

Chapter 4:

The relationship between the management and control of asthma in primary health care

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JM du Plessis

CHAPTER 4

CONCLUSIONS, LIMITATIONS, RECOMMENDATIONS, AND REFLECTION OF THE STUDY

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CHAPTER 4

4.1. Introduction

Chronic illnesses (e.g. asthma), injuries, HIV and AIDS, as well as conditions that are poverty related, can all be considered a part of the massive burden of disease carried by South Africa. Such conditions affect people of all ages and play a tremendous role in the economy (labour and household earning capacity) of a country (SAHR, 2008:51 & 79). Therefore, the need exists to reinforce “population-based disease management”, strengthened through models and instruments that are able to assess risk (Vollmer *et al.*, 2002:195) e.g. smoking cessation, to improve overall health and life expectancy (Hylkema *et al.*, 2007:442). This demands a major mind shift around health care service delivery and the assessment of its quality (Chassin *et al.*, 1998:1004). Ruffin *et al.* (2005:S39) questioned the need for algorithms to assist the health care providers in managing asthma. An algorithm is defined as: “step-by-step [written] protocol for management of a health care problem” (Stedman’s Medical Dictionary). According to Robert K Ross health care providers need to deliver relevant and appropriate multi-dimensional medical care for chronic health conditions, supported by language and culture (Babey *et al.*, 2009; Bailey *et al.*, 1992:263). Patient education in the medical management of their asthma and skills to monitor their disease stability and progress, including bronchodilator use monitoring and peak flow measuring to monitor their medical treatment are of utmost importance. This asks for exceptional patient-health care provider relationships in order to empower these patients, in order to regain function and health (Jaber, 2002:231). This comes to say that improved asthma management can lead to improved asthma control for the patient.

4.2. Summary of results and conclusions

This chapter formulates conclusions and recommendations according to the objectives stated in chapter 1. In order to draw such conclusions and make reasonable recommendations about the relationship between the management and

control of asthma in primary health care, the results of the data analysis were interpreted (see chapter 3 for records of the results obtained).

A quick glance at the study objectives will make reflection easier.

The study objectives were formulated as follow:

- To evaluate the information obtained and documented, by a public health care provider (HCP) from a patient on asthma treatment, during clinic visits of all three the stages of evaluation.
- To determine whether the diagnosis was clearly documented on patient records (irrespective of correctness).
- To refine / breakdown the examination into trigger factors, allergies, smoking status and important history of the interregnum, plus the documentation thereof.
- To determine whether the necessary control measurements such as peak expiratory flow rates (PEFR) were done.
- To evaluate the prescribed medication: types, appropriateness and dose adjustments (where applicable).
- To determine whether any asthma action/management plans were given to patients/parents/caregivers of asthmatic patients.
- To demonstrate the impact of small interventions towards improved outcomes.
- To determine any contingent relationship between the quality of health care and asthma control and to propose interventions based on the outcomes of the findings in the study, where feasible.

The following conclusions, pertaining to the study objectives, stemmed from the study results:

4.21. Patient information attained and documented

Overall:

Evaluation of clinic coded medical records during the time periods: May 1, 2008 to July 31, 2008 (stage 1); May 1, 2009 to July 31, 2009 (stage 2); and May 1, 2010 to July 31, 2010 (stage 3) concluded in a total of 323 patient records. The records of the

distribution between the three stages as well as the male to female ratios are documented in table 3 of article 2 (chapter 3). These asthmatic patients averaged an age of 52 years, ranging from 3 - 81years of age.

Positive results:

Overall the average age of asthmatic patients in the study correlates well with surveys done both at primary health care level in rural Sub-Saharan Africa, and internationally (United States – data from The National Heart, Lung, and Blood Institute) (Kengne *et al.*, 2008:437; NHLBI(a), 1999).

Negative results:

Childhood asthma (patients 12 years and younger) of a mere 2% (7 patients) of the overall recorded population was diagnosed and documented. This suggests a huge area of under- or misdiagnosed children, since a very large percentage of asthma patients (De Marco *et al.*, 2000; Marks, 2002; NHLBI(a), 1999; Subbarao *et al.*, 2009) falls in the age group of 18 years and younger.

