

PERSPECTIVE

Magrabi ICO Cameroon Eye Institute, Yaoundé, Cameroon: Ophthalmology Subspecialty Patient Care and Training Center in Central Africa



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- **PURPOSE:** To report establishment of the Magrabi ICO Cameroon Eye Institute at Yaoundé, Cameroon, as an ophthalmology subspecialty patient care and training center in Central Africa.
- **DESIGN:** Perspective.
- **METHODS:** Assessment of unpublished and published material.
- **RESULTS:** To improve, preserve and restore eye health and vision in a region with world-high prevalence of functional vision impairment and blindness, the Africa Eye Foundation established the Magrabi ICO Cameroon Eye Institute as an ophthalmology subspecialty patient care center for all in need and a training center for ophthalmologists, ophthalmology subspecialists, and allied personnel. In 2017, the year of its inauguration and the first year of operation, the Magrabi ICO Cameroon Eye Institute provided ophthalmology subspecialty care to more than 25 000 patients and surgery for pediatric and adult cataract, glaucoma, retinal disease, oculoplastic disorders, and other vision-threatening conditions. Outreach programs extended care to an additional 2500 individuals in rural communities and 7 training courses were conducted for ophthalmologists and allied personnel.
- **CONCLUSION:** Through ophthalmology subspecialty patient care and the training of ophthalmologists and allied

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personnel, Magrabi ICO Cameroon Eye Institute is acting to enhance vision and the quality of life for individuals and families in all segments of society. (Am J Ophthalmol 2019;197:98–104. © 2018 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>.)

TO IMPROVE, PRESERVE, AND RESTORE EYE HEALTH and vision for the people of Cameroon and the countries of Central Africa, the Magrabi ICO Cameroon Eye Institute at Yaoundé, Cameroon, was founded by the Africa Eye Foundation to serve Central Africa as a patient care center for ophthalmology comprehensive and subspecialty eye care to all in need regardless of ability to pay, and as a training center for ophthalmologists, ophthalmology residents, ophthalmology subspecialists, and allied personnel.

The World Health Organization has identified Sub-Saharan Africa and the subregion of Central Africa as a geographic area with world-high prevalence of functional vision impairment (visual acuity $\leq 20/60$ in the better-seeing eye) and blindness (visual acuity $\leq 20/400$ in the better-seeing eye).^{1,2} Associated with functional vision loss and blindness are decrease in quality of life for the affected individuals and families, in addition to the loss of productivity for society and the population as a whole.

At least 80% of vision loss and blindness is avoidable—either preventable or treatable—with currently available knowledge and technology.³ Thus, the location of the Magrabi ICO Cameroon Eye Institute at Yaoundé, Cameroon, offers an opportunity for expansion of productivity and enhancement in the quality of life for all segments of society.

AFRICA EYE FOUNDATION

THE MAGRABI ICO CAMEROON EYE INSTITUTE TRACES ITS origin to December 2009, when Drs Akef El-Maghraby,



FIGURE 1. International ophthalmology representatives at the future site of the Magrabi ICO Cameroon Eye Institute, December 2009. Left to right: Oback Village Chief, Dr Jean-Jacques C. DeLaey, Dr Bruce E. Spivey, Dr Daniel Etya’ale, Dr Bradley R. Straatsma, Dr Akef El-Maghraby, and representatives of Oback, the host village for the Institute. Photograph by Dr Soliman Aref.

Bruce Spivey, Bradley Straatsma, Daniel Etya’ale, Jean-Jacques DeLaey, and Soliman Aref—representatives of the Magrabi Foundation, the International Council of Ophthalmology (ICO), the International Council of Ophthalmology Foundation (ICO Foundation), and the That Every Life May Count Foundation—conducted a site visit and feasibility study at Yaoundé, the capital of Cameroon (Figure 1).

With encouragement by leaders of the Cameroon government, Yaoundé University, and Yaoundé University School of Medicine, as well as availability of a construction site, the visitors elected to form a single entity, the Africa Eye Foundation, and establish an ophthalmology subspecialty patient care and training center in Cameroon.

Since then, the Africa Eye Foundation—registered as a nonprofit foundation at Geneva, Switzerland, on August 12, 2010 and led by Dr Akef El-Maghraby as president—has focused on constructing, equipping, staffing, patient care activities, training programs, and oversight of the Magrabi ICO Cameroon Eye Institute (Table 1). In addition, Trustees of the Africa Eye Foundation have emphasized development of partnerships, donor support, and institutional self-sustainability.

