

Chapter 3:

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

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JM du Plessis

CHAPTER 3

ARTICLES

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CHAPTER 3

3.1. Introduction

An article format for *Magister Pharmaciae* in Pharmacy Practice at the Potchefstroom campus of North-West University, titled: *The relationship between the management and control of asthma in primary health care*, has been selected.

STATEMENT OF AUTHORS' CONTRIBUTION

We, the M.Pharm candidate and the candidate's Principal Supervisor, certify that all co-authors have consented to their work being included in the dissertation and they have accepted the candidate's contribution as indicated.

	Author's Name (please print clearly)	% of contribution
Candidate	Jesslee Melinda du Plessis	80
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Name/title of Principal Supervisor: **Prof Jan J Gerber**

Candidate

Date

Principal Supervisor

Date

3.2. Article 1: 'Asthma control limitations in selected primary health care clinics'

3.2.1. Article

Original Research

ASTHMA CONTROL LIMITATIONS IN SELECTED PRIMARY HEALTH CARE CLINICS

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ABSTRACT

Primary health care services worldwide are currently experiencing many quality-related problems. Efforts to improve these services appear to be sporadic and unsatisfactory. Investigations have revealed (Sharma & Sharma 2007) that one of the main causes for this state of affairs can be identified as neglected or inadequate documentation of patient/case history. The health care provider (HCP) should be equipped to improve the quality of health care and to take the lead in assuaging the predicament.

The present study was undertaken to assess the correlation between asthma control and patient-related case history notes as recorded via the HCP. The data were obtained retrospectively from the patient notes of all asthmatic patients (including children and pregnant women) who attended six selected clinics in the North West Province of South Africa (Dr Kenneth Kaunda Municipal District).

The analysis of the data collected from the patient clinic books confirmed the suspicion of poor quality of documentation, although the documentation in certain categories rendered some positive results. When compared to the GINA® guidelines, none of the patients had been controlled properly and only a small number (18.4%) had been controlled partly (GINA 2008). Asthma control may be enhanced when a standard template is developed for completion by the HCP. It is envisaged that this will ensure that vital information regarding asthma control is documented in order to contribute to satisfactory chronic disease control.

OPSOMMING

Primêre gesondheidsorgdienste wêreldwyd ondervind tans menige gehaltesdiens-gerelateerde probleme, terwyl pogings om dit te verbeter sporadies en onbevredigend voorkom. Navorsing toon (Sharma & Sharma, 2007) dat een van die hoofoorake hiervan die onvoldoende dokumentasie van die pasiënt of die geval se geskiedenis of nalating om te dokumenteer, is. Die gesondheidsorgverskaffer (GSV) moet toegerus word om die gehalte van gesondheidsorg te verbeter en leiding te neem om die verknorsing te hanteer.

Hierdie studie het die korrelasie tussen asma-beheer en pasiëntgeskiedenis, soos genoteer deur 'n GSV, ondersoek. Die data is retrospektief van die klinieknotas van alle asma-pasiënte (kinders en swanger vroue ingesluit) verkry wat die ses klinieke in Noordwes Provinsie, Suid-Afrika (Dr. Kenneth Kaunda Munisipale Distrik), besoek het.

Die analise van die data wat uit pasiënte se kliniekboekies versamel is, het die vermoede oor die swak gehalte van dokumentasie bevestig, alhoewel daar positiewe uitkomstige was in sekere kategorieë soos dokumentasie. Wanneer die dokumentasie met die GINA®-riglyne vergelyk word, is dit duidelik dat geen van die pasiënte optimaal bestuur is nie en slegs 'n klein groepie (18.4%) gedeeltelik bestuur is (GINA 2008). Asma-beheer sou kon verbeter deur 'n standaard templaet te ontwikkel wat die GSV kan voltooi. Daar word voorsien dat dit die dokumentering van die nodige inligting oor asma-beheer sal verseker en sodoende kan bydra tot die bevredigende bestuur van kroniese siektes.

INTRODUCTION

Asthma is a chronic disease of the body's bronchial (airway) tissues. This inflammatory condition afflicts millions of people worldwide (Dimond 2005:460). Despite national and international guidelines for the diagnosis and management of asthma, asthma morbidity remains a significant health problem (Stanbrook & Kaplan 2008:1099). Enhancing the quality of health care (Laurant *et al.* 2005:CD001271) can improve asthma control but, in most systems, poorly controlled asthma still imposes a considerable burden. These issues are particularly important and relevant in primary care, where most asthma cases are managed.

Several factors influence the true prevalence of asthma, namely misdiagnosis (Miedinger *et al.* 2007:1760; Nepal & Bhattarai 2008:1; Stanbrook & Kaplan 2008:1099; Tinkelman *et al.* 2006:75), poor documentation of history taking and clinical examination (Owen 2005:48), and the shortfall of a single objective diagnostic test (GINA® 2008; MayoClinic.com n.d.; Oppenheimer & Li 2006:119). A lack of awareness of achievable control and the underestimation of the significance of symptoms handicap the aim of asthma management, which is to achieve and maintain asthma control (Oppenheimer & Li 2006:119). This study was undertaken to establish the limitations in documentation (notes documented by HCP in clinics) (Liyanage *et al.* 2006:187) and the impact thereof on asthma control (Oppenheimer & Li 2006:119).

RESEARCH METHOD

A retrospective review was conducted on the clinical notes of all patients who had received treatment for chronic asthma (children and pregnant women included). The patients were those who attended six primary health care clinics in the Dr Kenneth Kaunda District of South Africa (Potchefstroom). The documentation (WHO 2007) was evaluated in order to determine the impact that proper or inadequate notes might have had on the quality and outcomes of relevant health care (Feld 2007). All the asthmatic patients who attended the above-mentioned clinics were recruited as participants, provided that they

had signed an informed consent form. The HCP managing the patient informed them about the project and the possibility of being part of it, after which the consent form was signed. Patient information remained anonymous. The Ethics Committee of the North-West University granted approval for the research to be carried out. An eight-point scale developed by the investigator was used as the method for evaluating the data. This scale looked at the physical recordings by the HCP of eight different recordable variables, i.e. variables defined as symptoms (tight chest or chest pains, shortness of breath, cough and wheezing), peak flow readings, diagnosis, smoking habits and a 'to come back' date. All variables were taken into account if documented, irrespective of accuracy.

Validity and reliability

No measuring instrument was used in this study. Data was gathered simply by collecting documented information from patient records as set out by the eight-point scale. The focus was explicitly on shortcomings regarding documentation comprehensiveness and the effect thereof on asthma control.

RESULTS

It was found from analysing the patients' medical records that an alarming 96% of the documentation was inadequate or lacking in the area of night symptoms. Only five of the patients had data recorded under 'night symptoms', and three of the five were documented as having no symptoms in this area. During the planning of the study, 'night symptoms' were deemed to be part of a nine-point measuring tool for the control of asthma. However, due to the lack of data, 'night symptoms' was not utilised as part of the measuring tool, and analyses were done on the remaining eight variables.

Of the 125 investigated patients, 80 (64.0%) were uncontrolled if a peak flow percentage of 60 was taken as a cut-off margin. The mean peak flow percentage for the patients was 46.0% (range: 17.0 to 78.0%). From these results it is also clear that none of the patients reached a well-controlled margin of 80%. For this reason the controlled versus uncontrolled benchmark was set at 60% (GINA 2008) Thorsteinsdottir *et al.* 2008:814).

Table 1 shows the percentage of documented clinical notes in each of the different categories. From this it is clear that some areas (peak flow reading, 'to come back' dates, diagnosis and smoking habits) received more attention than others. When this was investigated further it seemed that these salient areas already had a specific form for documentation purposes in the clinics. The documentation of the four symptom variables showed a particularly low figure. In fact, if the four symptoms were to be bundled together in an 'all-or-none' manner (Kelly 2007:1), data for only four patients (3.2%) could be considered fully documented.

Table 2 shows a meaningful and statistically significant improvement ($p = 0.01$) in the control of asthma (measured by means of peak flow) when the documentation of the data variables has been improved, despite the fact that four of the variables already improved due to a basic tick-box on a clinic visit form.

TABLE 1
Documented clinical notes

	%
Peak flow reading	82.4
To come back	80.0
Diagnosis	73.6
Smoking habits	49.6
Wheeze	18.4
Shortness of breath	12.8
Cough	12.8
Tight chest/Chest pain	12.0

TABLE 2
Documentation and asthma control

	UNCONTROLLED ASTHMA	CONTROLLED ASTHMA
Up to two variables documented	95.45%	4.55%
Three or more variables documented	72.84%	27.16%

DISCUSSION

Health care providers need to take appropriate action if asthma control is found to be poor (Expert Panel Report 3 2007:S94; Van Weel *et al.* 2008:997), but the results show that the opposite is happening. Sixty-four percent of the patients were uncontrolled and yet no therapy adjustments were visible. HCPs often seem to consider asthma to be controlled, even when, according to current guidelines, it is not. The level of asthma control is completely overestimated. The question is: 'Is the level of achieved asthma control a direct reflection on HCP behaviour, or merely on the misconception of asthma as an untreatable disease?' (Stanbrook & Kaplan 2008:1099).

Asthma is a chronic but treatable condition. It cannot be cured, but careful management can help avoid recurrent attacks and thereby help with control (GINA 2008). The current focus has shifted from managing severity symptoms to rather using asthma control as an outcome measure (Oppenheimer & Li 2006:119).

