Quality Improvement Cycle for Cardiac Failure in Primary Health Care: Elsies River Community Health Centre, Cape Town

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Principal Investigator: Dr NS Cornoc, Registrar in Family Medicine, Eastern Metropole Training Complex, Stellenbosch University

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Supervisor: Prof B. Mash, Head of Division of Family Medicine and 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: …………….…..........…"

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Signature:

....   Date: 17-01-2012

Print Name: ..,..Noémi Cornoc...

Abstract

Introduction

The study aimed to assess and improve the quality of care for congestive cardiac failure in a public sector, primary health care setting, in Cape Town. There is currently no literature available on the quality of care for the management of congestive cardiac failure in primary health care in South Africa.

Methods

A disease register was constructed by identifying patients prescribed Furosemide and checking the medical records. Altogether 95 patients with CCF were identified. The study followed the usual steps for a quality improvement cycle: Formation of an audit team; agreeing on criteria based on current CCF guidelines; collection of data from medical records to measure the criteria; analysis and feedback of results to the staff; critical reflection, planning and implementing change; re-audit of the medical records.

Results

There was a mean age of 63.4 years, 21% were male and 75% were females. The results of the initial audit revealed suboptimal management of patients diagnosed with CCF: 53% had an aetiological diagnosis recorded in the clinical notes, 24% had a documented functional capacity, 12% of patients had documented precipitating/exacerbating factors, 58% had fluid status documented, and 37% had documentation of their cardiac rate and rhythm.

The intervention consisted of feedback on the audit results and critical reflection with the relevant staff members. The doctors were provided with a printed protocol to refer to for the management of CCF. Clinicians were resistant to change and to taking on new tasks in relation to the management of patients with CCF and decided to only focus on improving the clinical assessment of patients.

The results of the re-audit after 5-months in 40 patients demonstrated improvement in the clinical assessment criteria: 95% of the patients had an aetiological diagnosis recorded in the notes, 50% had a documented functional capacity, 42% had documented precipitating/exacerbating factors documented, 72% had their fluid status documented, and 85% of patients had their cardiac rate and rhythm documented.

None of the five assessment criteria were met at baseline but post-intervention three of the five met the target set and all showed substantial improvement. There was no improvement noted in any of the other criteria, which were not specifically focused on in the plan to improve clinical practice.

Conclusion

The current quality of care for CCF in primary health care is poor and needs to be improved. The quality improvement cycle led to substantial improvement in the clinical assessment of

patients with CCF. Recommendations are made regarding future criteria, which could be included in local audit tools.

1. Study Title

Quality Improvement Cycle for Cardiac Failure in Primary Health Care: Elsies River Community Health Centre, Cape Town

2. Introduction

Congestive cardiac failure (CCF) is a symptom of severe heart disease, which is often progressive and has a poor prognosis if left untreated.[1] CCF may result from any structural or functional cardiac disorder that impairs the ability of the heart to support physiological circulation.[2]

Mortality statistics in South Africa reveal that, between 1997 and 2004, 195 people died per day from some form of cardiovascular disease and 37 of these were from CCF.[3] Cardiovascular diseases in Sub-Saharan Africa account for 7-10% of all medical admissions to hospital, with heart failure contributing 3-7%.[4,5] Despite this it is acknowledged that "sources of data on cardiovascular disease rates in Sub-Saharan Africa are generally lacking and when present are often of poor quality".[6]

Only 24% of men and 31% of women survive for five years after presentation with heart failure and it is thus a diagnosis with a poor prognosis. This will be compounded by poor quality of care.[7]

Congestive cardiac failure is a syndrome, not a diagnosis, thus the underlying cause should also be identified and treated whenever possible. In developed countries 80% of CCF is caused by coronary heart disease or hypertension.[1] Aetiology of CCF in Sub-Saharan Africa is different and includes: rheumatic heart disease (32%), dilated cardiomyopathy (25%), hypertensive heart disease (17%), and ischaemic heart disease (2%).[8] A study conducted in 2006 at the Chris Hani Baragwaneth Hospital detailed demographic data from 844 patients that were diagnosed with heart failure.[9] The most common aetiologies identified by this study were hypertension (33%), idiopathic dilated cardiomyopathy (28%) and right heart failure (27%), it was also stated that black Africans had less ischaemic cardiomyopathy, but had increased causes of cardiomyopathy secondary to other causes.[9] Cardiac pathology due to HIV, such as dilated cardiomyopathy and tuberculous pericarditis, is also an important cause of CCF in most African countries. HIV-associated cardiomyopathy has a poor prognosis, with progression to death within 100 days of diagnosis in patients who are not treated with antiretroviral drugs.[8]