MAGRABI ICO CAMEROON EYE INSTITUTE

- **PLANNING AND CONSTRUCTION:** The Magrabi ICO Cameroon Eye Institute is located on 50 000 square meters of dedicated land (secured by long-term lease) at Oback, a suburb of Yaoundé, Cameroon.

TABLE 1. Africa Eye Foundation Officers and Trustees

Akef El-Maghraby, M.D.	President
Amin elMaghraby	President Elect
Bradley R. Straatsma, M.D., J.D.	Vice President
Tamer Makary	Vice President
Bruce E. Spivey, M.D., M.S., M.Ed.	Secretary General
Serge Resnikoff, M.D., Ph.D.	Treasurer
Mutasim Alireza	Trustee
David E.I. Pyott, CBE	Trustee
Alfred Sommer, M.D., M.H.S.	Trustee
Hugh R. Taylor AC, M.D.	Trustee



FIGURE 2. Magrabi ICO Cameroon Eye Institute. Main Hospital Building (Right) and Outreach Building (Left), September 2016.

Comprehensive architectural plans for the construction site include provisions for the main hospital building, outreach building, screening clinics, training and education center, residential accommodations, and catering and service facilities.

Construction of the main hospital building, outreach building, and essential service facilities (Construction Phase 1) commenced with land leveling of the construction site in 2012 and continued to completion in September 2016 (Figure 2). The main hospital building contains adjacent sectors for ophthalmology outpatient examination and treatment, ophthalmology surgery, and inpatient care. Ophthalmology outpatient facilities provide areas for comprehensive ophthalmology and subspecialty facilities for cataract and refractive surgery, cornea, glaucoma, retina, neuro-ophthalmology, pediatric ophthalmology and strabismus, and oculoplastic and orbital surgery. Ophthalmology surgical facilities contain 3 advanced-technology operating rooms and related facilities for preoperative and postoperative patient care. Inpatient facilities provide accommodations for hospitalized patients in private rooms or small clusters.

The Outreach Building accommodates patients and family members in wards that provide hospital beds and



FIGURE 3. Dr Henry Nkumbe, Medical Director of the Magrabi ICO Cameroon Eye Institute, with outpatient examination equipment.

additional facilities. The patients and family members travel on the Institute's bus from community outreach programs to the Magrabi ICO Cameroon Eye Institute for surgery or acute care of eye disease.

- **OPHTHALMOLOGY EQUIPMENT:** Ophthalmology equipment of the highest quality has been obtained for the Magrabi ICO Cameroon Eye Institute by in-kind donation and purchase. Equipment items for ophthalmology subspecialty examination and treatment include an excimer laser for refractive surgery; systems for biometry, optical coherence tomography and imaging; and distinctive equipment for examination and treatment of children. Eye surgery facilities include phacoemulsification units for cataract surgery, retinal surgery systems, and anesthesia equipment for monitoring patient comfort and safety.

- **PROFESSIONAL STAFF:** The professional staff of the Magrabi ICO Cameroon Eye Institute is led by Henry Nkumbe, MD, Medical Director, cataract surgeon and Chief of the Retina Department (Figure 3). Dr Nkumbe is a highly skilled ophthalmologist with outstanding medical and ophthalmology training, extensive ophthalmology medical and surgical experience in Africa, and subspecialty training completed during a retinal surgery fellowship, 2 years in duration, at Aravind Eye Care System, India.

Ted Afetane, MD, cataract surgeon, Chief of the Pediatric Ophthalmology and Strabismus Department, and Chief of the Oculoplastic and Orbital Surgery Department, has completed excellent medical and ophthalmology training in addition to subspecialty training during a fellowship in pediatric ophthalmology and strabismus, more than 1 year in duration, at Chittagong, Bangladesh. Dr Afetane also completed subspecialty training during a fellowship in oculoplastic and orbital surgery at Aravind Eye Care System, India.



FIGURE 4. (Top) On September 16, 2016, patient care services commenced at the Magrabi ICO, Cameroon Eye Institute with the first patients from the immediately adjacent community of Oback. (Bottom) Patients received ophthalmology subspecialty examination and treatment.

Additional ophthalmology subspecialists from the Magrabi Hospitals and Aravind Eye Care System are joining the staff at Magrabi ICO Cameroon Eye Institute to provide services while ophthalmologists from Cameroon and other African countries complete subspecialty fellowship training prior to joining the Magrabi ICO Cameroon Eye Institute professional staff.

