

A COMPARISON OF THE QUALITY OF CHRONIC CARE OF HYPERTENSIVE PATIENTS ATTENDING A FAST LANE CLINIC VERSUS A STANDARD CLINIC IN DITSOBOTLA SUB DISTRICT, NGAKAMODIRIMOLEMA DISTRICT IN NORTH WEST PROVINCE IN SOUTH AFRICA.



Dr SPMampe-Tembo, MBCHB (MEDUNSA), Registrar MFAMMED (University of Stellenbosch).

Dr.Njie-Principal Specialist Family Physician, NgakaModiriMolema District. North West Province, South Africa.

Prof Julia Blitz, Division of Family Medicine & Primary Care, Stellenbosch University

“Declaration

I, the undersigned, hereby declare that the work contained in this assignment is my original work and that I have not previously submitted it, in its entirety or in part, at any university for a degree.

Signature:

Date: 30.07.2012

ABSTRACT

Background

Ditsobotla Sub district is in NgakaModiriMolema District, North West province, South Africa. Patients with chronic diseases in the sub district are mainly taken care of at the clinics. There are two types of clinics that cater for chronic patients – fast lane and standard clinics. Fast lane clinics cater for patients with chronic diseases and family planning only whilst standard clinics cater for acute illnesses, chronic patients and family planning.

Fast lane clinics were started because of dissatisfaction of chronic patients as a result of long waiting times. There were no standardised guidelines for the establishment of fast lane clinics. This study attempted to compare the quality of care given to patients between fast lane and standard clinics.

Methods

This was a cross sectional descriptive study using a validated audit tool from Western Cape, Department of Health to assess facilities and patients folders. There were 145 and 55 files from fast lane and standard clinics respectively which were audited using systematic sampling. Selected patients needed to have been attending either of the clinics for hypertension treatment from January to December 2010.

Results

The patients at the standard clinic had better adherence to their appointments than fast lane clinic ($p < 0.05$). The standard clinic was doing much better than fast lane clinic in counseling of diet, exercise, smoking and alcohol ($p < 0.05$). The recording of blood pressure and body weight was better at the standard clinic than fast lane clinic ($p < 0.05$).

Fast lane clinic have more patients with well controlled blood pressure, normal creatinine level and normal random cholesterol than standard clinic ($p < 0.05$).

The differences in the findings on the facility audit regarding equipment and processes are not statistically significant ($p > 0.05$).

Conclusion

Fast lane clinic has better outcomes and thus quality of care than standard clinic therefore maintenance and expansion of this type of clinic in Ditsobotla sub district may be of value.

INTRODUCTION

Ditsobotla Sub district is in NgakaModiriMolema District in North West province in South Africa. There are three community health centres, two 24-hour clinics and twelve 8- hour clinics. Patients with chronic diseases in the sub district are mainly taken care of at the clinics. There are two types of clinics that cater for chronic patients – fast lane and standard clinics. These clinics were in separate clinic buildings, but now some of them are in the same building. The fast lane clinic in this study is in its own physical building.

Fast lane clinics cater for chronic patients and family planning only. Standard clinics cater for acute illnesses, chronic patients and family planning. Both are nurse led services. A patient who presents with other types of problems in the fast lane clinic on their hypertension appointment would be referred to a standard clinic.

Fast lane clinics were started because of dissatisfaction of patients with chronic diseases as a result of long waiting times. They had to wait in long queues at standard clinics on a monthly basis. In our setting, the implementation of fast lane queues for chronic medication was introduced to ensure patients are attended to within an acceptable period of time and in accordance with their needs. When they started attending fast lane clinics they were happy because of the speedy service they received. There were no standardised guidelines for the establishment of fast lane clinics. There were even no specific criteria used to assign patients from the nearby standard clinic to fast lane, every hypertensive patient who used to attend standard clinic was transferred to fast lane clinic. It is of importance to note that a larger number of fast lane clinic patients used to get their treatment from the hospital and were treated by doctors and down referred to the clinic only when their blood pressure was controlled, whereas a larger number of standard clinic patients' treatment was initiated by the nurses.