The diagnosis of CCF in primary care relies mostly on clinical skills, with limited access to special investigations and opportunities for referral. In the South African primary care context we have access to electrocardiograms (ECG) and chest radiographs; echocardiography is only available through specialist referral. This is problematic because it often leaves the diagnosis of CCF incomplete and without objective evidence of structural abnormalities.[10]

The diagnosis of CCF has many implications, especially since systolic heart failure (the form most common in Africa) is amenable to treatment.[8] The African American Heart Failure Trial study established that a good quality of care for CCF can lead to a significant improvement in all major outcomes including mortality, readmission to hospital, and quality of life. [8]

The American Heart Association has proposed criteria to assess the quality of care for patients with CCF and these are summarized below: [11]

- Left Ventricular Ejection Fraction (LVEF) recorded or qualitative description of left ventricular function

- Angiotensin Converting Enzyme Inhibitor (ACE-I) prescribed if LVEF <0.40 or a documented reason for not receiving it (in this case an Angiotensin Receptor Blockers or Isosorbide Dinitrate are acceptable alternatives)

- ACE-I prescribed at >50% of target dose (or had ACE-I dose increased from baseline)

- Digoxin prescribed if LVEF < 0.40

- Warfarin prescribed for patients with atrial fibrillation and no contraindications

- Patient education, including medications, low-salt diet, signs and symptoms of worsening CCF, weight monitoring, smoking cessation

- Beta-blocker prescribed if LVEF < 0.35

- Spironolactone prescribed if LVEF < 0.35

- Patients with a history of past myocardial infarction or current angina should be evaluated for ischaemic heart disease

- Blood pressure control if LVEF < 0.40: Systolic blood pressure (SBP) <120mmHg and diastolic blood pressure (DBP) <80mmHg; LVEF >0.40: SBP<140mmHg & DBP< 90mmHg

- Exercise training

The criteria listed above, as well as criteria from the Evidence-Based Medicine Guidelines on Chronic Heart Failure and NICE guidelines on Chronic Heart Failure [1,2,11] are more applicable to developed country resources and settings, for the assessment of the quality of care for heart failure patients. Bearing in mind the context of primary health care in South Africa, with limited resources and budget constraints, the criteria should be modified so that they may be practically included in management of CCF. The following criteria may be more appropriate in the public primary care sector of South Africa[12]:

Clinical Assessment

History

- identify precipitating and/or exacerbating factors

- record functional capacity at baseline and at every visit

- identify underlying aetiology

Examination

- record fluid status (body weight monitoring, as well as clinical examination)

- record cardiac rhythm

Investigations

- 12-lead ECG within past 12 months

- Chest radiograph at least once from time of diagnosis

- Haemoglobinometer reading at every visit

- Yearly creatinine

- Urinalysis at every visit

Management

- Lifestyle modification advice documented (encourage to adopt regular exercise, abstain from smoking and avoid harmful alcohol use)

- Offered annual vaccination against influenza

- Blood pressure control: SBP<140 mmHg, and DBP<90mmHg

- Pharmacological therapy:

    o Start ACE-I and titrate upwards (if not tolerated consider angiotensin II receptor antagonist)

    o Add beta-blocker and titrate upwards (may be indicated for asymptomatic patients, in order to improve prognosis)[1]

    o Add spironolactone (used in severe CCF, New York Heart Association Grade 3 or 4, early introduction improves prognosis) [1]

    o Add diuretic therapy at any point to control congestive symptoms and fluid retention

    o Add digoxin if the patient is in atrial fibrillation or if patient in sinus rhythm and remains symptomatic despite ACE inhibitor, beta-blocker and spironolactone.

