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R. J. Kosgei, MBChB, PGDRM, USAID-AMPATH, Partnership, Eldoret, Kenya, Department of Clinical Medicine and Therapeutics, College of Health Sciences, University of Nairobi, P.O. Box 19676, Nairobi, Kenya, K. K. Wools-Kaloustian, MD, MS, P. Braitstein, PhD, J. E. Sidle, MD, USAID-AMPATH, Partnership, Eldoret, Kenya, Moi University School of Medicine, Eldoret, Kenya, Indiana University School of Medicine, Indianapolis, Indiana, USA, E. Sang, MSc, J. N. Gitau, MBChB, USAID-AMPATH, Partnership, Eldoret, Kenya, J. J. Sitienei, BSN, MPH, USAID-AMPATH, Partnership, Eldoret, Kenya, Moi University, School of Medicine, Eldoret, Kenya, R. Owino, RN, USAID-AMPATH, Partnership, Eldoret, Kenya, J. J. Mamlin, MD, USAID-AMPATH, Partnership, Eldoret, Kenya, Moi University School of Medicine, Eldoret, Kenya, Indiana University School of Medicine, Indianapolis, Indiana, USA, S. N. Kimaiyo, MBChB, MMed and A. M. Siika, MBChB, MMed, MS, USAID-AMPATH, Partnership, Eldoret, Kenya and Moi University School of Medicine, Eldoret, Kenya

Request for reprints to: Dr. R. J. Kosgei, P.O. Box 1523-00200, Nairobi, Kenya

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R. J. KOSGEI, K. K. WOOLS-KALOUSTIAN, P. BRAITSTEIN, J. E. SIDLE, E. SANG, J. N. GITAU,
J. J. SITIENEI, R. OWINO, J. J. MAMLIN, S. N. KIMAIYO and A. M. SIIKA

ABSTRACT

Background: United states Agency for International development-Academic Model for Providing Accesses to Healthcare (USAID-AMPATH) cares for over 80,000 HIV-infected patients. Express care (EC) model addresses challenges of: clinically stable patient's adherent to combined-antiretroviral-therapy with minimal need for clinician intervention and high risk patients newly initiated on cART with CD4 counts ≤ 100 cells/mm³ with frequent need for clinician intervention.

Objective: To improve patient outcomes without increasing clinic resources.

Design: A descriptive study of a clinician supervised shared nurse model.

Setting: USAID-AMPATH clinics, Western Kenya.

Results: Four thousand eight hundred and twenty four patients were seen during the pilot period, 90.4% were eligible for EC of whom 34.6% were enrolled. Nurses performed all traditional roles and attended to two thirds and three quarters of stable and high risk patient visits respectively. Clinicians attended to one third and one quarter of stable and high risk patient visits respectively and all visits ineligible for express care.

Conclusion: The EC model is feasible. Task shifting allowed stable patients to receive visits with nurses, while clinicians had more time to concentrate on patients that were new as well as more acutely ill patients.

INTRODUCTION

Two thirds (22.5 million) of HIV infected individuals live in sub-Saharan Africa with 28% of those in need of combined antiretroviral therapy (cART) receiving treatment. In Kenya, there are 1.4 million people infected with HIV (1). The scale-up of antiretroviral treatment (2) in sub-Saharan Africa has led to a strain on the existing human resource (3, 4). Sub-Saharan Africa is facing a crisis in human health resources due to a critical shortage of healthcare providers. The shortage is compounded by a high burden of infectious diseases; emigration of trained professionals; difficult working conditions and low motivation (5, 6). The World Health Organization advocates task-shifting, the process of delegating clinical care functions from more specialised to less specialised health workers, as a strategy to achieve the United Nations Millennium Development Goals (7).

Task shifting has been employed successfully in a range of health care systems. In Tanzania, upgrading clinical officers to assistant medical officers widened their scope of practice considerably; they were able to perform tasks such as emergency obstetric surgery and general surgery. The Nurses Act of 1997 in Zambia that provides for a greater set of tasks to be carried out by nurses, increased the scope of practice of nurses and midwives who can now do detailed physical examinations, insertion and removal of intrauterine devices, resuscitation including intubations, vacuum delivery/extraction and performing manual vacuum aspiration on post-abortion patients (5, 7). Kenya, Tanzania and Malawi are examples of African countries who train clinical officers who are doctor-substitute cadres. In Tanzania, training is the disciplines of general medicine and surgery, ophthalmology, radiology, dermatology, anaesthesiology and dentistry and in Kenya training

is in the disciplines of paediatrics, orthopaedics, ear nose and throat (8), ophthalmology, anaesthesiology and reproductive health (Caesarean section)(6). In Malawi, specialised orthopaedic clinical officers are trained to perform tasks which include: managing common fractures (closed reductions, castings, application of lower limb traction) prescription of orthotics such as simple caliper braces, carrying out tendon releases for post-polio contractures, incision and drainage of abscesses and debridement of open wounds (6).