I was employed in the sub district in 2007. When I started attending to patients with chronic diseases, I realised that some of the poorly controlled hypertensive patients had been visiting fast lane clinic every month. There was no proper intervention by attending nurses, patients' treatment was not amended even if their BPs were not controlled, and I was not sure if this was because of speedy service or if it was the same at all clinics. I had an impression that fast lane clinic patients received treatment that is sub-standard than standard clinic patients and I needed to establish whether that was true.

All patients should be given good quality care in every clinical setting and there is a very good National guideline on hypertension management which was published in 2006.¹ Every health care worker should adhere to this guideline when managing hypertensive patients to prevent target organ damage; and it correlates with the 2008 Essential Drug List (EDL) approach to hypertension.²

Non communicable diseases (NCDs) are the leading cause of death globally; 52 million deaths in 2008 were caused by NCDs. Cardiovascular diseases contributed to 39% of deaths caused by NCDs and annual

cardiovascular diseases mortality is projected to rise by 6 million by 2030.³ Hypertension is a costly and major contributor to cardiovascular disease and the national guideline was developed to promote evidence-based, accessible, and comprehensive management of hypertension by health care professionals in the public and private sectors.¹ It has been identified that there is need for community clinics to have an organised system of regular followup and review of their hypertensive patients. Primary health care services should be the stronghold of hypertension control.⁴ Primary care for patients with hypertension at public sector Community Health Centres is suboptimal. There are deficiencies in level of care with unrecorded complications as well as suboptimal blood pressure (BP) control.⁵

In the United Kingdom, nurse led clinics are more effective in managing blood pressure in patients with diabetes mellitus than conventional clinics. Achievement of target systolic blood pressure occurred three times more often than in patients who were receiving nurse led care than conventional care in a study done in Whittington Hospital in London.⁶ Both fast lane and standard clinics are nurse led therefore we can't blame any discrepancy in quality of care on the nurse led approach. In terms of process of care that hypertensive patients receive, characteristics of both the patient and the healthcare system in which they are given their medical care have been implicated in poor blood pressure control.⁷ While there is a strong evidence-base for the benefits of antihypertensive drug therapy, there is little evidence how care for hypertensive patients should be organised and delivered in primary care.⁸ The primary healthcare package for South Africa provides a set of norms and standards. This package has clearly outlined the norms and standards that need to be followed when establishing a primary health care institution that serves hypertensive patients.⁹ The primary health care package is similar to Essential Drug List for Primary Health Care in that they both aim at detection, management and control of hypertension as well as preventing target organ damage. Lack of practice organisation, coupled with failure to intensify treatment has been characterised as 'clinical inertia' and is implicated as a reason of failure to achieve treatment goals in hypertension, diabetes and secondary prevention of coronary heart disease.¹⁰

In Saudi Arabia, an audit of two primary health care centres was done, and revealed that the process of hypertension care at the two primary health care centres in Aseer Region was not in accordance with recommended national guidelines. The reason for this included lack of updating system, recall system and essential lab investigations.¹¹

The 2006 South African Hypertension guideline is based on absolute risk for cardiovascular diseases and not just on blood pressure level. This hypertension guideline is both more effective at saving lives and less costly than those based predominantly on a blood pressure level.¹² The problem with this guideline is it doesn't deal with patients' matters like adherence to therapy and tolerability of lifestyle modification. These are issues that cannot be overlooked when managing hypertensive patients. Empowerment of the patients to actively become involved in the management of their hypertension is the major objective in managing patients with hypertension.⁴

The aim of this study was to investigate whether there is a difference in quality of care given to patients between fast lane and standard clinic in Ngaka Modiri Molema, North West Province by:

1. Comparing whether consultation rooms have all the equipment necessary for care of hypertensive patients.
2. Comparing adherence to the national guidelines on Management of Hypertension.
3. Comparing adherence to hypertension scheduled appointments in hypertensive patients.
4. Comparing the facilities' chronic care processes.
5. Comparing outcomes between two facilities.

METHOD

This was across sectional descriptive survey, obtaining information on quality of care and patients' scheduled hypertension visits from patients' files and auditing facilities for necessary equipment.