Asthma control indicators – Symptoms:

Regarding the 5 most important symptoms (taken from the GINA® guidelines) that a health care provider needs to inquire about, and document, with each contact session in order to manage and control an asthmatic patient, namely night symptoms; tight chest or chest pain; shortness of breath; cough; and wheezing, the following were found (full details in table 4, article 2, chapter 3):

- For the year of 2008 – an average of 12% of symptoms was documented, while only 2% of the 125 patients had all five symptoms documented.
- For the year of 2009 – the average symptom documentation rate increased to 37% with 13% of the second collection stage found to have all five symptoms documented. This is still far below the target documentation rate of 80% but a massive improvement since 2008. This could imply that asthma education and training led to improved clinical documentation.
- The year of 2010 – demonstrated a drop of 17% with a symptom documentation rate of 20%, although the complete picture of ‘all 5 symptoms’ documented was slightly increased to 15%.

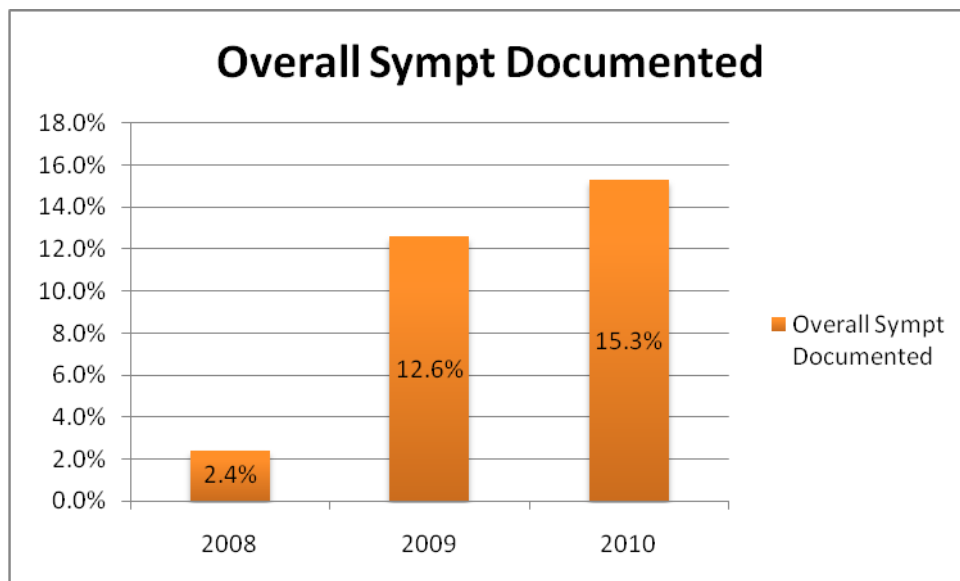


Figure 4:1 Overall symptom documentation (all 5 symptoms)

Clear documentation of diagnosis:

Diagnoses documentation revealed a clear improvement from 2008 (74%) to 2009 (94%), after the health care provider education and training. During the collection period of 2010 a remarkable percentage drop to 65% was recorded which might be due to the fact that there was no continuous education programme for this stage. Without a proper diagnosis it is difficult to get a patient to a controlled level with normal daily functioning.

4.2.2. Examination refinement

The assessment of asthma trigger factors such as a patient's smoking history, as well as that of people smoking in the patient's near vicinity is always important in order to manage and control the asthma patient. Cigarette smoking affects the way an asthma patient responds to inhaled corticosteroids (ICS) and asks for increased doses of therapy, which in its turn increases the side-effect risks (Chalmers *et al.*, 2002:226; Tomlinson *et al.*, 2005:286) and therefore requires closer monitoring. For this reason an overall (2008 – 2010) smoking history documentation rate of 44% is simply not good enough and needs serious attention. The need to address the smoking history at each patient encounter, as well as to inform the patient about the effects it has on asthma and its therapy is definitely there. Considering the percentages obtained during the individual stages, 2009 showed an improvement

(50% to 57%) while there was a drastic decrease to only 28% in 2010. This brings us to the conclusion that the need to refresh health care provider management skills through continuous education is crucial to asthma control.

Another factor that was reviewed was patient allergies. This data could not be determined for the follow-up stages, since health care providers did not inquire more than once about the patient allergies.