According to the Standard Treatment Guidelines and Essential Drug List for South Africa treatment should encompass a holistic approach, including patient education, lifestyle modification, as well as appropriate contraceptives for females with CCF diagnosis.[13]   The drug treatment guideline indicates that mortality is significantly reduced by the utilization of ACE-I, beta-blockers and spironolactone.[13] This guideline also recommends referral to the next level of care " where specialized treatment and diagnostic workup is needed and to identify treatable and reversible causes".[13]

A continuum of care should be made available to all patients with CCF from clinic to palliative and hospice care. Close follow-up of patients with CCF results in improved functional capacity, adherence to medication, healthier diet, better patient satisfaction, and reduced hospital admissions.[14] Health care professionals should set goals with individual patients, and if these goals are consistently unmet, then additional resources must be used. Resources might include a dietician to clarify appropriate food choices, referral to another specialist, a disease management program, social workers to help with monetary or family issues, or even extra physician time for education and discussion with the patient. None of these resources will be offered if the physician does not recognize the need. [7, 15]

The patient's own perspective (e.g. expectations, concerns, preferences, beliefs) should always be taken into consideration with whatever management is decided upon. The integration of palliative care early in the management of CCF might be appropriate when taking the poor prognosis of the syndrome into account, as prognosis of CCF is often underestimated by health care professionals. [16]

The purpose of this study was to develop an audit tool, and improve the current quality of care offered to patients at Elsies River Community Health Centre. The evaluation of interventions and proposed solutions are deemed to be legitimate motivation for scientific research. [17]

"The rationale for measuring quality improvement is the belief that good performance reflects good-quality practice, and that comparing performance among providers and organizations will encourage better performance." [19]

There is no available data about the quality of care for CCF in primary care, in South Africa. An observational study conducted in the south-eastern part of Netherlands evaluated the quality of care provided in primary health care to CCF patients. The researchers implemented a programme for improvement, which proved to have moderate impact on patient care.[20] The strategy used by the investigators in the Netherlands to improve the quality of care included an educational component, as well as an organizational component. "The educational component included a written summary of the non-pharmaceutical and pharmaceutical treatment recommendations. The information on non-pharmaceutical treatment concerned physical exercise, diet, smoking cessation, influenza vaccination, and materials to support advice to patients. The information on pharmaceutical treatment concerned the different drug groups advised: diuretics, ACE inhibitors or ARBs, beta blocking agents, aldosterone blocking agent, and digoxin. Practices were encouraged to come to agreement about collaboration with other care providers and on the delegation of clinical

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tasks to nurses within the practice."[20] Globally, studies undertaken in developed countries have concluded that the quality of care for CCF patients in primary health care is suboptimal [21,22,23,24,25,26].

3. Aims and Objectives of the study

Aim:

To assess and improve the quality of care for CCF at Elsies River Community Health Centre, Cape Town

Objectives:

1. To assess the current quality of care for CCF

2. To plan and implement changes to improve the quality of care for CCF

3. To assess if these changes are associated with a measurable improvement in the quality of care

4. Methods

Study Design

The Quality Improvement Cycle (QIC) is a well-known method for assessing and improving the quality of care. The study design will follow the usual steps of the QIC:

- Form a team to perform the QIC that includes the key people involved in the topic at the local level

- Set target standards made up of evidence-based criteria and locally relevant performance levels

- Collect data to measure these target standards and compare actual performance to desired performance

- Plan and make changes to improve the quality of care

- Re-assess performance to determine if the QOC has improved

Setting

Elsies River Community Health Centre (CHC) is run by a facility manager, one family physician, with medical officers, community service doctors, clinical nurse practitioners, as well as an array of nursing staff. Clinical nurse practitioners provide services in accordance with the national package of care which includes child and adult curative, preventative and promotive services, communicable diseases, as well as chronic disease management.[27]

According to the South African primary health care package of care priority chronic diseases include cardiovascular diseases such as hypertension and stroke, thus the training of clinical nurse practitioners will focus on those areas, and other cardiovascular diseases including CCF is currently deemed out of their scope of practice.[28] The Standard Treatment Guidelines and Essential Drug List for South Africa at hospital level are aimed for use at district and regional hospitals.[13] The CHC has a functional 24-hour casualty unit, 3-4 oxygen tanks are available, with one ECG machine in the facility, there is also a radiographer (who operates one X-ray machine) available during working hours.