Fast lane clinic has 1152 hypertensive patients who are seen per month whilst standard clinic has 437 hypertensive patients. The sample size was determined by a statistician at University of Stellenbosch to use 80% power to detect a 15% difference in estimation of any two proportions. A systematic sampling frame selecting every fifth patient folder in the hypertensive registers was used, resulting in 145 files from the fast lane clinic and 55 files from the standard clinic.

The 8 hour fast lane clinic used was selected because it was the longest established fast lane clinic in the district and the 8 hour standard clinic was selected because it has more patients than other 8hour standard clinics and I was also avoiding to use any clinic where I had worked because that might influence the results. The study population was hypertensive patients who attended either of the two clinics from January 2010 until December 2010.

The hypertension section of the integrated audit tool for chronic disease management from Western Cape, Department of Health was used¹³. The criteria used to assess quality of care are based on the Metropolitan District Health System (MDHS) Chronic Diseases Record Sheet and evaluates the management of Hypertension. There are 2 components to this audit; the first part looks at the facility's equipment available for the condition (Table I) and the second part is a folder review for hypertension (Table II).

Facility audit was done by checking equipment and chronic care processes in each clinic.

Table I Criteria for facility audit

Criterion	Measurement	Standard
Chronic Care consulting rooms equipment	Standard BP cuff, obese BP cuff, baumanometers, chronic disease of lifestyle stationery, foot screening forms, BMI chart or wheel, ophthalmoscope, access to EDL and hypertension pamphlets	Equipment counted must be present and visually confirmed. All equipment counted must be working properly.
Vital room equipment	Functioning scale, tape measure,	Equipment counted must be

	height chart, urine dipstick, glucometer and glucostix	present and visually confirmed. All equipment counted must be working properly.
Facility access	Access to monofilaments for foot exam, Snellen chart for literate and illiterate, Life flip chart, pinholes and ECG machine.	Equipment counted must be present and visually confirmed. All equipment counted must be working properly.
Chronic care processes	Facility uses a chronic disease register, uses a central dispensing unit, have a chronic care team, have hypertension group health education, does therapeutic groups using a LIFE flip chart and have community based support groups	Some processes can be seen in the facility while some should be verified in a register

The folder review was done by collecting data on the following criteria.

Table II Criteria for folder review

Criterion	Measurement	Standard
Scheduled visits	Total number of hypertension visits in that year	12 scheduled visits per year
Counseling	Diet, exercise, smoking and alcohol	Evidence of counseling in record once a year
Record of BP	Number of visits where BP was recorded	Every visit
Record of body weight	Number of visits where body weight was recorded	Every visit
Annual recordings	Body mass index (BMI) or waist Circumference(WC), Urine dipsticks for proteinuria, Resting ECG, Random total cholesterol, Serum Creatinine.	Evidence of recording once a year
Intermediate Outcomes:	The last measurements for BMI or waist circumference; Blood pressure; Random total cholesterol and Serum Creatinine	Within the audit limits described on the tool. (BMI <25, WC < 102cm(males) or 88cm(females), BP<140/90, Random total cholesterol<5, Creatinine<120

The tool then compares the findings with the pre-determined standard. All reference ranges are from 2006 SA National Hypertension Guidelines.¹ Lastly the data for the standard and fast lane clinics were compared

STATISTICAL ANALYSIS

Statisticaversion10 (2012) software was used to analyse data. Mann- Whitney U test was used to compare independent variables. Pearson Chi square was used to compare observed frequencies.

ETHICAL CONSIDERATION

1. Informed consent

A waiver of informed consent was granted by the Health Research Ethics Committee of Stellenbosch University (S11/10/015).

2. Privacy and confidentiality

Confidentiality was maintained by assigning numbers to study participants and keep the key to the numbers separate. No patient identifiers were on the study record form.

Privacy was maintained by only allowing me and the professional nurse who was the co-investigator to go through patients' records. This data was a collected retrospectively.

3. Standard of care

The clinic staff were informed of patients who had uncontrolled BP or complications which were never attended to, for further care.

Permission to conduct the study was granted by the Director of Primary Health Care Services, North-West Province.

RESULTS

The study did not include demographic information of patients studied.

The patients at the standard clinic had better adherence to their appointments than fast lane clinic ($p < 0.05$). See table III.