4.2.3. Patient control measurements

Pulmonary function of asthmatic patients in the primary health care clinics of Potchefstroom is monitored by means of peak expiratory flow (PEF) measurements. Documentation of the PEF was part of the investigation during the current study. Table 5 of article 2 (chapter 3) points out all the detail on the documentation of PEF of each year's collection. It also demonstrates the percentage of patients that reached the different levels of PEF% of the overall documented peak expiratory flows for that year.

In summary, an average of 71% (over the three years) of PEF was documented, although there was a huge decline in 2010, with only 36% documented. This result again emphasizes the role of educating and reminding the health care provider of the fact that PEF monitoring is essential with every patient encounter.

According to general asthma guidelines (GINA®) peak expiratory flow rates above 80 per cent should be achieved for good asthma control and in the current study only 0.6% of patients fell in this category. Peak expiratory flow rates above 60% indicate partial control and in this study 22% of patients were partly controlled. This would mean that measured according to PEF% only, a total of 0.6% of the patients had well controlled asthma, and depending on the associated symptoms, only 22% of them were partly controlled.

4.2.4. Prescribed medication

Evaluation of the prescribed medication during the three study periods demonstrated a good quality of health care provider adherence to the 2007 updated guidelines for the diagnosis and management of asthma (the Expert Panel Report 3) of the National Asthma Education and Prevention Programme (NAEPP) and the national Essential Drug List (EDL – See ANNEXURE A – Chapter 2).

Even the use of oral corticosteroids was well-managed (prescribed with extreme caution). A mere 3% of patients, across the 3 collection periods, received Prednisone (oral corticosteroid). For details on prescribed medication – see table 6 of article 2 (chapter 3). No evidence of dose adjustments to treatment was present.

4.2.5. Asthma action / management plans

No trace of any asthma action/ management plans was present during the first stage (baseline) of data collection. During stages 2 and 3 the patients received a copy of the document that had been completed by the health care provider (nurse), but there was no indication that treatment and patient self-management had been discussed with any of the patients. It would seem that patients merely took these documents as part of their prescribed medication charts and as proof of their clinic visit.

4.2.6. Impact of interventions

The National Heart Lung and Blood Institute (NHLBI) (NHLBI**(b)**, 2006) as well as institutions like the American Lung Association in collaboration with Minnesota Asthma Coalition (ALAMN) (ALAMN, 2010); The Californian Asthma Public Health Initiative (CAPHI) (CAPHI, 2008); and The National Respiratory Training Center (NRTC) (NRTC, 2005), all agree on the importance of educational programmes for health care providers to improve their awareness, attitude, abilities, communication application, documentation techniques and therapeutic skills about asthma in order to manage and control asthma and to reduce the effects of asthma on the patients and their families.

This study reflected the results of an educational programme and the shortcomings without it. An improvement in overall documentation was seen in 2009 following the workshop and this resulted in an improved patient control per patient count. During the third stage review, an overall documentation drop as well as an asthma control drop (if measured only by means of PEF%) was demonstrated, even with an improved chronic disease management document given to the health care provider during the third stage.

4.2.7. Relationship between quality of health-care and asthma control

In order to assess and manage asthma control, or to get behind the reason for failure thereof, the health care provider needs certain basic asthma-related information. Without this, it is difficult or even impossible to appropriately manage and control a patient. According to several other studies, on average, less than 40% of this crucial information gets documented in primary care medical records (Diette *et al.*, 2007; Yawn *et al.*, 2005; Yawn *et al.*, 2008:1). Content of clinical detail, as well as the legibility thereof, influences the quality of medical records (Wallace *et al.*, 1994:33) which then again, as has previously been mentioned, would have an influence on quality of health care and asthma control. During this study these areas were pointed out, although the clinics performed above the average. Stages 1 and 3 demonstrated a documentation rate of 54% and 51% respectively, while stage 2, during the 2009 collection period, had an improvement to 64%. For full data – See APPENDIX G (also refer to the presentation of the Dr Kenneth Kaunda District Research Day 2010, Chapter 3). From this improvement during the 2009 collection period, we can thus conclude that the documentation of asthma-related information also improved directly following the workshop/intervention.

4.2.8. Proposed interventions

The importance of a continuous educational programme for health care providers (nursing personnel and physicians) cannot be emphasised enough. Regular train-the-trainer programmes, may be based on the Provider Asthma Care Education (PACE) programme as originally developed by the University of Michigan Schools of

Public Health and Medicine, and modified by several others to meet their needs, need to be presented in order to maintain improvements in asthma care in the primary health care clinics of Potchefstroom as well as elsewhere.

