

Global Oncology Fellowship Electives: The Impact on Cancer Care and International Collaborations

Authors: J. Butonzi¹; V. Forbes³; C. Kigonya²; F. Lansigan³; T. Davis³; K. Figueroa⁴; D. Ruhangaza¹; K. Shabani¹; P. Nininahazwe¹; E. Nkunsi¹; O. Habimana¹; J. Haley⁵; L. Buswell⁵; C. Costa³; A. Hill³; P. Sharma⁶; C. Hanna⁸; A. Fehr²; B. DeBoer⁷; P. Park²; F. Sebahungu¹; E. Mpanumusingo¹; C. Shyirambere²; T. Mpunga¹; L. N. Shulman⁸; M. Chamberlin^{3,*}

Affiliations: ¹Ministry of Health of Rwanda at the Butaro Hospital Cancer Center of Excellence (BCCOE); ²Inshuti Mu Buzima/Partners In Health at BCCOE; ³Geisel School of Medicine at Dartmouth, Hanover, NH; ⁴University of Global Health Equity Kigali, Rwanda; ⁵Dana Farber Cancer Institute Dept of Global Health, ⁶University of Vermont Dept. of Hematology-Oncology, ⁷University of San Francisco Dept. of Hematology-Oncology, ⁸University of Pennsylvania Center for Global Cancer Medicine

ABSTRACT

BACKGROUND: To meet the rising demand for cancer care in low- and middle-income countries (LMICs), educational partnerships are needed. The Geisel School of Medicine at Dartmouth (GSMD) Hematology-Oncology Fellowship Program (HOF) piloted a bi-annual elective in Rwanda supervised by GSMD faculty.

OBJECTIVE: Exchange of knowledge and collaborations regarding treatment of advanced cancer in a low-resource setting.

METHODS: Program objectives were implemented by GSMD HOF, Rwandan Ministry of Health, the NGO Partners In Health, and the Butaro Hospital Cancer Center of Excellence (BCCOE) in Butaro, Rwanda. Education, organizational changes, research projects, and funding sources were tracked. Fellows were evaluated using American College of Graduate Medical Education clinical competencies.

RESULTS: The two-year pilot program was 100% enrolled. Ten educational, research, and organizational projects were implemented. Three grant proposals are in process. Fifty percent of participating Fellows plan to pursue careers in Global Health. The Hematology-Oncology (HO) Fellows gained perspective on cancer care capacity-building in a LMIC, and confidence in teaching. BCCOE staff gained knowledge and mentorship, ideas for quality improvement, and increased expertise with treatment protocols. Rwandan and U.S. colleagues valued the solidarity generated by the regular exchange, and a long-term commitment is planned.

CONCLUSION: A Global Oncology Fellowship elective is feasible and has a qualitative impact on care delivery and collaboration in LMICs influencing Fellows' career choices and professional growth of colleagues at partner sites. Long-term partnerships complement the task-sharing approach to cancer care. Financial sustainability requires formal institutional support for faculty participation.

Keywords (MeSH): Medical education, global oncology, global health, low resource setting, fellowship

*Corresponding author: Mary D. Chamberlin, MD. Email: Mary.D.Chamberlin@hitchcock.org; **Potential Conflicts of Interest (CoI):** All authors: no potential conflicts of interest disclosed; **Funding:** All authors: no funding was disclosed; **Academic Integrity.** All authors confirm that they have made substantial academic contributions to this manuscript as defined by the ICMJE; **Ethics of human subject participation:** The study was approved by the local Institutional Review Board. Informed consent was sought and gained where applicable;
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INTRODUCTION

Over the last decade, cancer is increasingly recognized as a global health problem. More than half of cancer diagnoses are made in developing countries where the mortality rate is far higher than it is in developed countries. Despite the rising burden of cancer, opportunities for Global Oncology Education (GOE) at the Hematology-Oncology (HO) Fellowship level and as an academic discipline are lacking. In October 2016, the Geisel School of Medicine at Dartmouth (GSMD) piloted a twice yearly, faculty supervised, one-month elective program in Rwanda for HO Fellows enrolled in U.S. programs. This work documents the experience and goals for the future.