Table III Average number of visits per year

	STANDARD CLINIC (n=55)	FAST LANE CLINIC (n=145)	p-value
AVERAGE VISIT PER PATIENT	10.7	9.5	0.000005

Table IV shows that more patients at the standard clinic received counseling than patients at fast lane clinic.

Table IV Percentage of folders where there was evidence of counseling

	STANDARD CLINIC (n=55)	FAST LANE CLINIC (n=145)	p-value
DIET	69%	45%	0.00217
EXERCISE	67%	40%	0.00056
SMOKING	67%	40%	0.00056
ETOH	67%	40%	0.00058

The recording of blood pressure and body weight was better at standard clinic than fast lane clinic ($p < 0.05$). Fast lane clinic had better recording of total cholesterol, creatinine, proteinuria, and BMI ($p < 0.05$). The difference in the recording of resting electrocardiogram (ECG) is not statistically significant ($p > 0.05$), patients in both clinic have no access to the ECG machine. See table V

Table V Percentage of folders where these parameters were recorded

	STANDARD CLINIC (n=55)	FAST LANE CLINIC (n=145)	p-value
BLOOD PRESSURE	100%	98%	0.000002
BODY WEIGHT	98%	97%	0.000034
RANDOM TOTAL CHOLESTEROL	11%	34%	0.00121
CREATININE	11%	28%	0.00970
PROTEINURIA	0%	36%	0.00000
RESTING ECG	0%	1%	0.38137
BMI	5%	15%	0.00000

It is of importance to note that fast lane clinic have more of their patients with well controlled blood pressure, creatinine level and random cholesterol than standard clinic ($p < 0.05$). Standard clinic patients are only better controlled than fast lane clinic with regard to body mass index ($p < 0.05$). See table VI.

Table VI Percentage of folders where treatment goals are meeting targets

	STANDARD CLINIC (n=55)	FAST LANE CLINIC (n=145)	p-value
LAST BP READING < 140/90	42%	77%	0.00001
BMI < 25 OR	26%	18%	0.00000

WC<102CM(M) <88CM(F)			
RANDOM TOTAL CHOLESTEROL <5	33%	37%	0.00528
CREATININE<120	83%	90%	0.03227

The differences in the findings on the facility audit with regard to equipment and processes are not statistically significant ($p>0.05$). See table VII

Table VII Summary of facility audit

	STANDARD CLINIC (n=55)	FAST LANE CLINIC (n=145)	p-value
EQUIPMENT	15%	6%	Not significant
PREP ROOM	100%	83%	Not significant
FACILITY PROCESSES	29%	0%	Not significant
CHRONIC CARE PROCESSES	40%	20%	Not significant

DISCUSSION

This study aimed to investigate whether there is a difference in quality of care between patients receiving hypertension treatment at a fast lane clinic and standard clinic. In this study, consultation rooms at both clinics seem not to have adequate equipment. There was generally poor availability of standard equipment in both facilities and this might be a reflection of the district health system.

In this study recording of BP was 100% (standard clinic), 98% (fast lane clinic) ($P<0.05$) which is similar to Cape Peninsula (98%), Saudi Arabia (100%).^{5, 12} The recording of body weight was 98% (standard clinic) and 97% (fast lane clinic) ($P<0.05$). The lesser recording of blood pressure and body weight at fast lane clinic was most probably due to the speedy service.

11% (standard clinic), 34% (fast lane clinic) of folders audited had recordings of random total cholesterol and this is below the findings in Athens (53%), Saudi Arabia (71%, 40%) but higher than Cape Peninsula (3.4%).^{5, 12, 14} In this study 11% (standard clinic), 28% (fast lane clinic) of folders creatinine were recorded, in Athens (62%) and in Saudi Arabia (64%, 30%).^{5, 12} The above finding shows standard clinic adhere to the National guidelines more than fast lane clinic, this might be because the emphasis at fast lane clinic is more about treating patients faster.