The use of patient records for achieving alignment with HCPs to improve patient care and ensure quality ratings tends to be a very helpful tool (Owen 2005:48; Pullen & Loudon 2006:280; Van Weel *et al.* 2008:997). If the keeping of records is not in place or done accurately, many important aspects are not mentioned and cannot be taken into consideration for future planning for management. The content of the documented notes on each HCP-patient contact was investigated. It was of inferior quality, especially in certain areas such as symptoms, and almost all of the patients were in an uncontrolled state, with minimal to no action taken to improve the situation.

Primary health care clinics suffer certain limitations, e.g. understaffing, lack of time for educational programmes, limited time per patient and other difficulties (Primary Health Care 2007). An understanding of these circumstances results in a search for alternative options by means of which to improve the HCP's clinical documentation methods.

CONCLUSION

Poor clinical patient notes (two or fewer variables documented) have been linked to both poor quality of care and uncontrolled asthmatics. The converse has also proven to be true. Good practices in clinical documentation, with more efficient and higher quality documentation, will lead to improved HCP and patient satisfaction. While we may not have the ability to affect the way HCPs practice medicine, we have the ability, and an obligation, to shape the way they document patients' information. The importance of this is that the focus should not only be on the problem identified, but should also include suggestions for improvement.

RECOMMENDATIONS

The next step would be to start working on a pre-selected, functionally designed data recording form that is specifically and carefully designed according to asthma guidelines and that will be effective in primary care clinics for quick but complete and easy notation.

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3.3. Article 2: ‘Managing asthma in primary care through imperative outcomes’

3.3.1 Article

ORIGINAL ARTICLE

Managing asthma in primary care through imperative outcomes

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Abstract

Rationale, aims and objectives To evaluate asthma management and control in primary care clinics so as to design improvements based on guideline-directed outcomes.

Methods In this study, medical records of asthmatic patients, children as well as adults, stretching over an entire lifespan, were retrospectively reviewed as a basis for assessing the level of guideline adherence and asthma control. Six primary health care clinics were visited in the Dr Kenneth Kaunda Municipal District, Potchefstroom, South Africa. All records of asthma-diagnosed patients who attended the clinics, whether for asthma-related visits or not, were reviewed during May to July 2008, 2009 and 2010.

Results A total of 323 asthma patient records were reviewed over the three time slots. The initial three-month reviewing time resulted in 125 patient files, the second collection period yielded 87 records, while the third and final time slot presented with 111 patients. All the records were clinic coded for future follow-up purposes. A suboptimal clinical asthma control picture, with a mere 16% (n=20) of females and 2% (n=3) of males with Peak Expiratory Flow (PEF) percentages above 60%, were observed in the initial assessment. Improvement in control was observed during the following time slot, but with an end result in 2010 of no PEF percentages above 60% for males and only 9% (n=7) for females.

Conclusion Over all three of the data collection periods adherence to effectively applied management of asthma guidelines proved to be below the minimum recommended clinical evaluation work-up as set out by the Expert Panel Report 3 (EPR3) of the National Asthma Education and Prevention Program (NAEPP). Applying a greater focus on essential outcomes through different disease management documents resulted in an improved quality of managed care, but still requires dedicated and continuous education and motivation. (NWU-0052-08-A5)

HCP = health care provider; ICS = inhaled corticosteroids; NAEPP = National Asthma Education and Prevention Program; PEF = peak expiratory flow

Introduction

Asthma poses a serious health problem worldwide [1,2] and is continuously increasing in prevalence [3-5]. Health care systems and expenditures are heavily burdened by asthma, including pharmaceutical costs and work- or school-related unproductivity [6,7], especially due to uncontrolled asthma [8]. Several studies considered this problem together with the complex challenges of managing and controlling asthma as it cannot be reduced to one single measurement or view [9]. Little attention has been devoted to the evaluation and implementation of more recent (2007) revised guidelines of the NAEPP, the Expert Panel Report 3(EPR3) [10] in primary care. These guidelines are designed to help with recognition of suboptimal asthma control and to improve the management of the disease. However, if various guideline-specific outcomes are adhered to, it can help to manage and control asthma. Successful practice guideline implementation can be measured by the ability to bring forth data that indicate health status improvement, based on or addressed by certain health recommendations [11,12]. The improved 2007 NAEPP revised guideline-directed care outcomes can be used by health care providers as steps towards disease control and severity management, since a large number of the population of rural areas obtain medical treatment at primary health care clinics that are mainly staffed by nursing personnel. Table 1 summarises these essential outcomes.

Table 1 Outcome essentials for proper asthma management skills

The ultimate goal of this study was to measure the outcomes after implementation of these guidelines in the primary care clinics of the Dr Kenneth Kaunda Municipal District (Potchefstroom), South Africa, and to supply useful retrospective health status data. The aim was to improve the management and control of asthma,

which could lead, after analysis of practical recommendations, to data useful for wider implementation in the treatment of asthma patients.

Methods and materials

OVERVIEW

For this three-stage, non-experimental, quantitative, repeated measures, descriptive designed study, approved by the Ethics Committee of the North-West University (NWU-0052-08-A5), Department of Health (DOH) and local government administrators, key performance measures and documented compliance were reviewed and evaluated for applicability in the setting. This setting was derived from and inspired by national and international asthma diagnosis and management guidelines. These measured outcomes were indicators in different domains, *i.e.* (1) physiologic assessment of functional symptoms and signs that are pivotal to asthma management (night symptoms; tightness of chest or chest pain; shortness of breath; cough; wheezing), (2) patient follow-up, (3) probing of exposure to environmental asthma trigger factors contributing to asthma severity (smoke exposure; other illnesses or drugs), (4) patients' response to therapy (pulmonary function monitoring), and (5) drug monitoring (medication according to guidelines).

All patient selection and data collection of the study were non-randomised and were conducted in six of the eight clinics of Potchefstroom, a rural area, forming part of the Dr Kenneth Kaunda Municipal District in South Africa. The clinics were statistically pre-selected for the purpose of this study. In order to obtain a representative sample, two of the health care clinics were excluded, since they did not render 'extended hour services' as was done by the other selected clinics. All asthmatic patients that attended

the selected clinics whether for asthma-related conditions or not, were provided with the relevant study information (verbally by means of the health care provider and in writing on the informed consent document) and were requested to voluntarily participate in the study. Candidates were also informed about their right to refuse participation or to withdraw at anytime during the study. A coding system protected each patient's identity.

Chart entries from the period May 1, 2008 to July 31, 2008 were reviewed solely by the principal investigator and used as baseline values.

Over the next year, a new checklist-format document, based on national and international asthma guidelines, was developed (e.g. see Document A). The health care providers of these clinics were then, during an asthma workshop, instructed on how to implement this document.

Document A New checklist approach asthma document

A second analysis of the patient records of the clinics in which these health care providers worked (stage 2 – See Diagram 1), based on the clinic-coded charts took place from May 1, 2009 through to July 31, 2009. Improvements were noticeable, although, overall asthma control was still unsatisfactory.

A third and final data collection period (stage 3 – See Diagram 1) followed at the same clinics, repeating the process of the first two review activities. These dates , May 1, 2010 to July 31, 2010, thus were only one year later after the May 1, 2009 to July 31, 2009 data collection period.

Study population

Patients were included based on the inclusion and exclusion criteria determined for the study.

Table 2 Study population criteria

The records of all asthma-diagnosed patients at six statistically verified pre-selected clinics of the Dr Kenneth Kaunda Municipal District (Potchefstroom), South Africa with at least 1 clinic visit were analysed during the three three-month intervals, set apart one year from each other (See Diagram 1). The number of patients that were included was restricted by the fact that no asthma clinic was held at these primary health care clinics and health care providers were limited at times, due to extreme workload. As a result no patient's medical record for the principal investigator's "study box" could be collected. The study population rendered asthma patients (n= 323) ranging from birth to death (3-81years). The male to female ratio was 1:3.

Data collection

After approval for the study from the Ethics Committee of the North-West University, Department of Health (DOH) and administrators of local clinics had been obtained, the study team searched for patients who had been diagnosed with asthma and who had had either asthma-related or -unrelated primary care clinic visits during the particular periods. These patients were fully informed about the study and agreed to participate. The health care providers obtained formal consent. Thereafter, the clinical notebooks were clinic coded to ensure nameless follow-up (e.g. PT₁ represented patient number one from Potchefstroom's town clinic). Since there was no direct patient-researcher contact and the patients could stay anonymous, none of them refused to participate.

With the administrative requirements completed, methodological research into essential fields of asthma outcomes followed, with analysis to refine the understanding of the quality of care of asthma management in the clinics. The one-year intervals between the data collections were used for an asthma workshop on health care provider

education and the implementation of the newly designed asthma patient follow-up forms.

Statistical analyses

All data were collected by the principal investigator and then captured into a spreadsheet by an independent data-capturer. Report was done by means of useful, uncomplicated descriptive statistics (frequencies and means) for individual audits. Dependent T-tests and two-way frequency tables were used to determine improvements over time, in the patients involved in all audits. Analyses were performed by using STATISTICA 9.0. StatSoft, Inc. (2009). STATISTICA (data analysis software system), version 9.0. www.statsoft.com.

Results

Description of the study

Of the 323 patients involved in the study, 28% were male (n=89). The mean age of the patients was 52 years (median=54 years), with ages ranging between 3 and 81 years. Patient records, 125, 87, and 111 from the three data collection periods respectively, were clinic coded for follow-up purposes.