Rwanda was the site for this program because of GSMD's experience there through the Human Resources for Health Program, a seven-year training program launched by Rwanda President Paul Kagame and others in 2012 [1,2]. Over twenty-five GSMD faculty from a multitude of specialties participated in teaching and working with Rwandan physicians, medical students, and residents to increase the capacity to deliver health care across the disciplines from 2011-2018. Concomitantly, a constitutional principle identified health as a human right and the Rwandan Ministry of Health (RMOH) became aware of the need to develop and implement cancer services [3]. Through a partnership between the RMOH, the NGO Inshuti Mu Buzima (IMB)/Partners In Health, and experts from U.S. cancer centers, a public hospital in rural northern Burera district became the Butaro Cancer Center of Excellence (BCCOE).

Rationale: At the BCCOE, generalists in pediatrics and internal medicine, nurses, and general practitioners provide daily cancer care including the administration of chemotherapy, with weekly structured phone support from an international group of hematologists and oncologists. Treatment protocols were developed for the treatment of curable cancers and a small number of palliative protocols for patients with metastatic disease. Building on the work of the founders of BCCOE, we sought to help promote sustainability through training of clinicians from countries of all income levels [3].

To our knowledge, this is the only program of its kind in Rwanda. From the Fellowship perspective, the goal for the U.S. Fellow was to provide a safe and supervised unique educational opportunity in a low-resource country, expose the Fellow to a wider spectrum of disease states and presentations, improve communication skills and cultural sensitivity, and gain confidence in teaching skills, while potentially altering the Fellows' career path. Fellows were supervised by U.S. and Rwandan physicians, worked on multi-disciplinary teams, and received valuable feedback from the Rwandan medical staff. The attending faculty's goals were to supervise the Fellow and to participate in a mutual exchange of experience on cancer management including diagnosis, treatment, response assessment, and chemotherapy.

Secondary goals included an assessment for a potential Global Oncology Track within a traditional U.S. HO Fellowship Program

and the potential for U.S. academic faculty positions with a focus on Global Oncology Care in low-resource settings.

Objectives: To facilitate an exchange of knowledge in treating cancer in a region with limited resources. To broaden the education and experience of U.S. doctors enrolled in a Hematology-Oncology Fellowship program and Rwandan doctors trained in internal medicine providing specialized oncology care.

METHODS

Hematology-Oncology (HO) Fellows with an interest in Global Oncology Education (GOE) applied to the Geisel School of Medicine at Dartmouth (GSMD) HO Fellowship Program Director to work at Butaro Cancer Center of Excellence (BCCOE) under direct supervision by GSMD HO faculty on teams organized by BCCOE leadership. BCCOE staff directed orientation to the history and resources of cancer care at BCCOE, the structure of the clinic week, topics for lectures and trainings, and the role of each team member. Fellows and U.S. faculty gave lectures, performed chart and protocol reviews, taught on the wards, and contributed expertise to the weekly telemedicine conference calls. Categories of educational exchange were identified and tracked and evaluations were obtained. Missed Relative Value Units (RVU's) for U.S. faculty were tracked. Exchange observerships in U.S. HO clinics for Rwandan clinicians were offered. Our multi-directional learning paradigm was retrospectively evaluated based on the published reporting guideline aimed at developing evidence-based practice learning. The GREET checklist comprises 17 items which are recommended for reporting evidence-based practice educational interventions [11]. Our Global Oncology Fellowship Electives educational interventions are described in detail based on this checklist in the appendix.

Ethics: The pilot program was approved by the BCCOE Research Committee. IRB approval was not required as no personal health information was involved.

RESULTS

The two-year pilot program was 100% enrolled by Fellows from three U.S. HO programs and one third-year internal medicine resident accepted to HO Fellowship (n=4). Categories of Educational Exchange are reported in Table 1. Key features of the Multi-Directional Learning Paradigm are described in Table 2.

Evaluations of Fellows, faculty, and the pilot program were solicited from BCCOE staff with 10 evaluation forms per team distributed for a total of 40 evaluations. Evaluation methodology was based on the validated evaluation system from U.S. Residency and Fellowship programs called MedHub (www.medhub.com).

Fellows also evaluated the elective with 100% response rate (n=4). Evaluations were distributed manually for Team 1, electronically for Team 2 and 3, and manually again for Team 4. Return rates of evaluations were 20% for Team 1, 30% for Team 2, 20% for Team 3, and 80% for Team 4. Comments from evaluations are tabulated in Table 3.