In this study 77% of patients attending fast lane clinic and 43% of patients attending standard clinic were having well controlled blood pressure ($BP<140/90$) ($P<0.05$). The reason for this may be because most fast lane clinic were treated at the hospital by doctors before and their BPs were well controlled before down referral to fast lane clinic, whereas most patients at standard clinic had their treatment initiated at the clinic by nurses. These findings on % of patients with well controlled blood pressure were better than those reported in Cape Peninsula (33%), many clinics throughout the United States (33%),

Belgium(31%).^{5,14,15,16,17,18,19,20,21}A study done in North West Province showed that control of hypertension varied between sites, from 16% to 60%.²²In Saudi Arabia, 63% of patients were having well controlled blood pressure.¹²The study shows that fast lane clinic has better outcomes than standard clinic.

The result from this study on average visit is surprising. One of the major goals of setting up fast lane clinic is that patients are expected to spend less time at the facility. This reduced waiting time is envisaged to encourage regular attendance of patients at fast lane clinic to collect their medication. On the contrary patients at standard clinic may be delayed by high volume of patients and consultation processes that prolong patients stay at the clinic and may be a barrier to regular visits to the clinic. However it is beyond the scope of this study to explain this unexpected outcome. It would need further investigations to determine factors that are important barrier to regular visits to fast lane clinic. This may indicate that there are other issues beyond faster service that contribute to compliance to collection of medicine, but this study could not determine those factors. In addition to forgetting appointments patients have provided several reasons for no-shows. Logistical issues include trouble getting off work, child care, transportation, and cost. In addition, both patients who felt better and patients who felt too unwell to come failed to show.²³Other studies showed that other strategies that improve adherence to treatment include mail; telephone and physicians reminders.²⁴

The evidence of counseling on exercise, smoking, alcohol and diet was better done at standard clinic than in fast lane clinic; however the quality of counseling could not be assessed during the folder review. Every hypertensive patient should be counseled on these aspects; otherwise the management of hypertension is incomplete. These facilities differ in their patients' processes and this result in patients at standard clinic having more time during consultation than patients at fast lane clinic due to orientation of a quick service at fast lane clinic. This might impact negatively on fast lane patients in the long run because preventative care is more likely to be offered in longer consultations. Clinical care for some chronic care is better in practices with longer booked intervals between one appointment and the next.²⁵Physical inactivity and smoking are modifiable risk factors for CVD.^{26,27} High alcohol consumption and a sedentary lifestyle contribute to the risk of hypertension in the elderly and thus mortality from its associated disease outcomes.²⁸Accordingly, minimizing these risk factors is a beneficial approach to reducing BP non-pharmacologically and CVD events.²⁹

Both clinics had poor chronic care processes and this again shows that the district health system needs to intensify programmes in management of hypertension and possibly other chronic disease. Unfortunately much attention was given to HIV/ AIDS and other disease received less attention for a long time. In many countries there were policy barriers to the implementation of blood pressure-lowering treatment programs. Most common was the restrictive focus of prevention programs on infectious disease and sometimes on HIV/AIDS alone. Many lower-income countries face a double burden of communicable and non communicable disease, yet few allocate resources to demands on the basis of cost-effectiveness or even disease burden. Multilateral organizations, such as the World Health Organization and the World Bank, have been partly responsible for this unbalanced approach through the setting of Millennium Development Goals that excluded any mention of chronic disease prevention and through the setting of implausibly high targets for antiretroviral therapy implementation.³⁰

LIMITATION OF STUDY

This study has all the limitations of a cross sectional record review e.g. the quality of counseling could not be assessed, the reasons for poor control of BP could not be determined. I could not determine from the data the extent to which the shortfalls noted were related to gaps in provider knowledge, incomplete documentation, or high clinic volume. Most fast lane clinic were treated at the hospital by doctors before and their BPs were well controlled before down referral to fast lane clinic, whereas most patients at standard clinic had their treatment initiated at the clinic by nurses.

CONCLUSION

Fast lane clinic has better outcomes when compared with standard clinic because of better controlled BP, random total cholesterol and serum creatinine. The average visits of patients at fast lane clinic are lower than that of a standard clinic despite speedy service and shorter queues. Given the lower cost for operating fast lane clinic compared to a standard clinic there may be value in maintaining and expanding fast lane clinic approach in Ditsobotla provided that is acceptable to local patients and also intensifying hypertension programmes in the district.