Measured outcomes

During the course of this study two sets of interventions took place. The first set included a health care provider workshop and the implementation of a standardised form for documentation of guideline-based information about each asthma patient. This

took place between stage 1 and stage 2 of the study (August 1, 2008 and April 30, 2009). The second intervention period took place the following year between August 1, 2009 and April 30, 2010. A combined chronic disease management document was introduced as intervention during this interval.

Diagram 1 Process and Planning

It was clear from the results of the study that early childhood detection and diagnosis of asthma was low. Only 7 patients (2%) through all stages of the data collection were ≤ 12 years (the age boundary set by the new asthma guidelines for children). Adult diagnoses, whether correct or incorrect, were unsatisfactory in the first collection group, with a 26% rate of undocumented diagnoses, whereas the second collection group showed significant improvement with a mere 6% not documented. The last stage of the study had no educational support (workshop) and the undocumented diagnoses rose to 35%.

Documentation of symptoms was inadequate if measured against the minimum recommended clinical evaluation work-up as set out by the newly revised asthma guidelines. An average of 12% of symptoms was documented during the 2008 collection, while the 2009 collection showed an average of 29% documented. The collection period of 2010 demonstrated deterioration from 2009 although there was still an improvement on 2008, with a result of 20% documented. No symptom frequency was recorded by health care providers. Therefore therapy adjustments as recommended by the guidelines were not implemented. According to Wechsler [13] it is not only the fact that symptoms and their frequency do not feature on paper that therapy adjustments are overseen, but elements such as overestimation of control and/or symptom prevalence underestimation also play a role.

Trigger factor assessment by means of smoking history of the patient as well as that of people in the patient's near vicinity is important [14]. Therefore the overall 44% documentation rate of smoking history is not good enough. Chalmers *et al.* (2002) [15] and Tomlinson *et al.* (2005) [16] pointed out that cigarette smoking does an injustice to the way asthmatic patients respond to inhaled corticosteroids (ICS), and that smokers on ICS therapy therefore required higher doses of treatment to be effective, but then resulted in increased side-effect risks. No evidence of dose-adjustment could be found.

At the baseline (set at the first 2008 collection period – Stage 1), the mean peak expiratory flow (PEF) percentage was 46, with the median=47, and the range being 17 to 78. Age and sex variations can be viewed in Table 2.

Table 3 Age and sex variations

Table 4 Indicators documented in patient records during 2008, 2009, and 2010

Table 5 Pulmonary function monitoring (PEF)

A meagre 0.6 per cent of well-controlled asthmatic patients (PEF $\geq$ 80%) could be identified at the six selected clinics during the entire data collection period (stage 1 through to stage 3).

An average of 80% of the total data population received dates for follow-up visits (TCB). None of the initial patient records contained documentation or a copy of any existing asthma action/self-management plan as required by the guidelines, and there was no evidence of monitored inhaler techniques during any of the stages of data collection.

Looking at the medication management (pharmacotherapy) through the eye of the asthma guidelines, all asthmatic patients should receive an inhaled short-acting β_2

agonist such as salbutamol for symptom relief (as needed) and an inhaled corticosteroid (ICS) as baseline treatment (excluding mild intermittent asthma). If uncontrolled, in the primary health care setting, the ICS must be doubled and a slow-release (SR) theophylline added. Oral corticosteroids as maintenance therapy must be prescribed with extreme caution. The study found that the prescribing rate of the combination baseline treatment (salbutamol and beclomethasone) for the overall data population was 84% (n=271), while the triple therapy (theophylline added) featured around 60% (n=195). If we look at the documented pulmonary functions that reached a level of more than 60%, a total of 50 patients (22% of the documented data population) could be found. This would imply that 78% most likely had severe chronic persistent asthma depending on their symptoms, and needed to be on triple therapy. No evidence of ICS dose adjustment was depicted. Overall the medication management did not reveal significant discrepancies, even if the use of oral corticosteroids were well-managed.

Table 6 Medication management

One of the main reasons for not utilising the newly recommended form (document A) was confusion among the health care providers about using different forms for each chronic disease, as several asthmatic patients also had other chronic illnesses. This meant a separate document for each illness, which was not only time consuming, but also posed the problem of possible incomplete and inaccurate documentation. This complication drew attention to the need to design a standard combined chronic disease form (document B). Document B shows the multiple disease management and control document, designed and reconstructed by the research team, with inputs from colleagues and all the health care providers of the involved clinics. The use of this document in the Dr Kenneth Kaunda Municipal District was approved for implementation as of April 2010.

Discussion

This study is, to our knowledge, one of the first conducted in Potchefstroom, an entity of the Dr Kenneth Kaunda Municipal District, South Africa, to address health care provider knowledge about asthma, its triggers, clinical patient symptoms and control, and self-management tools placing emphasis on written asthma action plans (documentation) and guideline adherence.

Care deficiencies were identified in all realms of care. Overall, only 15% of the patients demonstrated partly controlled asthma ($PEF=60-80\%$), with 0.6% of the patients reaching the well-controlled level ($PEF\geq 80\%$) as stipulated by the 2007 updated guidelines for the diagnosis and management of asthma (the Expert Panel Report 3) of the National Asthma Education and Prevention Program (NAEPP) [10]. The lack of, or incomplete information (e.g. no PEF monitoring documented or no age supplied to calculate the PEF percentage) regarding a patient's ongoing health situation limits the knowledge on which a health care provider needs to base asthma management. In fact, undocumented outcomes as seen in this study leave gaps for unnoticed asthma symptom burdens and limited asthma control.

Since management of patients cannot feature without good tracking methods, such as regular patient follow-up visits and aided therapeutic decisions, the use of a monitoring document is of highest importance. Drs Tom James and Michael Fine (2008) [17] highlight the limitations of the use of retrospective and administrative claims data and the importance of careful symptom tracking to determine a patient's level of asthma control. They recommend a combination method for poorly controlled asthmatics. Therefore the team recommended the use of a combined document that could serve as

asthma action plan but also monitor the patient as a person possibly suffering from additional chronic conditions other than asthma together with other therapy interactions.

The newly designed document (document B), shown in Figure 3, could render a more holistic view of a patient's overall condition, which in return would grant the health care provider a clearer indication of the cause of the condition, e.g. aggravation of condition. The design of outcomes management will assist in education and support on baseline establishment, progress documentation, goal setting, and patient motivation, offering something to the “patient, provider, and payer” [18]. This document then holds diagnostic and treatment benefits leading to a targeted management approach, for example, a chronic cough of an asthmatic patient might be aggravated by the use of some hypertensive drugs that can be easily detected on this one page conclusive document.

Further improvement opportunities prevail in areas such as written action plans as self-management tools, optimising peak expiratory flow monitoring and proper history taking plus documentation thereof, and providing patients with routine follow-up dates [19]. Self-management tools in clinics ask for additional work to promote the use thereof [19]. Less than optimal asthma control can further be linked to poor adherence by both the health care provider and the patient. No information was identified on patient response towards medication adjustments (asthma action plans) in the cases of uncontrolled or partly controlled asthma, and health care provider responses were sparse. Precise, yet brisk assessment of patient therapy response and adherence should be assisted by a composite of contributing asthma control and quality of life patient-reported factors recorded by health care providers. These diverse aspects of control measurements need to be incorporated over time.

All the above-mentioned factors contribute to achieving and maintaining asthma control, which again may exercise an impact on the patient's quality of life and costs around chronic disease control. This comes to prove the importance of guideline adherence by health care provider and patient.

Guidelines, action plans and documentation are considered useful, but health care providers lack sufficient continuous education and documentation skills. The chronic disease management document that is based on the asthma management and control guidelines is particularly suitable because the health care provider can now manage the patient as a person. With full access to all necessary patient information on one page (drugs, allergies, symptoms and control of all contingent illnesses), various patient management and control difficulties may come to light.

In our opinion, in Potchefstroom and South Africa, such a chronic disease management document (document B) can be implemented as a standard tool to monitor patients in primary health care settings. Presently, however, there is a lack of dedication towards clinical notes and documentation. The guidelines are there and we have developed the instruments to improve asthma management and control, but continuous education as reminders on the completion of these forms must feature as reinforcement. We feel that the concept is feasible and provides a platform for introducing quality of care in the primary health care environment.

Conclusion

The study demonstrates sufficient opportunities for improving the quality of care for asthma patients at managed primary health care clinics. An asthma management

document was developed, tested, and considerably modified to render the easy-to-apply chronic disease management document. Each stage of the study has shown that a comprehensive approach through continuous education for health care providers and improved documentation skills may be necessary to address important care aspects through the refinement of guideline-defined essential outcomes.

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Declaration of interest

The authors report no competing interests. The authors alone are responsible for the content and writing of this paper.

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TABLES

Table 1 Outcome essentials for proper management skills

Management skills	Essentials
Ascertaining a diagnosis:	Clinical features, presence & frequency. Associated/trigger factors inquiry.
Determination of severity:	Symptom frequency. PEF (Patient height required for accurate evaluation).
Treatment initiation:	Prevention/avoidance measures together with goal setting (Education; action plans; technique monitoring; taking action on TCB dates). Pharmacotherapy.
Achieving & maintaining control:	Follow guidelines. Maintain optimal clinical records. Stepping up or down on treatment.

Table 2 Study population criteria

Inclusion criteria:

- All asthma patients (including or excluding other contingent illnesses), attending the six pre-selected provincial clinics of the Dr. Kenneth Kaunda Municipal District, Potchefstroom, South Africa,
 - Newly diagnosed or follow-up patients,
 - Male and female patients,
 - Adults and children of all ages,
 - Smokers as well as non-smokers,
 - Controlled as well as uncontrolled patients.
-

Exclusion criteria:

- Subjects who refuse informed consent.