There is no protocol currently available for health care providers at Elsies River CHC with regards to CCF, which is tailored specifically for primary health care clinics, or community health care centres, adapted to a South African context. There is a physiotherapist, as well as an occupational therapist available on site; however they have no involvement with the current management of CCF. Medications currently available for treatment of CCF include ACE-I (Enalapril), beta-blockers (Atenolol), diuretics (Furosemide), Spironolactone and Digoxin.

Quality improvement steps

1. Create an Audit Team

The clinical audit team at Elsies River CHC consisted of the researcher and family physician in charge as well as representatives from the pharmacy and reception.

2. Create a disease register

The researcher created a disease register for patients with CCF by identifying potential patients from the prescription of oral or intravenous Furosemide. The researcher provided a logbook in which the pharmacists kept a record of all these patients. It was presumed that most patients diagnosed with CCF would be prescribed Furosemide. The diagnosis was then confirmed by examination of the medical record. All patients with CCF who were being managed at Elsies River CHC were included in the study, and due to the number identified there was no need for sampling. Altogether 381 patients on Furosemide were identified, 117 folders could not be located and 169 did not have a diagnosis of CCF. This left 98 patients with CCF, 3 of whom were not being managed at Elsies River CHC. The final number of patients included in the study was therefore 95. For the management options 9 patients were identified as being ACE inhibitor intolerant and thus were excluded from this criterion.

3. Formulating target standards

Target standards were set based on the recommended criteria (Table 1), as discussed in the introduction, but input from the audit team was also of paramount importance. Initially only the criteria were agreed to and performance levels were only defined after the baseline audit.

Table 1: Criteria for assessing quality of care

Structural	Process	Outcome
Present on the day of the audit: Functional ECG machine Functional X-ray machine Functional haemoglobinmeter Urinalysis testing strips Medication in stock (Enalapril, Atenolol, Spironolactone, Furosemide, Digoxin) Influenza vaccine available (in season)	% of patients with an aetiological diagnosis recorded in the notes % of patients with a recording at every visit of: • Functional capacity • Precipitating/ exacerbating factors • Fluid status • Cardiac rate and rhythmn % of patients with the following investigations: • 12-lead ECG within past 12 months • Chest X-ray at least once from time of diagnosis with CCF • Haemoglobinometer reading at every visit • Creatinine in past 12 months • Urinalysis at every visit	% of all visits for CCF that are for exacerbations or emergencies during the last year % of patients hospitalised in the last year % of patients showing a functional improvement over the last year % of patients with SBP<140mmHg, and/or DBP<90mmHg

	% of patients with the following management options recorded: • Enquiry/Advice on exercise in last year • Enquiry/Advice on alcohol use in last year • Enquiry/Advice on tobacco smoking in last year • Enquiry/Advice on diet in last year • Offered annual vaccination against influenza in last year • Prescribed ACEI • Prescribed beta blocker • Prescribed spironolactone if indicated • Prescribed diuretic • Prescribed digoxin if indicated	

4. *Data collection*

Data collection was performed by the researcher using a standardised data collection form for each patient folder examined. Data was recorded from the folders to measure the process and outcome criteria. The patients were seen by both clinical nurse practitioners and doctors employed at Elsies River Community Health Centre,

5. *Analyzing the data and comparing results to target standards*

A consultant from the Centre for Statistical Consultation, University of Stellenbosch assisted with data analysis. Data from the audit was analyzed using simple frequencies / percentages.

6. *Planning Change*

The results of the analysis were presented to the audit team, as well as all health care providers from the Elsies River CHC, and a discussion with these key role-players was conducted as to what changes could realistically be implemented.

7. *Implementation of change*

Once the team was briefed and a plan of action was collectively decided, a period of approximately five months was given for the changes to be implemented.