IMPLICATIONS FOR CLINICAL PRACTICE & TREATMENT GUIDELINE

It is evident that management of hypertension is suboptimal in recording of random total cholesterol; creatinine; proteinuria and BMI and outcomes on target and this has been found in other studies.⁵ There is a need to retrain health care workers managing hypertensive patients and possibly conduct post intervention study, and encourage the chronic care coordinator to have monitoring and evaluation system of the quality of care because the professional nurses have been trained in the new hypertension guidelines. Managers and policy makers should ensure procurement of necessary equipment to render quality hypertension care services as only Essential Drug List for Primary Health Care book was found in all the consultation rooms.

There is a need to improve quality of care in both clinics, and this implies correcting management of hypertensive patients at the district level as well as at the institutional level e.g. ensuring adequate equipment; reinforcing chronic care processes; introducing chronic disease records and encouraging clinical audits at the institutional level. This may include strengthening chronic care model. The Chronic Care Model (CCM) is designed to help practices improve patient health outcomes by changing the routine delivery of ambulatory care through six interrelated system changes meant to make patient-centered, evidence-based care easier to accomplish. The aim of the CCM is to transform the daily care for patients with chronic illnesses from acute and reactive to proactive, planned, and population-based. It is designed to accomplish these goals through a combination of effective team care and planned interactions; self-management support bolstered by more effective use of community resources; integrated decision support; and patient registries and other supportive information technology (IT). These elements are designed to work together to strengthen the provider patient relationship and improve health outcomes. Evidence suggests that practices redesigned in accord with the CCM generally improve the quality of care and the outcomes for patients with various chronic illnesses.³¹

During the Non-Communicable Disease Summit in South Africa in 2011 a presentation was made on integrated chronic care management as a way of strengthening health systems. It has six building blocks namely: service delivery; health workforce; information; medical products, vaccines and technologies; financing and leadership/governance. The outcomes of this model are improved health (level and equity); responsiveness; social and financial risk protection as well as improved efficiency.³² Some people in South Africa like Asmalland Mahomed have seen a need to adopt a model of integrated disease management to improve health outcomes.³²

IMPLICATIONS FOR FUTURE RESEARCH

There is a need to conduct further prospective studies in this area interviewing healthcare workers and managers on the management of hypertension. This emanates from the limitations of the study that I have stated before.

References

1. Seedat Y K, Croasdale M A, Milne F J, Opie L H , Pinkney- Atkinson V J, B L Rayner, Veriava Y. South African Hypertension Guideline 2006. *S Afr Med J* 2006;96:337-362.
2. South African Department of Health. Standard Treatment Guidelines and Essential Medicine List. Pretoria: Government Printers 2008.
3. World Health Organisation. Global status report on non communicable diseases 2010: Description of global burden of non communicable diseases, their risk factors and determinants. Italy: Government Printers 2011.
4. South African Department of Health. Hypertension: National programme for control and management at primary level. Pretoria: Government Printers 1998.
5. Steyn K, Levitt NS, Patel M, Fourie J, Gwebushe N, Lombard C, Everett K. Hypertension and diabetes: Poor care for patients at community health centres. *S Afr Med J* 2008;98:618-622.
6. Naik AD, Kallen MA, Walder A, Street FL. Improving hypertension control in Diabetes Mellitus. *Circulation* 2008;117:1361-1368.
7. Denver EA, Barnard M, Woolfrion RG, Earle KA. Management of uncontrolled hypertension in nurse led care compared with conventional care for patients with type 2 diabetes mellitus. *Diabetes Care* 2003;26:2256-2260.
8. Fahey T, Schroeder K, Ebrahim S. Educational and organisational interventions used to improve the management of hypertension in primary care: a systematic review. *Br J Gen Pract* 2005; 55: 875-882.
9. South African Department of Health. PHC package for South Africa: a set of norms and standards. Pretoria: Government Printers 2000.
10. Phillips L, Branch W, Cook C et al. Clinical inertia. *Annals of Internal Medicine*. 2001;135:825-834.