Table 1: Educational Exchange Results of the Global Oncology Elective Two-Year Pilot Program

TEAM #	Team 1	Team 2	Team 3	Team 4
Fellows with career plans in Global Health	0	0	1	1
Rwandan Doctor Observership in U.S.	0	0	1	1
Lectures given by visiting HO Fellow	3	3	4	4
Research Mentorship opportunities	1	1	1	4
Rwanda National Protocols Reviewed	0	1	2	14
Organizational changes	0	1	1	3
Quality Improvement projects	0	0	1	1

BCCOE staff gained knowledge and mentorship, ideas for quality improvement, and increased expertise with treatment protocols. Rwandan and U.S. colleagues valued the solidarity generated by a long-term partnership. Faculty time in Rwanda was supported by

a combination of continuing medical education, business, and vacation time. Salary support was not provided. For each week of faculty participation, there was on average loss of 30 potential RVU's of productivity and 14 potential appointments.

Table 2: Multi-directional Learning Paradigm

Experiential Learning of the Fellow	Knowledge Sharing to BCCOE Staff	Knowledge Sharing to US Faculty
Learn about cancers not in the U.S.	Improve knowledge base about common cancers and treatments	Improve generalist skills in specialists
Develop cultural sensitivity and language skills	Give lectures and advise on clinical care delivery	Increase exposure to disease outside their usual practice
Develop new communication and teaching skills	Reinforce adherence to treatment protocols	Improve understanding of the challenges of cancer care in low-resource settings
Appreciate differences in delivering care in low- versus high-resource countries	Promote new ideas and discussions for research and quality improvement projects	Provide inspiration to create models to continue this exchange and balance within the U.S. system

Table 3. Comments from Evaluations (n=15/40; 37.5% return rate)

Visiting Faculty and Fellows need to stay longer	100%
Faculty and Fellows provided excellent teaching and knowledge exchange in a culturally sensitive and friendly manner	90%
Visiting Faculty and Fellows should provide more feedback to peers in Rwanda	50%
Interact more with all aspects of the hospital not just Oncology	10%
Lectures for General Practitioners in basic Oncology would be appreciated	10%

DISCUSSION

During the course of our two-year pilot program, we made many observations. Guidelines and protocols for cancer care adapted to low-resource settings are essential and require regular revisions to adapt to changing resources. Our Rwandan colleagues appreciated the reliability of our schedule and an Internist on Team-2 independently created schedules for the team in a manner similar to that of a Chief Resident, improving organization and medical education by maximizing the expertise and training needs of each team member [10].

There are many nuances to cancer care, such as how to assess response to chemotherapy, especially in the palliative setting, which are best taught by experienced oncologists. Assessing response to

chemotherapy would help prevent over-treating people beyond the point of benefit and potentially doing harm at increasing costs. An example of an educational program aimed at reducing harm comes from Ndayambaje et al. [9]. The authors sought to address the issue of the routine use of harmful and unnecessary episiotomies in Rwanda through an in-service mentoring intervention which was shown to decrease the episiotomy rate at Muhima Hospital.

Another nuance to cancer care is modifying guidelines to fit the needs of patients and the resources available. It has been shown that 75% of cancer centers in low-resource settings using international guidelines have to adapt them in some way to fit their setting [2] and this also requires experience to make the most appropriate modifications. A sustainable program would facili-

tate and ensure consistent consultant support from experienced providers with simultaneous capacity-building for the less experienced.

Without additional financial support to cover U.S. faculty to participate in international exchanges, it is difficult to find replacement providers and this results in poor continuity of care for our patients at our home institutions. At our institution, three months advance notice is required and two weeks per faculty member is the maximum time away that can be supported by the current clinical system of coverage. This is not ideal for the support of the BCCOE although it was sufficient for U.S. faculty in terms of their satisfaction with their participation. Anecdotally, all participating faculty members reported a renewed sense of appreciation for their area of expertise as the work at BCCOE is 100% patient care and teaching that is not diluted by the stresses of electronic medical records, billing, coding, and other administrative tasks demanded by the U.S. health care system. To increase the available time to spend in a LMIC within a U.S. faculty position, creative models need to be derived. For example, a Global Oncology career model could include a shared U.S. clinical practice between two oncologists interested in working in LMICs. Both faculty members would be equally familiar with all patients and could provide similar continuity of care to the patients while the other works abroad. This model could allow for each faculty member to spend two to three months per year, which would translate to six months per year of consultants for BCCOE or a similar cancer center in a low-resource setting.