Table 3 Age and sex variations

		2008 (n=125)	2009 (n=87)	2010 (n=111)
Age	Mean	51 yr	53 yr	51 yr
	Median	52 yr	56 yr	53 yr
	Range	3-81 yr	7-80 yr	8-80 yr
Gender	Male	30% (n=38)	25% (n=22)	27% (n=29)
	Female	70% (n=87)	75% (n=65)	73% (n=79)
	Male:Female	1:2	1:3	1:3

Table 4 Indicators documented in patient records during 2008, 2009, and 2010

Indicators	2008 (<i>n</i> =125)	2009 (<i>n</i> =87)	2010 (<i>n</i> =111)
Night symptoms (%)	4 (<i>n</i> =5)	20 (<i>n</i> =17)	22 (<i>n</i> =24)
Tight chest (%)	12 (<i>n</i> =15)	28 (<i>n</i> =24)	18 (<i>n</i> =20)
Shortness of breath (%)	13 (<i>n</i> =16)	26 (<i>n</i> =23)	18 (<i>n</i> =20)
Cough (%)	13 (<i>n</i> =16)	32 (<i>n</i> =28)	20 (<i>n</i> =22)
Wheeze (%)	18 (<i>n</i> =23)	39 (<i>n</i> =34)	20 (<i>n</i> =22)
All 5 symptoms (%)	2 (<i>n</i> =3)	13 (<i>n</i> =11)	15 (<i>n</i> =17)
Smoker (%)	50 (<i>n</i> =62)	57 (<i>n</i> =50)	28 (<i>n</i> =31)
Follow-up date (TCB) (%)	80 (<i>n</i> =100)	80 (<i>n</i> =70)	81 (<i>n</i> =90)
Hypertension (HT) (%)	59 (<i>n</i> =74)	63 (<i>n</i> =55)	66 (<i>n</i> =73)
Diagnosis (Dx) (%)	74 (<i>n</i> =92)	94 (<i>n</i> =82)	65 (<i>n</i> =72)

Table 5 Pulmonary function monitoring (PEF)

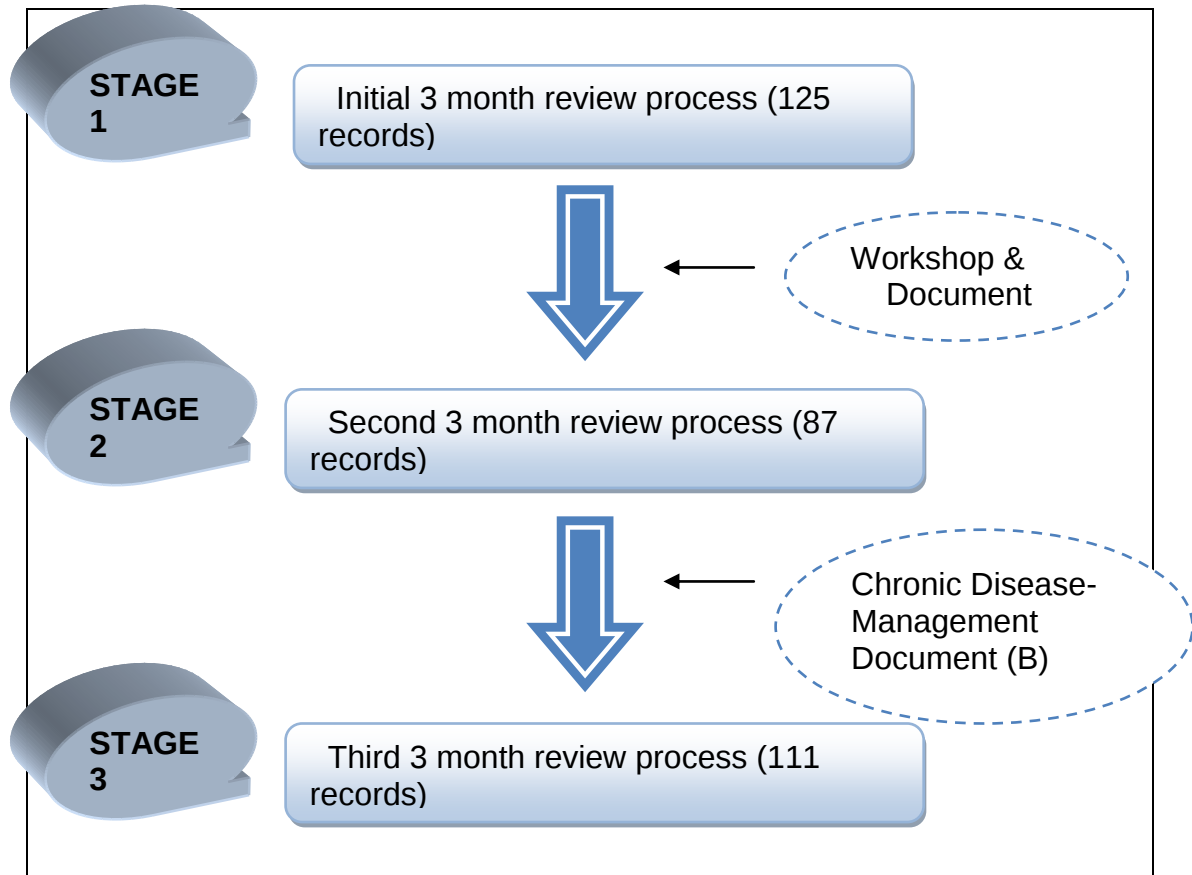
	2008 (n=125)	2009 (n=87)	2010 (n=111)
Overall PEF Documented (%)	82 (n=103)	95 (n=83)	36 (n=40)
> 60%	22 (n=23)	24 (n=20)	19 (n=7)
>70%	5 (n=5)	11 (n=9)	8 (n=3)
>80%	0	2 (n=2)	0
PEF Percentages	2008	2009	2010
> 60%: Of total male data population (%)	8 (n=3)	5 (n=1)	0
> 60%: Of total female data population (%)	23 (n=20)	29 (n=19)	9 (n=7)

Table 6 Medication management / Prescribed medication

	2008 (n=125)	2009 (n=87)	2010 (n=111)
Salbutamol (%) (inhaled short-acting β_2 agonist)	94 (n=117)	93 (n=81)	95 (n=105)
Beclomethasone (%) (inhaled corticosteroid)	83 (n=104)	87 (n=76)	87 (n=97)
Theophylline (%) (slow-release)	70 (n=87)	77 (n=67)	67 (n=74)
Predisone (%) (oral corticosteroid)	3 (n=4)	1 (n=1)	4 (n=4)
Patients receiving the combination of Salbutamol and Beclomethasone	82 (n=102)	84 (n=73)	86 (n=96)
Patients receiving: Salbutamol, Beclomethasone and Theophylline in combination	58 (n=73)	63 (n=55)	60 (n=67)

ILLUSTRATIONS

Diagram 1 Process and Planning



Document A New check-list approach asthma document

Chronic patient follow up : ASTHMA						Birth date:
Name and Surname;						
Clinic no						
Start date		M				
		F				

Date						If hypertensive, ude and CYS exam	
Medication	1	2	3	4	5**		6
Drs signature							
Qualification							
Peakflow							
Blood pressure							
Daytime symptoms more than 2X per week?	Y	N					
Wheeze	Y	N					
Night symptoms	Y	N					
Smoker	Y	N					
Limited activity	Y	N					
Technique checked	Y	N					
Date dispensed							

Date						If hypertensive, ude and CYS exam	
Medication	1	2	3	4	5**		6
Drs signature							
Qualification							
Peakflow							
Blood pressure							
Daytime symptoms more than 2X per week?	Y	N					
Wheeze	Y	N					
Night symptoms	Y	N					
smoker	Y	N					
Limited activity	Y	N					
Technique checked	Y	N					
Date dispensed							

Document B Page 1 & 2 of the combined chronic condition document

				Client nr: _____	
Asthma		COPD		Hypertension	
Epilepsy		Diabetes		Other: _____	
Name & Surname: _____				Allergies: _____	
Clinic no: _____				Male _____ Female _____	
Date of birth: _____		Length: _____			
Start date: _____		Weight: _____		BMI: _____	
Date: Seen _____				Feet, _____	
Date: Follow-up _____				Eye _____	
Medication: _____		1	2	3	4
					5 Care _____
Drs signature: _____					
Qualification: _____					
HCPs signature: _____					
BP: _____				U&E, _____	
Cholesterol level: _____				CVS _____	
Glucose level: _____				exam. _____	
PEFR: _____					
Do you experience any of these: NO / Less than 2X per week / More than 2X per week.					
Wheeze: _____					
Cough: _____					
SOB: _____					
Chest pain: _____					
Night symptoms: _____					
Normal activity: _____					
Technique checked: _____					
Fits during last month: _____				Blood _____	
Drug levels: _____				levels. _____	
Urine dipstick: _____					
Hospitalized: _____					
Pill count: _____					
Alcohol: _____					
Smoker / Snuff: _____					
Health education: _____					

				Client nr:			
Asthma		COPD		Hypertension			
Epilepsy		Diabetes		Other:			
Name & Surname:				Allergies:			
Clinic no:				Male		Female	
Date of birth:		Length:					
Start date:		Weight:				BMI:	
Date: Seen						HBA1C,	
Date: Follow-up						&	
Medication:		7	8	9	10	11	Lipo-gram.
Drs signature:							
Qualification:							
HCPs signature:							
BP:							
Cholesterol level:							
Glucose level:							
PEFR:							
Do you experience any of these: NO / Less than 2X per week / More than 2X per week.							
Wheeze:							
Cough:							
SOB:							
Chest pain:							
Night symptoms:							
Normal activity:							
Technique checked:							
Fits during last month:							
Drug levels:							
Urine dipstick:							
Hospitalized:							
Pill count:							
Alcohol:							
Smoker / Snuff:							
Health education:							

3.3.2 Author guidelines

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3.3.3 Editor permission

Article 2 has been submitted to above mentioned journal. Awaiting reviewers comment.