4.3. Recommendations

The recommendations from the study findings can be grouped under the following headings:

4.3.1 Recognised drawbacks/shortcomings

Baddar *et al.* (2006:1438) pointed out the need for continual health care provider education programmes focused on documentation of clinical findings, PEF monitoring, checking of inhaler techniques, and follow-up dates, in order to comply with clinical practice guidelines. Considering what had been said previously about asthma, it would seem that the principles of integrative medicine as outlined by Brad Lemley (2010) sums up the entire management of asthma. He points out that this healing-orientated medicine accounts for the patient (mind, body, emotions and “spiritual force”), as well as lifestyle aspects, while emphasising therapeutic relationships. These principles emphasise aspects such as the following:

- Patient-health care provider partnerships
- Conventional and alternative methods to start up the body’s healing response
- Use of good scientific medicine, open to new concepts
- Health care provider training (commitment and self-development).

The infrastructure which to build on, with guidelines, essential drug lists and national education programmes for asthma already exists in South Africa. According to Green *et al.* (2007:174), we have the tools for effective asthma control, but are challenged by widespread implementation and the use of a control-driven strategy. Maybe it is time to change our conventional focus of “disease and treatment”, to a more integrated meaningful mission of “health and healing” (Rees & Weil, 2001:119).

An asthma documentation system / pro forma, as described by Harrop, M & Amegavie L, (2005:36) seems to be the answer to the control-driven strategy (Also see Thompson *et al.*, 2004:675, Wallace *et al.*, 1994:33, and Yawn *et al.*, 2008:1).

For primary care services to make a more positive contribution towards the management and control of asthma, it might be necessary to relate more closely with local schools and school health services (Bury *et al.*, 2007) in order to identify and diagnose children with asthma at a younger age. Furthermore, continuous educational programmes on documentation and asthma management and control need to be in place.

4.3.2 Future research

A rigorous and systematic multidisciplinary approach towards asthmatic patients or patients with asthmatic types of complaints is asked for. In order for this to happen the following suggestions can be of use:

- This study could be replicated in order to compare management and control of asthma patients in the hospital environment
- This study could be extended by including other clinics from the Dr Kenneth Kaunda Municipal District and by involving other provinces in the study
- This study could be repeated after the implementation of continuous educational programmes for the team. These programmes need to cover topics such as documentation skills, and the planning and conduction of patient self-management plans. This could assist with validating diagnosis correctness, determining triggers and other conditions, and helping with adherence.

These efforts could contribute towards improving understanding of asthma's complexity, giving meaning to other phenotypes and investigating advanced treatments with a true success potential.

4.4. Limitations (and how they were accounted for)

Limitations and shortcomings of the study included the following aspects:

- **Sampling:**

Due to general practicality and cost only a small sample of the population from a relative limited area in the Potchefstroom (Kenneth Kaunda) district could be investigated. In order to overcome this limitation, the following steps were taken:

If samples are not carefully selected, sampling bias can occur. In order to avoid sampling bias, the time of the year when the data were collected, as well as the time-span for collection stayed the same for each year group. Furthermore, the clinic records were clinic-coded and a spreadsheet was used for the collection of data. Two of the eight Potchefstroom clinics were excluded from the study due to the fact that they did not render any 'extended hours services'. In this way the researcher tried to overcome all possible sampling bias and collect a representative sample.

- **Interpretation and reporting:**

Data collection from a medical record without any patient contact made it difficult to get all the necessary information (e.g. without an age or height of a patient a PEF% cannot be calculated). The positive side of this was that it prevented the principal investigator from collecting additional data through patient communication. The data collected were therefore an accurate reflection of the data that was truly documented.

Without certain necessary documented data (as mentioned in the previous paragraph) the health care provider is unable to determine the level at which the asthma is being controlled, which makes the correct or most appropriate selection of asthma therapy merely impossible (GINA® guidelines 2008).

The data collection spreadsheet did not allow room for any changes in smoking behaviour or medication adjustments that took place from one stage to another.

The “before” and “after” intervention study design makes it difficult to solely and directly link any management changes to the interventions. The consistency in direction, the size in change, and the temporal correlation to the interventions suggest that at least an element of the changes may be associated with the interventions (Bateman *et al.*, 2001:589).