The United States Agency for International Development - Academic Model for the Prevention and Treatment of HIV/AIDS Partnership (USAID-AMPATH Partnership; referred to as AMPATH hereafter) is providing comprehensive HIV/AIDS care in western Kenya and currently cares for over 80,000 HIV-infected patients. This large number of patients constrains programme resources. Two groups of patients posed particular challenges:

- i) clinically stable patient's adherent to cART who, regardless of their minimal need for clinician interaction must queue for medication re-fills
- ii) high risk patients with CD4 counts below 100 cells/ μ l at cART initiation who were commenced on weekly contact with the clinic for the first three months after start of treatment in order to reduce their high mortality rates. This intervention increased the number of visits from 4 to 12 in the first three months after start of cART (8, 9). The increasing patient volume was stretching AMPATH's resources beyond its capacity as such Express Care: a Clinician-Nurse Model was born with an aim to improve patient outcomes without increasing clinic resources. This paper describes the structure of this model.

MATERIALS AND METHODS

This was a clinic-based descriptive study of the pilot phase of Express Care which was conducted from March 1st to August 30th, 2007. Presentation of this data was approved by the regulatory bodies of Moi University School of Medicine and the Indiana University School of Medicine. Three clinics within the AMPATH system (one urban, one semi-urban and one rural) were chosen for this pilot because of their large patient volumes.

Original AMPATH HIV-Care Model: AMPATH has been fully described elsewhere(10-12). The original HIV-care model is a physician supervised, clinical officer (mid-level practitioner) centered model with an optimal staffing ratio of two clinical officers and nurses for the first 1000 patients and one clinical officer and nurse for every additional 750 patients. Clinical officers and nurses staff the clinics on a daily basis with physicians providing consultative

services within the clinics between 1-3 days per week depending on patient volume.

Clinic visits are scheduled two weeks after cART initiation and monthly thereafter. Patients not requiring cART are scheduled every 1-6 months depending on their clinical status. During clinic visits, all patients must be seen by the triage nurse and a physician or clinical officer (referred to as clinician hereafter), dispensing nurse or pharmaceutical technician and are subsequently referred for other ancillary services.

Express care model: The express care (EC) model houses the needs of both stable and high risk patients. The EC patient does not queue in the waiting bay or go through the nursing station, clinician room or other ancillary units. Instead the patient goes directly to the EC room which offers 'one stop care'. The referral form, generated by the clinician to EC is used by the EC nurse instead of the patient chart. Inclusion criteria for stable patients are: ≥ 18 years of age, stable on a cART regimen for > 6 months, CD4 counts ≥ 200 cells/ μ l, absence of an opportunistic infection, absence of chronic illness and history of perfect adherence. The clinician provides a referral form to EC and a one month supply of drugs for those who meet the criteria. The EC patients are seen by EC nurse for two subsequent monthly visits and the third visit is by a clinician thus providing EC patients with eight nurse visits and four clinician visits during the course of the year. Emphasis on EC visits is perfect adherence and drug re-fills. The EC nurse refers the patient to the clinician if symptomatic or has poor adherence.

On the other hand inclusion criteria for the high risk patient are: ≥ 18 years of age and an initial CD4 cell count of ≤ 100 cells/ μ l and new initiation of cART. The referral to EC is similar to stable patients except that the clinician provides the patient with a prescription for enough drugs to last until the next clinician visit. These patients, are seen by a clinician at cART initiation, two weeks after initiation and then monthly. Interim weekly visits are conducted by an EC nurse either by phone or in person. High risk patients will undergo 12 contacts in the first three months after cART initiation with nine nurse visits/contacts and three clinician visits. Emphasis during these visits is on adherence and alertness to potentially morbid complications of HIV/Treatment. During EC visits a brief structured symptom check list is reviewed and vital signs are taken, vital signs outside the pre-set cut points of oxygen saturation ($\leq 93\%$) and temperature ($\geq 37.2^\circ\text{C}$), a positive response to any item on the check list, and or poor adherence triggers a referral to the clinician.

Five data collection forms are used in the EC model, four exclusively designed for EC (a high risk patient referral form, a stable patient referral form, a

high risk EC encounter form and a stable patient EC encounter form). The fifth form is the adult encounter form, which is completed on every clinician visit. The EC referral forms collect information on patient eligibility for EC, current medications, date schedule for next lab draw, and the date of next clinic appointment. The EC follow-up forms collect data on whether or not the visit was scheduled, if the patient has complaints, if the patient picked-up medications at the visit, the date schedule for next lab draw, and the date of next clinic appointment. The adult encounter form collects data on vital signs including oxygen saturation, interim symptoms, adherence, and medication changes. Data from all forms are entered into the AMPATH Medical Records System (AMRS) which is a secure computerized database which uses an SQL platform. Data was extracted into SAS for this analysis.

RESULTS

At the end of the three month pilot 4824 adult patients were seen and 4362 (90.4%) of them were

eligible for express care with 3899 and 463 patients for stable and high risk respectively. Of those eligible 1508 (34.6%) were enrolled into EC with 1289 in the stable and 219 in the high risk protocol.