11. Al-Homray MA, Khan MY, Al-Khaldi YM, Al-Gelban KS, Al-Amri HS. Hypertension care at Primary Health Care Centres: A report from Abha, Saudi Arabia. *Saudi Journal of Kidney Diseases and Transplantation* 2008;19(6):990-996.
12. Gaziano TA, Steyn K, Cohen DJ, Wenstein MC, Opie LH. Cost effectiveness analysis of hypertension guidelines in South Africa: absolute risk versus blood pressure level. *Circulation* 2005;112:3569-3576.
13. Western Cape Department of Health. Integrated Audit for Chronic Disease Management: Instruction Manual, Audit and Summary Tools. 2010.
14. Spranger CB, Ries AJ, Berge CA, Radford NB, Victor RG. Identifying gaps between guidelines and clinical practice in the evaluation and treatment of patients with hypertension. *The American Journal of Medicine* 2004;117(1):62-4.
15. DiTusa L, Lazier AB, Jarosz DE, Snyder BD, Izzo JL. Treatment of hypertension in a managed care setting. *Am J Manag Care* 2001;7:520-4.
16. Goldstein AO, Carey TS, Levis D, Madson S, Bernstein J. Variations in hypertension control in indigent rural primary care clinics in North Carolina. *Arch Fam Med* 1994;3:514-9.
17. Jackson JH, Bramley TJ, Chiang TH, Jhaveri V, Frech F. Determinants of uncontrolled hypertension in an African-American population. *Ethn Dis* 2002;12:53-7.
18. Pavlik VN, Hyman DJ, Vallbona C. Hypertension control in multi-ethnic primary care clinics. *J Hum Hypertens* 1996;10(3):19-23.
19. Godley P, Nguyen A, Yokoyama K, Rohack J, Woodward B, Chiang T. Improving hypertension care in a large group-model MCO. *Am J Health Syst Pharm* 2003;60:554-64.
20. Meissner I, Whisnant JP, Sheps SG, et al. Detection and control of high blood pressure in the community do we need a wakeup call? *Hypertension* 1999;34:466-71.
21. Fagard RH, Van den Enden M, Leeman M, Warling X. Survey on treatment of hypertension and implementation of World Health Organization/International Society of Hypertension risk stratification in primary care in Belgium. *Journal of Hypertension* 2002;20:1297-1302.
22. Deventer C, Couper I, Sondzaba N. Chronic patient care at North West Province Clinics. *Afr J Prm Health Care & Fam Med* 2009;1(1):1-5.
23. Macharia WM, Leon G, Rowe BH, Stephenson BJ, Haynes RB. An Overview of Interventions to Improve Compliance With Appointment Keeping for Medical Services: *JAMA*. 1992;267(13):1813-1817.
24. Lacy NL, Paulman A, Reuter MD, Lovejoy B. Why We Don't Come: Patient Perceptions on No-Shows. *Annals of Family Medicine* 2004;2:541-545.
25. Kaplan SH, Greenfield S, Ware JE. Assessing the physician-patient interactions on the outcome of chronic disease. *Med Care* 1989;27:110-125.
26. Franco OH, De Laet C, Peeters A et al. Effects of physical activity on life expectancy with cardiovascular disease. *Arch Intern Med* 2005;165:2355-60.
27. Doll R, Peto R, Boreham J et al. Mortality in relation to smoking: 50 years' observations on male British doctors. *BMJ* 2004;328:1519-28.
28. Malinski MK, Sesso HD, Lopez-Jimenez F et al. Alcohol consumption and cardiovascular disease mortality in hypertensive men. *Arch Intern Med* 2004;164:623.
29. Published by Oxford University Press on behalf of the British Geriatrics Society. *Age and Ageing* 2010;39:112-139.

30. Perkovic V, Huxley R, Wu Y, Prabhakaran D, Macmahon S. Burden of Blood Pressure related disease: A neglected priority for global health. *Hypertension* 2007;50:991-997.
31. Coleman K, Austin BT, Brach C, Wagner EH. Evidence On The Chronic Care Model In The New Millennium: National Blood Pressure study cohort *Health Affairs* 2009;28(1):75-85.
32. Asmall S, Mahomed OH. Controlling NCD through Health System Strengthening. Concept Paper for discussion at NCD summit 2011.`