- **Timespan:**

Recordings were done over a period of three months each (May to July) of three consecutive years (2008 to 2010). Because of the intervals between recordings, perceptions and information collection could be influenced. In order to overcome this, a specific spreadsheet for data collection was implemented. Furthermore, the long stretch in time between the collection periods was planned to rule out sampling bias and to give enough time for implementing the different documents. One may, however, view it as a time during which the trained skills and documentation techniques could be lost and forgotten (as is suggested by the poorer outcome in 2010 compared to 2009 when recordings were done directly following the workshop). The question would then be whether future studies need more frequent continuous education interventions or should the recordings be done sooner after the implementation of each intervention?

- **Others:**

Other limitations to the research were the following:

- Only the second intervention document left room for accurate documentation of the frequency at which a patient experienced asthma symptoms.
- Without direct patient contact and all necessary information it is difficult to assess the accuracy of an asthma diagnosis.

4.5. Final conclusion

Asthma control in primary health care, as defined for the purpose of the study, demonstrated a positive correlation with the management (including documentation) of each asthmatic patient. Management documents were associated with enhanced documentation of asthma visit clinical notes.

Good adherence to asthma guidelines were revealed if considering the initial prescribed medication. Components, such as asthma control (through clinical history inquiring and notation) and treatment adjustments, manifested with major shortcomings and health care providers did not comply with the asthma guidelines at all. This signifies that even with the best and most comprehensive guidelines, action plans, and even medication to our disposal, we still do not automatically reach improved therapeutic outcomes as expected. Continuous health care provider education and motivation to use all of the support systems must be performed in order to make a difference.

4.6. Study reflection

Chapter 4 consisted of a summary of the results and reports of the full research project. Conclusions, limitations and recommendations on the research objectives were brought to light. Conclusions on the results and outcomes of the study objectives were made, recommendations were identified and discussed, and the limitations to the study were finally noted. Reflection on the study showed that the main objectives have been met through research.

This then concludes the study on the relationship between the management and control of asthma in primary health care.

4.7. References

1. ALAMN (THE AMERICAN LUNG ASSOCIATION OF MINNESOTA). 2010.
<http://www.lungusa.org/associations/states/minnesota/> Date of access: Oct. 2010
2. BABEY, S.H., MENG, Y. & JONES, M. 2009. Many Californians with asthma have problems understanding their doctor. Available:
<http://www.healthpolicy.ucla.edu/pubs/publication.asp?pubID=318> Date of access: Jan. 2009
3. BADDAR, S., WORTHING, E.A., AL-RAWAS, O.A., OSMAN, Y. & AL-RIYAMI, B.M. 2006. Compliance of physicians with documentation of an asthma management protocol. *Respiratory Care*, 51(12):1432-1440
4. BAILEY, W.C., HIGGINS, D.M., RICHARDS, B.M. & RICHARDS, J.M. JR. 1992. Asthma severity: a factor analytic investigation. *American Journal of Medicine*, 93(3):263-269, Sep.
5. BATEMAN, E.D., BOUSQUET, J. & BRAUNSTEIN, G.L. 2001. Is overall asthma control being achieved? A hypothesis-generating study. *European Respiratory Journal*, 17:589-595
6. BURY, M., GABE, J. & RAMSEY, R. 2007. Disability and handicap in young people with asthma. *Department of Health*
7. CAPHI (CALIFORNIA ASTHMA PUBLIC HEALTH INITIATIVE). 2008.
<http://www.betterasthmacare.org/> Date of access: Oct. 2010.
8. CHALMERS, G.W., MACLEOD, K.J., LITTLE, S.A., THOMSON, L.J., MCSHARRY, C.P. & THOMSON, N.C. 2002. Influence of cigarette smoking on inhaled corticosteroid treatment in mild asthma. *Thorax*, 57:226-230.

9. CHASSIN, MARK R., GALVIN, ROBERT W. & THE NATIONAL ROUNDTABLE ON HEALTH CARE QUALITY. 1998. The Urgent Need to Improve Health Care Quality: Institute of Medicine National Roundtable on Health Care Quality. *Journal of the American Medical Association*, 280(11):1000-1005

10. DE MARCO, R., LOCATELLI, F., SUNYER, J. & BURNEY, P. 2000. Differences in incidence of reported asthma related to age in men and women. A retrospective analysis of the data of the European Respiratory Health Survey. *American Journal of Respiratory and Critical Care Medicine*, 162(1):68-74, Jul.