8. *Reflecting on results*

Steps 4-6 were repeated, at the end of five months, and the data obtained at that point was a reflection of current practice after the initial intervention. Analysis looked for any significant changes in the criteria. Results were then discussed with the health care providers and further changes planned (although not implemented as part of this study). A list of recommendations was compiled, including practical steps to address areas of concern.

Ethics

Ethics approval was obtained from the Health Research Ethics Committee of the University of Stellenbosch (Reference number: N10/05/175). Permission was obtained from the Department of Health, facility manager, as well as the family physician in charge of Elsies River Community Health Centre. A waiver of informed consent was obtained to allow collection of data retrospectively from medical records.

5. Results

The structural criteria were assessed by the researcher walking through the facility and observing the items listed on the 5 days of data collection

A total of 95 patients were identified with CCF, the mean age was 63.4 years and there were 20 (21%) males and 75 (79%) females. Table 2 shows data from the baseline audit.

Table 2: Results of baseline audit January 2011 (N=95).

Process	n	%
% of patients with an aetiological diagnosis recorded in the notes	50	53
% of patients with a recording at every visit of:		
• Functional capacity	23	24
• Precipitating/ exacerbating factors	11	12

• Fluid status	55	58
• Cardiac rate and rhythm	35	37
% of patients with the following investigations:		
• 12-lead ECG within past 12 months	43	45
• Chest X-ray at least once from time of diagnosis with CCF	60	63
• Haemoglobinometer reading at every visit	19	20
• Creatinine in past 12 months	33	35
• Urinalysis at every visit	12	13
% of patients with the following management options recorded:		
• Enquiry/Advice on exercise in last year	8	8
• Enquiry/Advice on alcohol use in last year	3	3
• Enquiry/Advice on tobacco smoking in last year	19	20
• Enquiry/Advice on diet in last year	5	5
• Offered annual vaccination against influenza in last year	2	2
• Prescribed ACEI	66	70
• Prescribed beta blocker	29	31
• Prescribed spironolactone if indicated	14	15
• Prescribed diuretic	95	100
• Prescribed digoxin if indicated	5	5
Outcome		

% of all visits for CCF that are for exacerbations or emergencies during the last year	38	40
% of patients hospitalised in the last year	16	17
% of patients showing a functional improvement over the last year	1	1
% of patients with SBP<140mmHg, and/or DBP<90mmHg	49	52

Plan and implement changes to improve the quality of care for CCF

The initial audit findings were presented to the health care providers at Elsies River CHC, who were involved in the management of patients with CCF.   This occurred on two occasions.

At the first meeting the researcher was met with some resistance from the staff members. The family physician was present, as well as one of the medical officers, and there were also numerous clinical nurse practitioners. Several concerns were highlighted, regarding the implementation of the suggested protocol for CCF management.

- Time constraints: the individual health care providers have to see a large number of patients daily, thus they cannot spend more than 10 minutes with a patient.

- Dwindling staff members: vacant posts are not being filled, or the posts are being frozen, thus resulting in increasing pressure on the existing staff. The trend was observed by the family physician and applied to both nursing staff and doctors.

- Increasing patient population: despite a shortage of staff members the patient population is increasing.

- Patient adherence to treatment: often a problem despite a perception that patient health care education was adequate

At the second meeting the attending staff members agreed to focus on one area of the protocol to improve upon. The staff that was present consisted of the family physician, a family medicine registrar, two medical officers, and numerous clinical nurse practitioners. The clinical assessment of patients was the chosen area for improvement, as it was decided that the special investigations were too time consuming and thus they were not included in the plans for changing practice. The changes agreed to were improving the history taking and clinical examination of CCF patients. Performance levels for the process criteria related to clinical assessment were decided upon by the health care professionals and are shown in Table 3. Performance levels were not agreed to for the other criteria.

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Implementation of this was over a five month period and responsibility was taken on by the doctors working at Elsies River CHC, they were given a printed proposed guideline for CCF to refer to.