The staff at Magrabi ICO Cameroon Eye Institute is further augmented by skilled medical specialists and experienced management personnel. Medical staff includes specialists in related medical specialties, anesthesia, optometry, refraction, ophthalmic nurse disciplines, and ophthalmic technician services. Management personnel consist of finance and budget specialists, patient program managers, equipment maintenance specialists, and communication coordinators.

- **COMMENCEMENT OF PATIENT CARE:** With construction of the main hospital building complete, ophthalmology equipment in place, skilled professionals on site, and a registry of several thousand patients waiting for eye care, patient care services commenced with a "soft opening" of outpatient services on September 16, 2016, and onset of



FIGURE 5. (Top) On March 29, 2017, the Magrabi ICO Cameroon Eye Institute was prepared for the official inauguration and arrival of distinguished guests. (Bottom) His Excellency Dr Philemon Yang, Cameroon Prime Minister and Head of Government (center of photograph), was joined by Dr Akel El-Maghraby, President of the Africa Eye Foundation (right of center) and several hundred guests at the ribbon cutting to inaugurate the Magrabi ICO Cameroon Eye Institute.

ophthalmology surgery shortly thereafter (Figure 4, Top and Bottom).

Commencement of patient care was associated with a baseline community-based Rapid Assessment of Avoidable Blindness and Diabetic Retinopathy (RAAB = DR) survey in Yaoundé. Results of this survey enabled preparations for the major categories of eye disease and guided planning for eye health and blindness prevention programs.

• **MAGRABI ICO CAMEROON EYE INSTITUTE INAUGURATION:** On March 29, 2017, Dr Akel El-Maghraby, President of the Africa Eye Foundation, joined His Excellency Dr Philemon Yang, Cameroon Prime Minister and Head of Government, in official inauguration of the Magrabi ICO Cameroon Eye Institute (Figure 5, Top and Bottom). With patronage of His Excellency Paul Biya, President of Cameroon, the inauguration was carried out in the presence of Cameroon government ministers, Africa Eye Foundation trustees, official guests, Institute staff, and several hundred community representatives.

Early on the morning of March 30, immediately following media announcement of the Magrabi ICO

Cameroon Eye Institute Inauguration, patients with scheduled appointments were joined at the door of the Institute by a long line of people who came in the hope of receiving examination and treatment. This spontaneous action reflected the great need for eye and vision care in Cameroon.

In 2017, with patient access to the Institute by public transportation and steadily increasing programs, the Magrabi ICO Cameroon Eye Institute provided ophthalmology subspecialty care to more than 25 000 patients and surgery for adult and pediatric cataract, glaucoma, vitreoretinal disease, oculoplastic disorders, corneal abnormalities, and other vision-threatening conditions. Concurrently, outreach programs at 16 sites extended eye care to an additional 2500 individuals in rural communities. Also in 2017, plans for full-time rotation of Yaoundé University ophthalmology residents to Magrabi ICO Cameroon Eye Institute progressed through the Yaoundé University affiliation process, ophthalmology subspecialty training in glaucoma commenced, and 7 training courses provided instruction for ophthalmologists and allied personnel. Of particular note, the Magrabi ICO Cameroon Eye Institute and the International Council of Ophthalmology co-organized an ICO Program Directors Course on September 1-2, 2017, that was attended by 45 educators from 6 nations in Sub-Saharan Africa (Figure 6).

DISCUSSION

WITH INAUGURATION OF THE MAGRABI ICO CAMEROON Eye Institute and completion of the first year of operations, 2 questions warrant discussion. First, how did this institute come into existence? Second, and equally important, how can the Magrabi ICO Cameroon Eye Institute become financially self-sustaining and continue as a long-term resource for eye care and ophthalmology training in Central Africa?

In addition to sustained leadership by the Africa Eye Foundation, clinical excellence, and effective management, a key element in establishment of the Magrabi ICO Cameroon Eye Institute was commitment of major financial support by generous personal donors, organizations, foundations, and corporations totaling—as of December 31, 2016—more than US\$8 200 000. Of this amount, donations by Dr and Mrs Akel El-Maghraby—including donations by their family members and the Magrabi Group Companies—provided more than US\$5 600 000. Dr and Mrs Akel El-Maghraby are the Founders who made possible the Magrabi ICO Cameroon Eye Institute.