11. DIETTE, G.B., PATINO, C.M., MERRIMAN, B., PAULIN, L., RIEKERT, K., OKELO, S., THOMPSON, K., KRISHMAN, J.A., QUARTEY, R., PEREZ-WILLIAMS, D. & RAND, C. 2007. Patient factors that physicians use to assign asthma treatment. *Archives of Internal Medicine*, 167:1360-1366

12. GREEN, R.J., ZAR, H.J. & BATEMAN, E.D. 2007. Asthma - is survival good enough? *South African Medical Journal*, 97(3):172-174

13. HARROP, M. & AMEGAVIC, L. 2005. Developing a paediatric asthma review pro forma. *Nursing Standard*, 19(22):33-40, 9-15 Feb.

14. HYLKEMA, M.N., STERK, P.J., DE BOER, W.I. & POSTMA, D.S. 2007. Tobacco use in relation to COPD and asthma. *European Respiratory Journal*, 29(3):438-445

15. JABER, R. 2002. Respiratory and allergic diseases: from upper respiratory tract infections to asthma. *Primary Care*, 29(2):231-261, Jun.

16. KENGNE, A.P., SOBNGWI, E., FEZEU, L.L., AWAH, P.K., DONGMO, S. & MBANYA, J.C. 2008. Nurse-led care for asthma at primary level in rural sub-Saharan Africa: the experience of Bafut in Cameroon. *Journal of Asthma*, 45(6):437-443, Aug.

17. LEMLEY, B. 2010. <http://discovermagazine.com> Date of access: Oct.2010

18. MARKS, G. 2002. Epidemiology of asthma in Australia. <http://www.asthmaaustralia.org.au/research> Date of access: Oct.2010

19. NHLBI (NATIONAL HEART, LUNG, AND BLOOD INSTITUTE) (a). 1999. Available at: <http://www.nhlbi.nih.gov/health/prof/lung/asthma/asthstat.pdf> Date of access: 18 October 2010
20. NHLBI (NATIONAL HEART, LUNG, AND BLOOD INSTITUTE) (b). 1999. Available at: <http://www.nhlbi.nih.gov/health/prof/lung/asthma/pace/index.htm> Date of access: Oct. 2010
21. NRTC (THE NATIONAL RESPIRATORY TRAINING CENTER). 2005. <http://www.nrtc-usa.org/> Date of access: Oct. 2010
22. REES, L. & WEIL, A. 2001. Integrated medicine: Imbues orthodox medicine with the values of complementary medicine. *BMJ Journal*, 322:119-120
23. RUFFIN, R.E., WILSON, D.H., APPLETON, S.L. & ADAMS, R.J. 2005. An algorithmic approach to diagnosing asthma in older patients in general practice. *Medical Journal of Australia*, 183(1):S38-40
24. SAHR (SOUTH AFRICAN HEALTH REVIEW). 2008. <http://www.hst.org.za/uploads/files/sahr2008.pdf> Date of access: Feb. 2010
25. SUBBARAO, P., MANDHANE, P.J. & SEARS, M.R. 2009. Asthma: epidemiology, etiology and risk factors. *Canadian Medical Association Journal*, DOI:10.1503/cmaj.080612
26. THOMPSON, A.G., JACOB, K., FULTON, J. & MCGACIN, C.R. 2004. Do past-take ward round proformas improve communication and influence quality of patient care? *Postgraduate Medicine*, 80:675-676
27. TOMLINSON, J.E.M., MCMAHAN, A.D., CHAUDHURI, R., THOMPSON, J.M., WOOD, S.F. & THOMSON, N.C. 2005. Efficacy of low and high dose inhaled corticosteroid in smokers versus non-smokers with mild asthma. *Thorax*, 60:282-287.
28. VOLLMER, W.M., MARKSON, L.E., O'CONNOR, E., FRAZIER, E.A., BERGER, M. & BUIST, A.S. 2002. Association of asthma control with health care utilization. *American Journal of Respiratory and Critical Care Medicine*, 165(2):195-199, Jan.