To assess if these changes are associated with a measurable improvement in the quality of care

The post-intervention medical audit included all the patients from the baseline audit that consulted between 01 June 2011 and 11 August 2011. The total number of folders that were reviewed was 85, as there were 10 folders that could not be located, and the 45 patients that consulted prior to 01 June 2011 were excluded. The remaining 40 patients were thus re-audited. The mean age was 63.4 years and there were 9 males (22.5%) and 31 females (77.4%).

Table 3 shows the results of the re-audit and demonstrates improvement in the clinical assessment criteria. None of the five criteria were met at baseline but post-intervention three of the five met the target set and all showed substantial improvement. There was no improvement noted in any of the other criteria which were not specifically focused on in the plan to improve clinical practice.

Table 3: Results of post-intervention audit (N=40)

Process	Target Standard	Baseline	n	%
% of patients with an aetiological diagnosis recorded in the notes	80%	54%	38	95%
% of patients with a recording at every visit of:				
• Functional capacity	80%	25%	20	50%
• Precipitating/ exacerbating factors	50%	12%	17	42%
• Fluid status	70%	60%	29	72%
• Cardiac rate and rhythm	70%	38%	34	85%
% of patients with the following investigations:				
• 12-lead ECG within past 12 months		48%	12	30%
• Chest X-ray at least once from time of diagnosis with CCF		66%	25	63%
• Haemoglobinometer reading at every visit		20%	1	2.5%

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• Creatinine in past 12 months	38%	8	20%
• Urinalysis at every visit	14%	0	0%
% of patients with the following management options recorded:			
• Enquiry/Advice on exercise in last year	8%	0	0%
• Enquiry/Advice on alcohol use in last year	3%	0	0%
• Enquiry/Advice on tobacco smoking in last year	21%	2	5%
• Enquiry/Advice on diet in last year	5%	1	2.5%
• Offered annual vaccination against influenza in last year	1%	0	0%
• Prescribed ACEI	70%	30	75%
• Prescribed beta blocker	34%	10	25%
• Prescribed spironolactone if indicated	16%	3	7.5%
• Prescribed diuretic	100%	40	100%
• Prescribed digoxin if indicated		2	5%
Outcome			
% of all visits for CCF that are for exacerbations or emergencies during the last 5 months	39%	8	20%
% of patients hospitalised in the last 5 months	17%	3	7.5%
% of patients showing a functional improvement over the last 5 months	1%	0	0%
% of patients with SBP<140mmHg, and/or DBP<90mmHg	58%	24	60%

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6. Discussion

Key findings of the study

The current quality of care for CCF in primary health care is poor and needs to be improved. The clinical assessment of patients was found to be incomplete, the history taking and examination of patients was particularly poor. The special investigations had areas which were adequate, such as radiological investigations, but the side-room tests for anaemia and renal function were less frequent than the target standard. The components of lifestyle modification advice were poorly documented. The pharmacological management was adequate with sufficient numbers of patients being prescribed diuretics as well as ACE-inhibitors.

As a result of the quality improvement cycle there was definite improvement in the clinical assessment of patients, even though all the target standards were not met. Changes were made after engaging the doctors in a process of critical reflection on the audit results and providing them with written feedback. The process of a quality improvement cycle will ultimately result in improved patient outcomes, by way of ensuring adequate and early detection of complications, patient deterioration and appropriate management strategies. This may result in decreased burden of disease as a result of decreased hospitalizations, as well as decreased presentations to emergency departments.

The commitment of doctors to improve care was limited due to a perception that there was inadequate staff to handle an increasing workload and that the consultation time was very restricted for comprehensive care. There was also a belief that health education was adequate and a tendency to blame patients for not complying with their treatment. The Heart of Soweto study quoted 71% adherence to prescribed heart failure medication, with patient treatment knowledge being poor (56%). [29] This could be characterized as a kind of survival mentality amongst the staff with a perception that more and more is being asked of them without providing sufficient resources and support. In this context the emphasis appeared to be on protecting themselves from further unrealistic expectations rather than fully aligning themselves with improving the quality of care.

The phenomena of clinical inertia may have also contributed to the feedback received. Clinical inertia consists of three doctor factors, which result in the failure of a clinician to initiate or intensify treatment[30]

- Clinicians overestimate the care they provide: doctors might attribute persistent symptoms or deterioration of patients' clinical presentation to other factors such as non-adherence, as opposed to recognizing sub-optimal pharmacotherapy.

