asthma	□ 1	□ 2
18.5- Specific frequency of use of beta 2 agonist.	□ 1	□ 2
18.6- Peak flow diary review (for patients 5 years and older)	□ 1	□ 2
18.7- Direct observation of inhaler technique (for patients 5 years and older)	□ 1	□ 2

19. Which of the following events would lead you to ROUTINELY refer to hospital? (please respond "YES' or "NO" for EACH item)

	YES	NO
19.1- Previous hospitalization	□1	□2
19.2- Unaccepted side effects of medication	□1	□2
19.3- On multiple medications with continued symptoms	□1	□2
19.4- A life- threatening episode	□1	□2
19.5- All patients with uncontrolled asthma	□1	□2
19.6- Signs or symptoms are atypical	□1	□2

20. In your experience, how often is routine peak flow monitoring for patients (5 years and older) with asthma

20.1 – At home:
   1-Often useful □   2- Sometimes useful □
   3- not useful □

20.2- At office:
   1-Often useful □   2- Sometimes useful □
   3- not useful □

21. How Often do you use peak expiratory flow in acute symptomatic patient
   1- Never □   2- Rarely □
   3- Sometimes □   4- Often □

22. Are you satisfied with your skill in demonstrating proper use of peak flow meter?
   1- Yes □   2- No □   3- Other □ specify _____

23. Which of following, if any, best describes your approach for following up asthmatic under good control? (Please choose ONE response only)
   1- Office visits when patient is symptomatic, no scheduled visits □
   2- Scheduled visits every 3 months □
   3- Other, specify_____□

24. Is your center supplied with the following:
   24.1- Peak flow meter   1- yes □   2- No □
   24.2- Steroid inhaler   1-yes □   2- No □
   24.3-Short acting Beta $_2$ agonist inhaler
        1-yes □   2-No □
   24.4- Short acting Beta $_2$ agonist nebulizer
        1-yes □   2-No □
   24.5- Long- acting Beta $_2$ agonist
        1-yes □   2-No □
   24.6- Theophylline tablet   1-yes □   2-No □

25. Do you ROUTINELY provide (Written Asthma Action Plan) written instructions for your asthmatic patient in the clinic?
        1- Yes □   2- No □