Clinicians were able to focus and concentrate on new and sicker patients. The nurses were comfortable with the level of tasks assigned to them and felt that they were effective in utilizing their skill in managing patients. Nurses were able to: (i) perform all their traditional roles, and (ii) consult for two thirds and three quarters of stable and high risk patient visits respectively. Clinicians were able to consult for: (i) one third and one quarter stable and high risk patient visits respectively, and (ii) all ineligible patients (sicker and new patients). This is demonstrated in the task shifting Tables 1 and 2. The time limit grafted in the task shifting tables for stable and high risk patient’s visits is one month and three months respectively.

Table 1

Task shifting with the stable patient EC visits (derived from WHO Task shifting: Global Recommendations and Guidelines)

	Standard of care			EC Model		
	P	CO	N	P	CO	N
Clinical Monitoring						
Monitor and support ART adherence	•••	***	***	•	*	**
Take weight			***			*
Take vitals			***			*
Determine functional status	•••	***			*	**
Request CD4 count and viral load	•••	***		•••	***	
Identify ART side effects	•••	***		•	*	**
Manage ART side effects	•••	***		•••	***	
Identify OI symptoms	•••	***		•	*	**
Manage OIs	•••	***		•••	***	
Dispense and arrange follow-up visits						
Dispense ART and drugs for OI prophylaxis					**	
Arrange follow-up visits						**
Manage substitutions or switch of ART						
Switch to alternative first line regimen	•••	***		•••	***	
Switch second line regimen	•••	***		•••	***	
Choose appropriate 3rd line	•••			•••		
Supervision						
Clinical officers	X	X		X	X	
Nurses		X		X		

Time grafted: one month

Responsible for an activity

*** Responsible during all visits

** Responsible during two thirds of visits

* Responsible during one third of visits

•••; •; X Physicians are responsible for all or part of the activity when present in the clinic

EC = Express Care; P= Physician; CO = Clinical Officer; N = Nurse

Table 2

Task shifting with the high risk patient EC visits (derived from WHO Task shifting: Global Recommendations and guidelines)

	Standard of care			EC Model		
	P	Co	N	P	CO	N
Clinic of monitoring						
Monitor and support ART adherence	*	*	*	*	*	***
Take weight			***			*
Take vitals			***			*
Determine functional status	***	***		*	*	**
Request CD4 count and viral load	***	***		***	***	
Identify ART side effects	***	***		*	*	**
Manage ART side effects	***	***		***	***	
Identify OI symptoms	***	***	*	*	**	
Manage OIs	●●●	***		●●●	***	
Dispense and arrange follow-up visits						
Dispense ART and drugs for OI prophylaxis						
Arrange follow-up visits						
Manage substitutions or switch of ART						
Switch to alternative first line regimen	●●●	***		●●●	***	
Switch second line regimen	●●●	***		●●●	***	
Choose appropriate 3 rd line	●●●			●●●		
Supervision						
Clinical officers	X	X		X	X	
Nurses		X			X	

Time grafted: three months

Responsible for an activity

*** Responsible during all visits

** Responsible during three quarter of visits

* Responsible during one quarter of visits

●●●; ●; X Physicians are responsible for all or part of the activity when present in the clinic

EC=Express Care; P=Physician ; CO=Clinical Officer ; N=Nurse

DISCUSSION

A major obstacle facing low income countries in ramping-up HIV care is the scarcity of health care providers' (13-15). To maximise access to cART in resource poor settings; decentralization of HIV care has been advocated, use of existing infrastructure and a shift from physician-centered models of care to non-physician centered models (13-17). With task shifting nurses can utilise the skill sets developed during their training with minimal additional training. Our findings along with those of MSF Malawi confirm the viability of increasing the role of nurses in HIV treatment programmes (18). EC has effectively shifted care from a physician supervised clinical officer centered model to a physician supervised shared clinical officer- nurse model. Task shifting

such as demonstrated in this paper, will assist in increasing cART access in resource poor settings while maintaining quality of care. In addition, it allowed the programme to provide more intense monitoring of high risk patients which was found by our programme in this same group of patients to result in a 50% reduction in the risk of death or lost to follow in our high risk population(19). This reduction in mortality was made possible by the increased clinic visits and monitoring of high risk patients.

EC was not without challenges; only 34.6% of the patients eligible for EC were referred and enrolled to the programme. Improving referral needs more intensive provider education. Increasing numbers of EC patients will eventually require an increase in the number of nursing staff as such task shifting does not completely eliminate the increased human resource needs of the AMPATH programme but modifies those

needs to a less expensive one. In addition, there is potential for returning to the vicious cycle of long queues if the EC population expands faster than nurses are identified and trained to provide care.

In conclusion, the express care model was found to be feasible and acceptable. Task shifting allows stable patients to receive brief visits with nurses, clinicians have more time to concentrate and focus on the new / sicker patients and more intensive monitoring of high risk patients. As such, in an environment where health care systems and donors are seeking innovative and cost effective ways to provide HIV-care to large numbers of patients the express care model offers a viable option to tradition models of HIV-care.

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