- Clinicians use "soft" reasons to avoid therapy: an example would be avoiding increasing anti-hypertensive therapy based on a single reading, attributing the high blood pressure reading to the anxiety associated with attending clinic.

- Lack of education, training or organization to achieve therapeutic goals: this statement is self-explanatory, in that doctors may be unfamiliar with the most recent treatment guidelines.

However resistance to change may also have been increased by the researcher as she may have been perceived as an outsider who was criticizing the staff and telling them what they should do. The second meeting was more successful in eliciting solutions that were acceptable to the doctors.

In terms of revising the audit tool for future use I would recommend the inclusion of the criteria for clinical assessment. The criteria for the haemoglobinometer reading and urinalysis should be revised to an annual reading, rather than at every visit. The criteria on different aspects of lifestyle modification may be better as one combined criterion, instead of listing each aspect separately. Doctors may have recourse to their own clinical judgment as to what intervention is appropriate at the time of consultation, as an example; in a patient whom has never smoked it is inappropriate to advise him/her annually to stop smoking. The inclusion of lifestyle modification criteria as separate entities might result in seemingly substandard audit results in that field of assessment. The medical records were not sufficient to determine whether spironolactone, digoxin and beta blockers were actually indicated and therefore these criteria should be deleted at present. The outcomes should remain unchanged.

Comparison to the literature

Evidence-based guidelines are often under-used in clinical practice.[22] The current guidelines for the management of CCF are not ideally tailored to primary health care in South Africa, are relatively complex, and not "user-friendly". The doctors were presented with the proposed guideline after the initial audit. The guideline the researcher disseminated was intended to be a simplified version of existing guidelines tailored for the primary health care setting in South Africa.   The initial audit may have yielded poor results due to the doctors not utilizing guidelines that were not yet adapted to the applicable setting, as well as the document being quite complex and protracted. Strategies to improve the use of guidelines include modification of guidelines to support various types of decisions by different users. New governance structures may be required to adapt to the development of guidelines with these features.[22]

There is no local published data regarding the quality of care for cardiac failure in primary care. A study conducted at a tertiary institution in South Africa acknowledged the unique aspects of heart failure in the African setting and the need for culturally sensitive interventions.[9]

A study regarding the implementation of heart failure guidelines in primary care (conducted in a similar middle income country, Brazil) concluded that: "There is a significant divergence between primary practice and the guidelines. In this setting, the limited availability of echo and of the recommended drugs, combined with a lack of information, restricts their use. A program to improve adherence to the guidelines and to an evidence-based approach,

through continuous medical training, should be implemented to improve the quality of primary care." [31] Similar conclusions could be reached in this study, although the essential drugs were mostly available and doctors' knowledge about the management of CCF was not assessed.

An observational study conducted in the Netherlands found that a pilot improvement program did have a moderate impact on patient care.[20] The program educated both doctors and patients on CCF and aimed at improving medical treatment as well as collaboration with allied health care professions. The measurement of the impact only included records which were fully completed, thus reducing the underreporting of actual clinical practice through incomplete records that was an issue in the audit at Elsies River.

A study in Israel concluded that telemedicine reduced a considerable amount of potential referrals to the emergency department, thus resulting in decreased health care cost. The telemedicine involved the patient's vital signs and weight being transmitted daily to the system's monitor centre, and the monitor center's nurse telephoned the patient twice monthly to assess a number of parameters, including well-being, frequency of specific symptoms, adherence to treatment, and to remind him/her of the importance of maintaining a salt-free diet and adherence to treatment regimen.[32] Studies in high income countries have used interventions successfully such as telemedicine which are not yet feasible in our context. Telemedicine is focused on improving patient adherence to treatment and appropriate follow-up.