29. WALLACE, S.A., GULLAN, R.W., BYRNE, P.O., BENNETT, J. & PEREZ-AVILA, C.A. 1994. Use of a pro forma for head injuries in the accident and emergency department – the way forward. *Journal of Accident and Emergency Medicine*, 11:33-42
30. YAWN, B.P., VAN DER MOLEN, T. & HUMBERT, M. 2005. Asthma management: are GINA guidelines appropriate for daily clinical practice? *Primary Care Respiratory Journal*, 14:294-302
31. YAWN, B.P., BERTRAM, S. & WOLLAN, P. 2008. Introduction of asthma APGAR tools improve asthma management in primary care practices. *Journal of Asthma and Allergy*, 1:1-10

APPENDIX G:

Data 2008	(Per Clinic) (n=125)						
	<u>BT</u>	<u>L</u>	<u>M</u>	<u>P</u>	<u>PT</u>	<u>TC</u>	<u>Total data</u>
<u>Night symptoms (%)</u>	0	11	0	4	0	3	4
<u>Tight chest (%)</u>	0	18	8	9	20	9	12
<u>Shortness of breath (%)</u>	0	29	0	4	0	21	13
<u>Cough (%)</u>	0	18	0	17	10	15	13
<u>Wheeze (%)</u>	25	25	0	13	10	26	18
<u>Smoker (%)</u>	0	64	0	65	20	74	50
<u>Follow-up date (TCB) (%)</u>	88	86	42	87	70	88	80
<u>Peak flow (PEF) (%)</u>	0	86	100	87	85	88	82
<u>Hypertension (HT) (%)</u>	75	61	58	61	55	56	59
<u>All 5 symptoms (%)</u>	0	7	0	4	0	0	2
<u>Diagnosis (%)</u>	88	75	92	74	80	59	74
<u>Control >60% (%)</u>	0	25	8	35	29	13	22
<u>Age (mean)</u>	51	49	46	50	50	54	51
<u>PF% (mean)</u>	0	47	39	49	50	44	46

Data 2009	(Per clinic) (n=87)						
	<u>BT</u>	<u>L</u>	<u>M</u>	<u>P</u>	<u>PT</u>	<u>TC</u>	<u>Total data</u>
<u>Night symptoms (%)</u>	0	55	25	8	0	33	20
<u>Tight chest (%)</u>	0	70	17	15	8	67	28
<u>Shortness of breath (%)</u>	0	65	25	15	8	33	26
<u>Cough (%)</u>	0	70	25	27	13	33	32
<u>Wheeze (%)</u>	0	75	25	15	42	67	39
<u>Smoker (%)</u>	0	20	0	19	4	0	11
<u>Follow-up date (TCB) (%)</u>	100	100	83	88	54	67	80
<u>Peak flow (PEF) (%)</u>	0	100	100	96	96	100	95
<u>Hypertension (HT) (%)</u>	50	65	67	62	63	67	63
<u>All 5 symptoms (%)</u>	0	45	8	0	0	33	13
<u>Diagnosis (%)</u>	100	90	92	100	92	100	94
<u>Control >60% (%)</u>	0	35	17	24	31	0	27
<u>Age (mean)</u>	59	53	53	50	56	68	53
<u>PF% (mean)</u>	0	51	46	48	48	46	48

Data 2010	(Per clinic) (n=111)						
	<u>BT</u>	<u>L</u>	<u>M</u>	<u>P</u>	<u>PT</u>	<u>TC</u>	<u>Total data</u>
<u>Night symptoms (%)</u>	15	27	100	20	27	0	22
<u>Tight chest (%)</u>	3	27	100	20	27	0	18
<u>Shortness of breath (%)</u>	9	27	100	20	9	0	18
<u>Cough (%)</u>	9	27	100	20	27	0	20
<u>Wheeze (%)</u>	12	27	100	15	27	0	20
<u>Smoker (%)</u>	3	46	100	15	18	50	28
<u>Follow-up date (TCB) (%)</u>	82	96	100	85	36	75	81
<u>Peak flow (PEF) (%)</u>	18	69	100	40	9	13	36
<u>Hypertension (HT) (%)</u>	67	77	60	35	64	88	65
<u>All 5 symptoms (%)</u>	3	27	100	15	9	0	15
<u>Diagnosis (%)</u>	27	100	80	85	73	50	65
<u>Control >60% (%)</u>	0	12	20	10	0	6	19
<u>Age (mean)</u>	50	50	50	43	55	60	51
<u>PF% (mean)</u>	33	42	51	51	24	48	44