This institutional partnership model could make a mid-career oncologist more affordable for cancer centers in low-resource settings and provide more on-the-ground training and consulting. Acceptance of oncology care in low-resource settings as an academic discipline will attract more Fellows and faculty without compromising their potential for academic promotion. Global Health is rapidly gaining popularity in advanced medical training programs and collaboration among Fellowships to create programs designed to train people for care in low-resource settings will increase the pool of available graduates to establish careers in this field.

Tissue-based research is also critical as it is now fully appreciated that different ethnic populations display variations in germ-line and somatic tumor mutations which can influence the incidence and biologic subtypes of cancer seen in different parts of the world [3,4,5]. Institutional partnerships can make the costs of research more feasible as well [6,7,8].

Future directions for this program include formal curriculum development for:

- Global Oncology Fellowship Electives at Butaro (BCCOE).
- Four-week Global Oncology Intensive Observership and Educational Exchange in the U.S. for Rwandan cancer providers.
- Two- to three-year Global Health track for Fellows committed to a career in Global Oncology, with a focus on outpatient care including Gynecologic Oncology and Pediatric Hematology-Oncology, and less time on intensive transplant services.

Others have stated “it is incumbent upon us as experienced oncologists to serve our neighbors and assist in decisions to provide the most ethical equitable cancer care possible [1].” Among the most important efforts towards sustainability is that of training, which needs to be directed at all levels of professionals, including Fellows, physicians, pathologists, nurses, community health workers, laboratory technicians and pharmacists [1]. To measure the efficacy and impact of these programs prospective implementation research is crucial.

Limitations to this description include single-institution faculty involvement, low initial evaluation response rates, and short duration of follow-up. A prospective, statistically powered study design to quantitatively measure the impact of this intervention was not the intent of this program as it was an exploratory pilot program to determine feasibility. As it is clearly feasible, the participants felt it was of interest to a broader audience as is, and a prospectively designed study with longer follow-up is indicated.

CONCLUSIONS

Our two-year pilot Program was successful in achieving its objectives of providing a multi-directional educational exchange with our colleagues in Rwanda, a career-changing opportunity for young oncologists in training, and career enhancement for U.S. faculty, several of whom plan to continue participating at least once per year. It was well received by the IMB staff at BCCOE and the Rwandan MOH. Faculty supported their trip as a three-way split between vacation time, CME time without CME credits, and Fellowship Business time. The “cost” in RVU’s could potentially be supplemented by philanthropy or other organizations to defray the cost to the institution and faculty member. It was challenging to create a team every six months without salary or administrative support, and to consistently find third-year Fellows for each team. By accepting Fellows from other institutions, we increased national Global Oncology interest and collegiality while broadening national and international exposure to the program. This program may stimulate interest in additional programs for other institutions and specialties to create similar initiatives throughout Rwanda.

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Appendix: Multi-directional Learning Paradigm based on the GREET Checklist

GREET Checklist 2016 [11]	Global Oncology Fellowship Electives Information
Component	
Intervention	Multi-directional learning paradigm for the Fellows, BCCOE staff, and U.S. faculty
Why	Provide a multi-directional educational exchange with colleagues in Rwanda, career-changing opportunity for Fellows, and career enhancement for U.S. faculty
What	Fellows and U.S. faculty provided lectures, protocol reviews, and contributed to conference calls. Evaluations were administered to BCCOE staff, Fellows, and U.S. faculty. Pens were given as incentives for completing the evaluation.
Who Provided	HO Fellows, BCCOE staff, and U.S. faculty
How	Individual and group interventions including bedside rounds, didactics and lectures, quality improvement projects, research mentorship, review of national protocols, and weekly consultative telemedicine phone calls
Where	BCCOE in Rwanda
When and How Much	Two-year pilot program consisting of teams every 6 months Daily bedside rounds on weekdays 14 teaching lectures given by HO Fellows Weekly consultative telemedicine phone calls 2 Quality Improvement projects 7 Research Mentorship opportunities 17 National Protocols reviewed
Planned Changes	The educational interventions were adapted based on the national protocol and resources available (i.e. choice of chemotherapy)
Unplanned Changes	Adaptations to lectures based on audience and clinical care administered based on national protocol and availability of resources and expertise as appropriate
How well	Pilot program 100% enrolled by Fellows Return rates for evaluations were 20 % for Team 1, 30% for Team 2, 20% for Team 3, and 80% for Team 4 Resulted in lectures given, research mentorship opportunities, review of national protocols, organizational changes, quality improvement projects, research presentations at national meetings, participation by Senior HO Fellows, and changing Fellow career plans in Global Health Positive comments from Evaluations