3.3.4 Statements

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Faculty of Health Sciences

School of Pharmacy

Clinical Pharmacology

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Subject: SUBMISSION OF A MANUSCRIPT FOR EVALUATION

Dear Editor

I am enclosing herewith a manuscript entitled "Managing Asthma in Primary Care through Imperative Outcomes" for publication in "Journal of Evaluation in Clinical Practice" for possible evaluation.

With the submission of this manuscript I would like to undertake that the above mentioned manuscript has not been published elsewhere, accepted for publication elsewhere or under editorial review for publication elsewhere; and that my Institute's (North-West University – Clinical Pharmacy) representative is fully aware of this submission.

Submitted manuscript is a Research Article

This research project was conducted from May 2008 to July 2010

Significant findings:

- Clinical evaluation work-up for asthma patients, as it is set out by the Expert Panel Report 3 (EPR3) of the National Asthma Education and Prevention Program (NAEPP), proved to be below minimum. This means that these patients cannot receive optimal management and therefore reach suboptimal control,
- Focusing on essential outcomes resulted in an improved quality of managed care,
- Sufficient opportunities for improvement of quality of care for asthma patients in primary health care clinics.

How findings of this research work are unique in their nature:

- This study is, to our knowledge, one of the first conducted in Potchefstroom, an entity of the Dr Kenneth Kaunda Municipal District, South Africa, to address health care provider knowledge about asthma, its triggers, clinical patient symptoms and control, and self-management tools placing emphasis on written asthma action plans (documentation) and guideline adherence,
- A newly designed combined document that could serve as asthma action plan but also monitor the patient as a person possibly suffering from additional chronic conditions other than asthma together with other therapy interactions could render a more holistic view of a patient's overall condition, which in return would grant the health care provider a clearer indication of the cause of the condition, e.g. aggravation of condition. The design of outcomes management will assist in education and support on baseline establishment, progress documentation, goal setting, and patient motivation, offering something to the "patient, provider, and payer". This document then holds diagnostic and treatment benefits leading to a targeted management approach, for example, a chronic cough of an asthmatic patient might be aggravated by the use of some hypertensive drugs that can be easily detected on this one page conclusive document,

In Potchefstroom and South Africa, such a combined chronic disease management document can be implemented as a standard tool to monitor patients in primary health care settings. Presently, however, there is a lack of dedication towards clinical notes and documentation.

3.3.5 Editing

EDITING	
TO WHOM IT MAY CONCERN	
<i>I hereby certify that I have edited the following:</i>	
Author :	<u>JM du PLESSIS</u>
Co-author(s):	<u>JJ GERBER</u> <u>L BRAND</u>
Title :	<u>MANAGING ASTHMA IN</u> <u>PRIMARY CARE THROUGH</u> <u>IMPERATIVE OUTCOMES</u>
<i>The final copy, after corrections and suggestions had been accepted or rejected, was not handed to me again prior to submission.</i>	
Date :	<u>10 February 2011</u>
<u>M. Terblanche</u>	
Mélanie M Terblanche (Ms) Potchefstroom	
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3.4. National presentations

SAAHIP 2008 – Poster

Documentation imperfection limits managed asthma care



Du Plessis, JM¹; Gerber, JJ¹; Van Deventer, C²

¹Clinical Pharmacy, North-West University, Potchefstroom Campus, Republic of South Africa.
²DOH Dr. Kenneth Kaunda Municipal District, North West

INTRODUCTION

Medical record documentation is important for evaluation of patient management and quality of care. Educational problems mainly on history taking and clinical documentation lead to incomplete and inaccurate clinical notes and therefore insufficient control of chronic diseases. Uncontrolled asthma is not an uncommon phenomenon and it seems that an understanding of documentation impediments will be a crucial step in identifying decisive improvement strategies.

AIM

To evaluate the quality of patient care on primary health care level, by means of assessing clinical documentation comprehensiveness and asthma control.

OBJECTIVES

This study sought to explore:

- The extent of information obtained and documented into medical records of asthma patients on primary care level,
- Any relationship between the quality of clinical notes, asthma control, and health care.

METHOD

A retrospective medical record review of all patients who received chronic asthma treatment at six primary health care clinics from the Dr Kenneth Kaunda Municipal District was conducted. The audit evaluated the availability of relevant patient disease information as tools to assess asthma control and quality of care.

RESULTS & DISCUSSION

Test prospects:

- The following to be documented in 80% of the files
 - Diagnosis
 - Peakflow reading
 - Symptoms and signs
 - Smoking/hot
 - TCB date
- 80% of all asthmatics to be controlled.

The study was conducted as a step towards understanding and improving patient-HCP interactions and ascertaining the results thereof.

The outcomes:

- Although documentation may not always reflect all the care delivered, absence of explicit documentation inhibited optimal care,
- Incomplete and inconsistent documentation lead to uncontrolled asthma.

CONCLUSION

Record keeping obligations needs to be reinforced. Good record keeping supports improved quality of care and disease outcomes by enabling efficient effective ethical performances and interventions.

A potential way to ensure full capacity documentation and asthma management might be through clear training on collecting and converging information, and introducing some asthma APGAR tools.

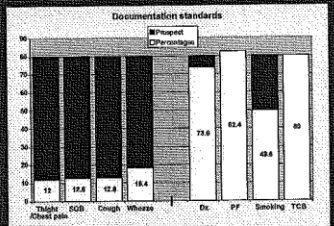
REFERENCES

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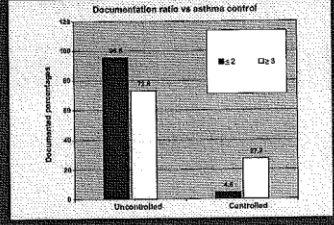
ACKNOWLEDGEMENT

The authors gratefully acknowledge:

- The support of clinic staff and all team members involved at primary health care level;
- Department of Health, Dr Kenneth Kaunda Municipal District;
- All statistical inputs received from Dr.S Ellis; and
- All personnel at North-West University, School of Pharmacy, who helped in any way.

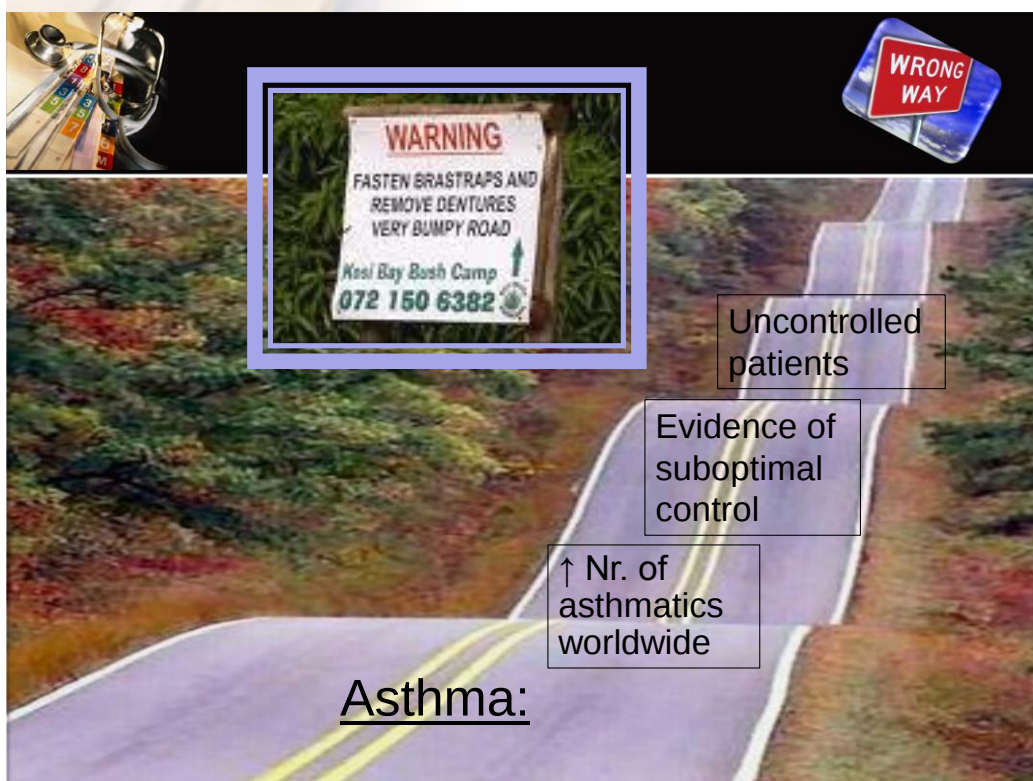
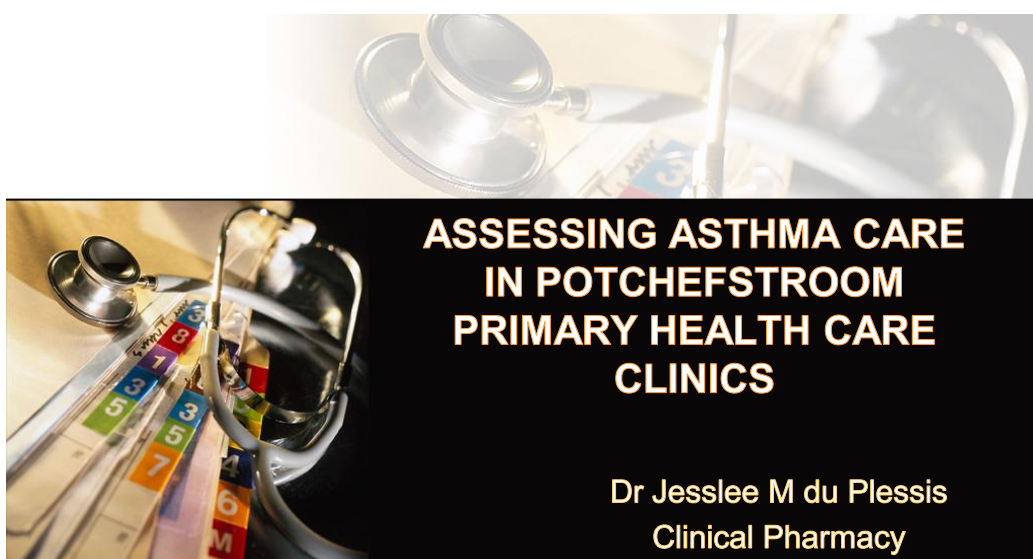