Disease management programs have been shown to be an effective approach to care for the high risk patients with complex care needs, there is also evidence supporting nurse-led management programs for high risk elderly patient, which has resulted in improved outcomes for health care.[33,35] The implementation of a disease management program which may be nurse-led may improve the quality of care provided to CCF patient's in primary care, this may prove to be effective if the patient's are stable and may also result in more comprehensive care delivery by decreasing the work-load on doctors. This may be especially beneficial in settings where there are insufficient doctors. Care must be taken to maintain a patient centered approach when utilizing disease management programs, in an effort to avoid eroding care of the whole person and co-morbidity.

Limitations and strengths

Limitations of the study were the small number of patients in the study, especially in the second, post-intervention audit. At baseline eligible patients may have been missed due to patient records being lost or misplaced. Sometimes the same patient had more than one record. In the follow up audit the reduced time period for data collection restricted the number of eligible patients.

Although Elsies River is fairly typical of health centres in the Cape Town metropole there is variation in staffing levels, organization of care and competency of staff between health centres. The quality of care, therefore, may not be exactly generalisable to all other health

centres. However the quality of care is unlikely to differ dramatically and one can anticipate that the quality of care will be poor at most other health centres.

A strength of the study is that there was no inter-observer bias when the patient folders were audited, as the researcher was the only one that audited the clinical records.

Recommendation and implications

Continuing professional development programmes in primary health care should focus on the management of CCF and attempt to improve the competency of health providers in this area. A separate study could be performed with health care providers to assess the adequacy of their knowledge and decision making pertaining to CCF management in primary care, this was however not a part of this quality improvement cycle.

The resistance of medical officers to change and improve professional practice appeared related to job stress caused by staff shortages, patient numbers and time pressures. A recent study in Cape Town revealed that 76% of doctors are suffering from significant symptoms of burnout and 27% from moderate depression.[36] Long hours, high workload and frustrations with the organization were the key factors linked to burnout. Improvements in future quality therefore may require attention to the organizational context in which medical officers and other staff are working. A supportive working environment can enable better performance. The working environment should incorporate sufficient equipment, supplies, infrastucture, as well as system issues (decision- making and information-exchange processes) and capacity issues (workload and support services).[37]

Further studies could explore this phenomenon more and look at how an organisational culture more conducive to learning and change can be created. Attention should also be given to engaging staff in a process of critical reflection and to giving feedback in a way that encourages change.

The revised clinical criteria for the process of care should be considered by the Department of Health for inclusion in the integrated audit tool for non-communicable chronic diseases. Table 4 shows the modified criteria that are proposed for use in primary health care.

Table 4: Proposed audit criteria for CCF management in primary care

Type of criteria	Specific criteria
Structure	- Functional ECG machine - Functional X-ray machine - Functional haemoglobinmeter - Urinalysis testing strips - Medication in stock (Enalapril, Atenolol, Spironolactone, Furosemide, Digoxin) - Influenza vaccine available (in season)

Process	% of patients with an aetiological diagnosis recorded in the notes
	% of patients with a recording at every visit of:
	• Functional capacity
	• Precipitating/ exacerbating factors
	• Fluid status
	Cardiac rate and rhythm
	% of patients with the following investigations:
	• 12-lead ECG within past 12 months
	• Chest X-ray at least once from time of diagnosis with CCF
	• Haemoglobinometer reading within past 12 months
	• Creatinine within past 12 months
	Urinalysis within past 12 months
	% of patients with the following management options recorded:
	• Lifestyle modification advice offered within past 12 months
	• Vaccination against influenza offered within past 12 months
	• Prescribed ACEI
	• Prescribed diuretic
	• Prescribed beta- blocker
	• Prescribed spironolactone if indicated
	Prescribed digoxin if indicated
Outcome	% of all visits for CCF that are for exacerbations or emergencies during the last year
	% of patients hospitalised in the last year
	% of patients showing a functional improvement over the last year
	% of patients with SBP<140mmHg, and/or DBP<90mmHg

7. Conclusion

The current quality of care for CCF in primary health care is poor and needs to be improved. Clinicians were resistant to change and to taking on new tasks in relation to the management of patients with CCF. Resistance may have been related to a survival mentality

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and a need to protect themselves from additional demands, but also to the way in which the feedback was given. Nevertheless critical reflection led to substantial improvement in the clinical assessment of patients. Recommendations are made regarding future criteria which could be included in local audit tools.

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