Parameter	Completed (%)	Missing (%)
Throat	12	88
SOB	19.8	80.2
Cough	12.8	87.2
Wheeze	18.4	81.6
Dc	73.8	26.2
PF	82.4	17.6
Smoking	48.8	51.2
TCB	40	60



Control Status	Completed (%)	Missing (%)
Uncontrolled	72.3	27.7
Controlled	85.2	14.8

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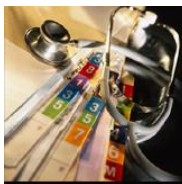
Case
record
files

Standardized
medical
notes

HCP education

Quality-of-care
indicators

Case record files



GOALS OF ASTHMA CONTROL

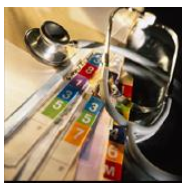
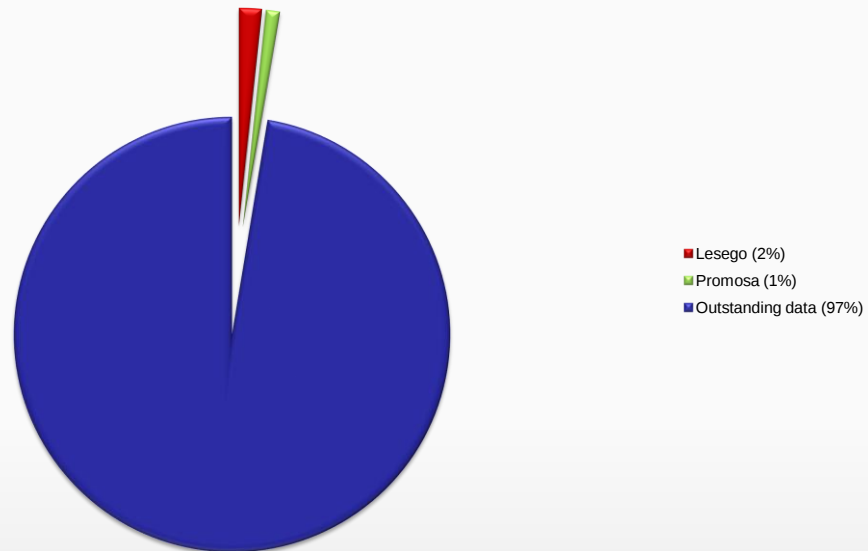
- Achieve & maintain control of symptoms,
→ document & manage
- Maintain normal activity levels,
- Maintain pulmonary function as close to normal as possible,
- Prevent asthma exacerbations,
→
 - Smoke exposure
 - Allergens
 - Drugs of aggravation
- Avoid adverse effects from asthma medication,
- Prevent asthma mortality.

(Lalloo et al. 2007:21)

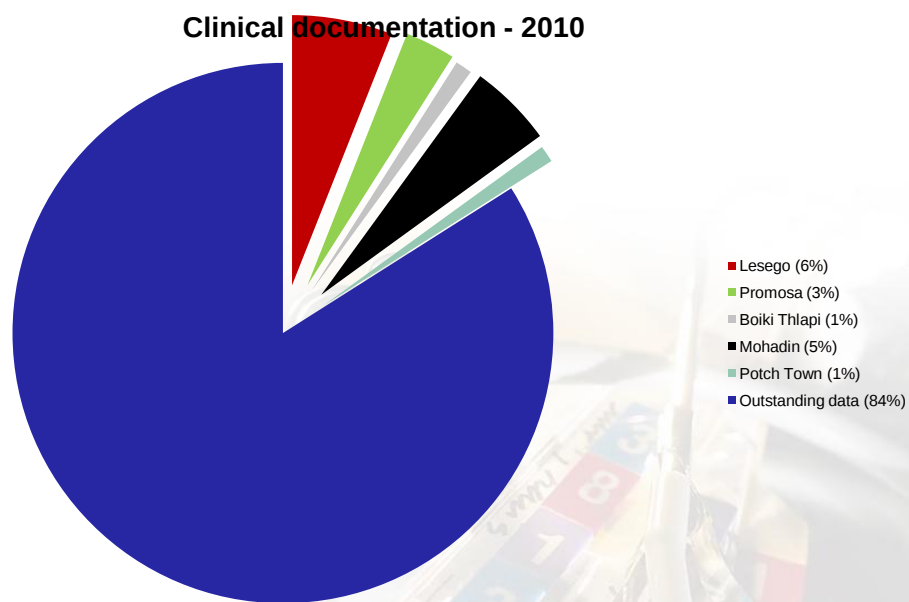


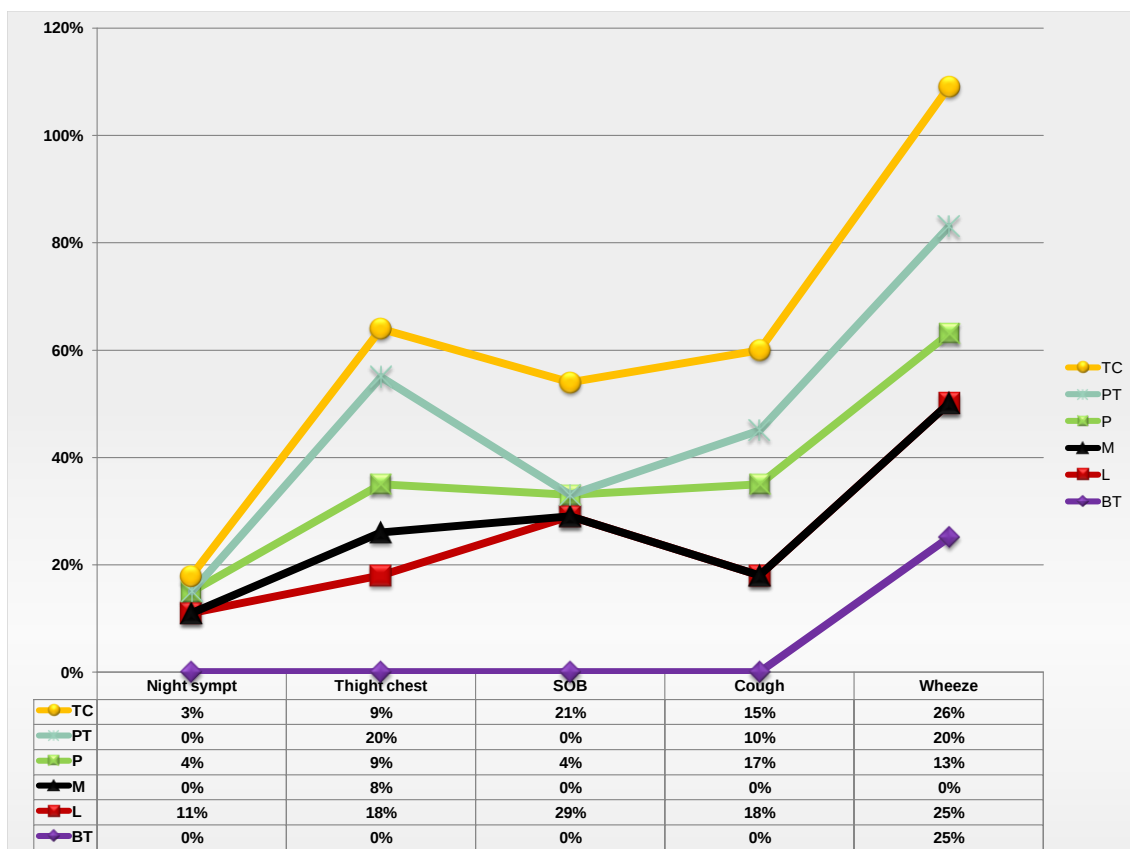
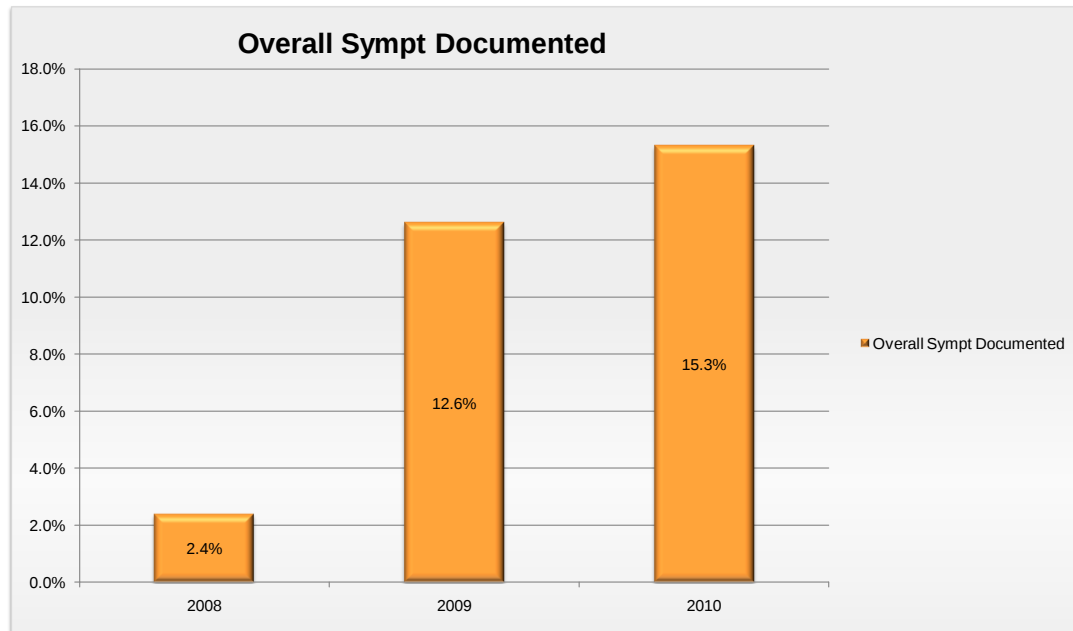
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Clinical documentation - 2010

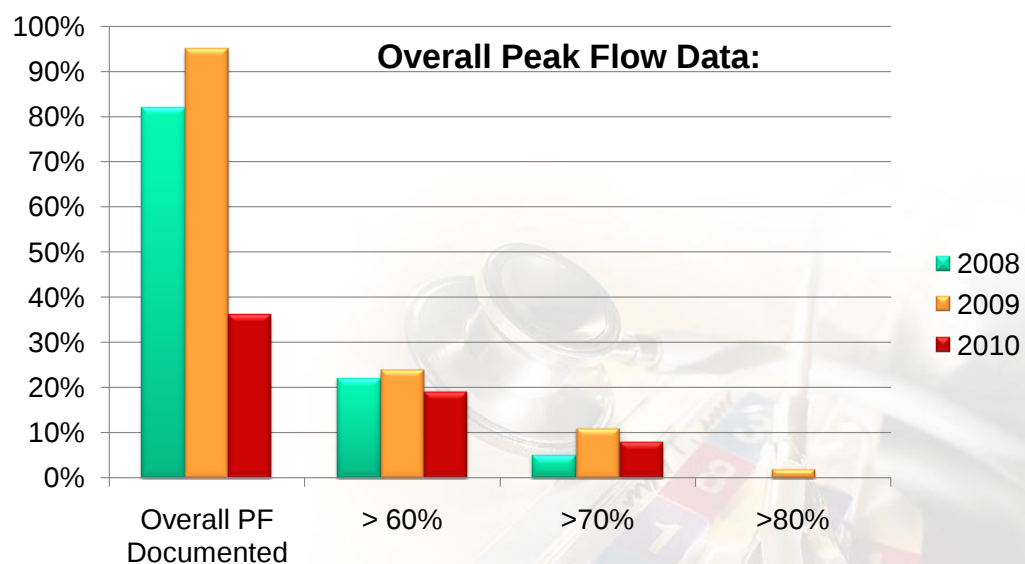
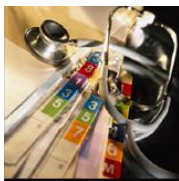
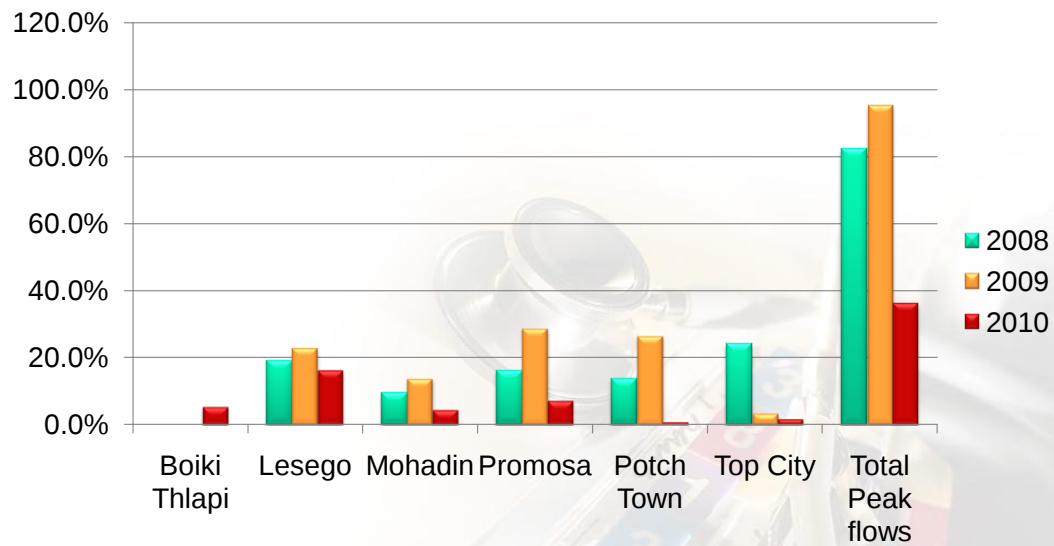






Pulmonary Function

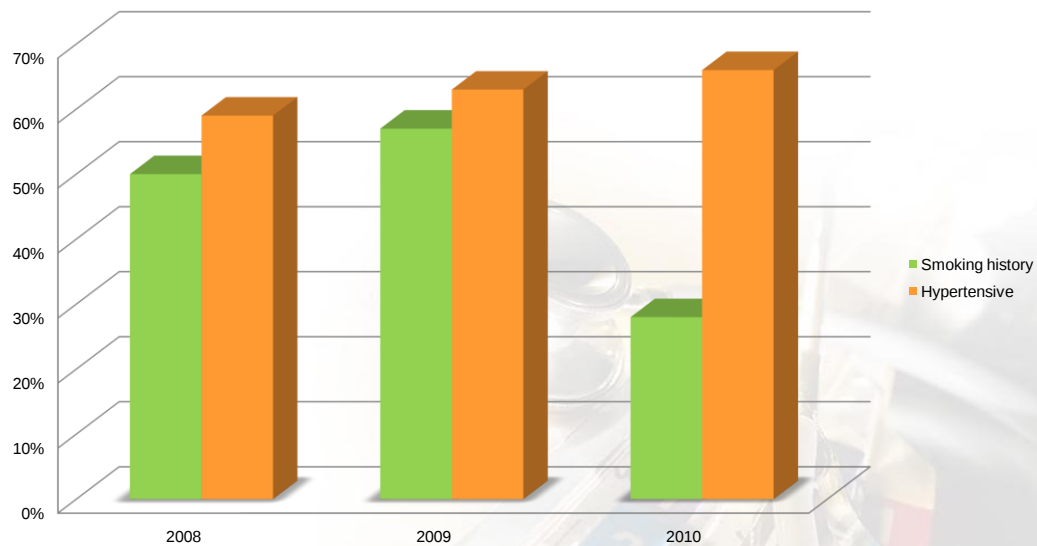
Peak flow documentation / Clinic



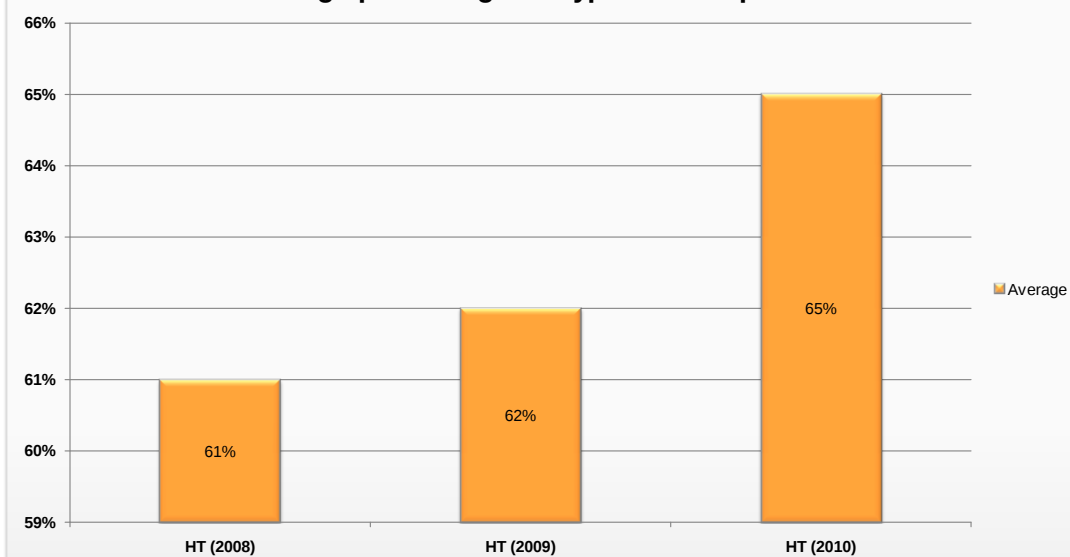


Prevention

Exacerbation Prevention



Average percentage of Hypertensive patients





**Success is not final,
failure is not fatal: it is
the courage to continue
that counts.**

Winston Churchill



DREAMS

***I may have to walk the bumpy
road of reality but I will always
allow my dreams to ride the high
winds of hope.***



Ethical considerations:

- DOH
- The North-West University Research Ethics Committee
(NWU-0052-08-S5)
- Informed Consent Form
- A study code



International presentations

ESCP 2010 - Poster

Abstract Submission for Lyon

Pharmacoepidemiology and Public Health (PPH)

ESCP10LYON-109

Asthma Care in Primary Health Care Clinics under Surveillance

J. M. Du Plessis^{1,*}, J. J. Gerber¹

¹Clinical Pharmacy, NORTH-WEST UNIVERSITY, Potchefstroom, South Africa

Is this work original?: Yes

In case that your work will be accepted for publication in the congress, please choose in which of the following ways would you like to present it: Oral communication

Introduction: As one of the world's most common lung illnesses, asthma, and even more so, uncontrolled asthma, places a sizeable onus on health care systems and expenditures. Management and control of asthma provide even more challenges, since no single view or measurement can be coupled to it. Recognition of substantial asthma control and implementation of practice guidelines can however lead to improved disease management. The objective for the study was to evaluate the fulfilment of therapeutic goals as set out by science-based guidelines for diagnosis and management of asthma, thereby contributing to improved managed health care through implementation of proper management skills.

Materials & Methods: Retrospective evaluative study; reviewing medical records of asthmatic patients for specific outcome measures; two time frames of 3 months each, 6 months apart (May – Jul 2008 and Feb –Apr 2009).

Six statistically verified pre-selected local primary health care clinics in the Dr Kenneth Kaunda Municipal District, Potchefstroom, South Africa.

Essential quality measures, focusing on health care, provider care and patient health status, were selected as reflectors of quality of care. Clinical activities feasible for monitoring in this context were: diagnosis; patient follow-up; severity symptoms, as well as trigger- and co-morbid condition consideration.

Results: A total of 212 eligible patient records were reviewed over the 2 time frames. Quality measures depicted the following outcomes for the different time intervals: 74% and 94% had a documented asthma diagnosis; 80% of patients were given follow-up dates in both intervals. Care deficiencies came to light in the areas of symptom enquiring, trigger factor and co-morbid condition considerations, with percentages varying from 4% to 22%.

Discussion, Conclusion: The data obtained assist as a guide for health care providers to institute change for the purpose of ensuring optimal patient outcomes, thereby advancing health and quality of life by bridging the current knowledge and best practice gap.

Bibliographic references: 1. Apter AJ, Van Hoof TJ, Sherwin TE, Casey BA, Petrillo MK, Meehan TP. Assessing the quality of asthma care provided to Medicaid patients enrolled in managed care organizations in Connecticut. *Ann Allergy Asthma Immunol* 2001 Feb;86(2):211-8.
2. Coffey RM, Ho K, Adamson DM, Matthews TL, Sewell J. Asthma care quality improvement: A resource guide for State action. AHRQ publication no. 06-0012-1, April 2006.

Keywords: Asthma, Clinical outcomes, Implementation, Management skills, Quality of care

Correspondance

From: "ESCP 2010 ABS" <escp2010abs@mci-group.com>
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Subject: ESCP Lyon 2010 - Abstract acceptance - Poster

ESCP Annual Symposia
Clinical Pharmacy at the front line of innovations
21 - 23 October 2010, Lyon, France

Dear Jesslee DU PLESSIS,
Your Abstract number: ESCP10LYON-109
New Abstract number: PPH-13

We are happy to inform you that your abstract "Asthma Care in Primary Health Care Clinics under Surveillance" on the topic "Pharmacoepidemiology and Public Health (PPH)" has been accepted for Poster Discussion Forum Presentation during ESCP Annual Symposium, to take place in Lyon, France from 21 - 23 October 2010. This implies that you should present a poster during the symposium.

Poster Display

You are requested to mount your poster between 09:00 and 10:00 on Thursday 21st of October in the Poster Area at the Symposium venue, the Centre de Congrès de Lyon. All poster boards are assigned a poster number. This number is the same as the one you find on the top of this email, and it can also be

found in the author's index in the Final Programme & Abstract Book. Materials for mounting the posters will be provided by the symposium organisers.

Poster Size

The board size is 1m wide by 2m high. The recommended size of the poster is 90 cm wide by 160 cm high (portrait orientation). Please note that poster in landscape orientation or exceeding these measurements will not be accepted. The recommended size for the posters is A0 format (84 cm x 118 cm).

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Presenters are expected to be present at their poster during all coffee breaks. On Saturday 23 October, the posters can be removed between 15:00 and 16:00. Posters not removed at the dismantling deadline, Saturday 23 October 16h00 will be removed and destroyed!

Please note that there will be poster awards for the best posters.

Reviewer Comments

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Please remember that registration for the ESCP Annual Symposia Lyon 2010 is mandatory for the publication of your abstract in the Final Programme and Book of Abstracts of the symposia, and for inclusion in "Pharmacy World and Science", the scientific journal of the Society

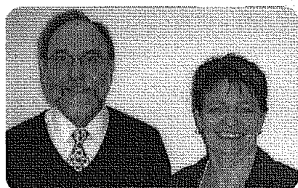
The deadline to register for the Symposium at the EARLY BIRD fee is 15th September 2010. If you have not registered by 15th September 2010 your abstract(s) will be regarded as withdrawn.

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We look forward to welcoming you in Lyon.

Kind regards, Marie-Caroline Husson, Chair of the abstracts review process ESCP-SFPC Lyon 2010

Asthma Care in Primary Health Care Clinics Under Surveillance



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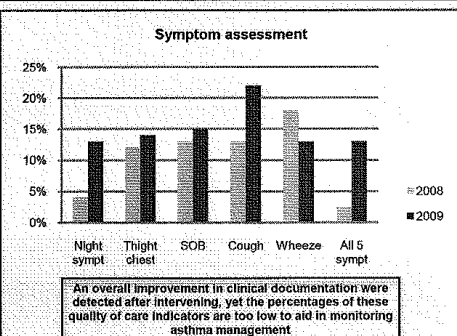
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INTRODUCTION

As one of the world's most common chronic respiratory diseases, asthma, and even more so, uncontrolled asthma, places a sizeable burden on health care systems and expenditures.

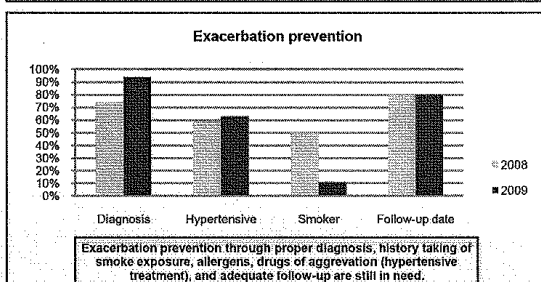
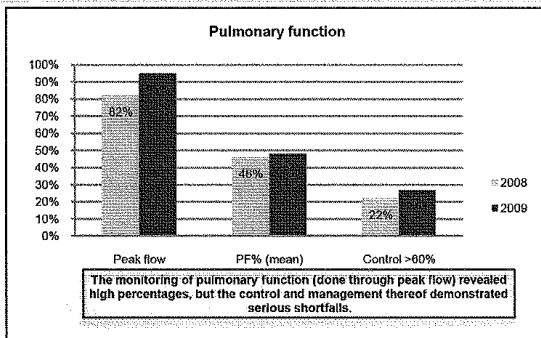
Management and control of asthma provide even more challenges, since no single view or measurement prove to be successful. Although it is incurable, it is highly treatable, and therefore the recognition of substantial asthma control and the implementation of practice guidelines can lead to improved disease management.

Goals of Asthma Control (Selected Results)		
	2008	2009
Sex	M = 30% (38)	M = 25% (22)
	F = 70% (87)	F = 75% (65)
Age	50.54	53.11
Symptom assessment	2%	13%
Pulmonary function	46%	48%
Activity levels	<1%	<1%
Other control goals	HT = 59%	HT = 63%
	TCB = 80%	TCB = 80%
	Dx = 74%	Dx = 94%
	Smoker = 50%	Smoker = 11%



METHODS

Clinical records of all asthmatic patients attending six statistically pre-selected primary health care clinics in Potchefstroom, an entity of the Dr Kenneth Kaunda Municipal District, were retrospectively reviewed. Quality of care indicators that could aid in the monitoring of asthma management were reviewed. A workshop was conducted, to improve the health care provider's knowledge on asthma, as well as to communicate the latest asthma management guidelines and standardized clinical documentation. A record review followed in 2009.



DISCUSSION

A total of 212 eligible patient records were reviewed over the 2 timeslots. Quality measures depicted the following outcomes for the different time intervals: 74% and 94% respectively had a documented asthma diagnosis; 80% of patients were given follow-up dates in both intervals. Care deficiencies came to light in the areas of symptom enquiring, trigger factor and co-morbid condition considerations, with percentages varying from 4% to 22%.

CONCLUSION

The data obtained assist as a guide for health care providers to institute change for the purpose of ensuring optimal patient outcomes, thereby advancing health and quality of life by bridging the current knowledge and best practice gap.