The Africa Eye Foundation and the Magrabi ICO Cameroon Eye Institute also received donations and grant support from distinguished organizations, foundations, corporations, and philanthropic individuals throughout the



FIGURE 6. Co-organized at the Magrabi ICO Cameroon Eye Institute, the ICO Ophthalmology Program Directors Course on September 1-2, 2017 was attended by 45 participants from 6 Sub-Saharan countries: Burkina Faso, Cameroon, Congo, Gabon, Guinea Conakry, and Togo.

world. Major donors, partners, and granting organizations include Christian Blind Mission (CBM), Germany; Seeing is Believing – Standard Chartered Bank, United Kingdom; International Council of Ophthalmology (ICO), Switzerland; ICO Foundation, United States; Lions Clubs International Foundation, United States; ORBIS International, United Kingdom; United States Agency for International Development (USAID), United States; Alcon Laboratories, United States; Carl Zeiss Meditec, Germany; Essilor, France; Sightsavers, United Kingdom; Fred Hollows Foundation, Australia; Théa Foundation, France; Lavelle Fund for the Blind, United States; and IFA Systems, Germany. Partners who provided vital services without charge (pro bono) include Aravind Eye Care System and Latham and Watkins.

Further financial donations to the Magrabi ICO Cameroon Eye Institute were received from Africa Eye Foundation trustees and from generous individuals worldwide. Contributions by entities and individuals provided full funding for establishment and the commencement of patient care and training at the Magrabi ICO Cameroon Eye Institute.

The second key element in establishment of the Magrabi ICO Cameroon Eye Institute was the enthusiastic reception extended by the Cameroon government and the people of Cameroon. At the initial visit to Cameroon by representatives of international ophthalmology in 2009 and continuing throughout the years thereafter, the Africa Eye Foundation and Magrabi ICO Cameroon Eye Institute

received encouragement and all necessary authorizations and permits from the Republic of Cameroon government. The Magrabi ICO Cameroon Eye Institute was identified as crucial in helping to meet the urgent need for comprehensive eye care in the country and was consistent with Cameroon's "Health for All" policies, as well as the Cameroon National Strategic Plan for Eye Health: 2015–2019.

Cooperation was also evident in discussions with the rector of Yaoundé University, the dean of Yaoundé University School of Medicine, and faculty ophthalmologists. These Yaoundé University discussions set in place the plans for training of ophthalmology residents and ophthalmology subspecialists at Magrabi ICO Cameroon Eye Institute. Support by the Cameroon people was demonstrated during the initial visit through availability, on a long-term lease, of the substantial construction site at the village of Oback, a suburb of Yaoundé. Community support and the need for eye care services were also apparent in the registration of several thousand patients for eye examinations even before completion of the Magrabi ICO Cameroon Eye Institute's construction.

Regarding the second and equally important issue of financial sustainability, the Magrabi ICO Cameroon Eye Institute strives to attain financial sustainability for core programs of ophthalmology subspecialty patient care and training over a 3-to-5-year period by (1) judicious use of the Cameroon Cataract Development Impact Loan, (2) staged pricing for patient care, and

(3) effective management, efficiency of operations, and economies of scale.

The Cameroon Cataract Development Impact Loan announced on October 5, 2017 by the Overseas Private Investment Corporation, a United States government agency, is an innovative support mechanism that provides the Magrabi ICO Cameroon Eye Institute a loan of US\$2 000 000 financed by the Conrad N. Hilton Foundation, Fred Hollows Foundation, Sightsavers, and the Netri Foundation.⁴ The loan becomes a grant and is not repaid if 18 000 cataract operations and other specified targets of quality eye care for the people of Cameroon and adjacent countries are achieved in a 5-year period.

Staged pricing is a system that encourages each patient to pay for eye care services according to the patient's economic status. Patients who elect refractive surgery and thus avoid the need to wear glasses pay more than the actual cost of services and individuals of means who elect to receive in-country eye care rather than undergo expensive travel to Europe or another location pay somewhat more than actual cost. Patients of moderate economic status pay the cost of services. Patients of limited economic status pay less than the actual cost of services and those without means receive free care.

This system of staged pricing for services is successful in providing financial sustainability for millions of eye examinations and surgical procedures each year at Aravind Eye Care System, India.^{5,6} To our knowledge, however, this system has not been generally applied to eye care in Africa. Therefore, consultants and screening personnel from Aravind Eye Care System are engaged with local staff in implementing staged pricing at the Magrabi ICO Cameroon Eye Institute.

Additional activities to achieve financial self-sustainability are effective management, efficiency of operations, and economies of scale. Illustrating management, the Institute budget monitors performance for each month by reporting the number of new patient visits, return patient visits, ophthalmology laboratory procedures, minor surgery procedures, major surgical procedures, inpatient days, and outreach building patient days. For each category

of performance, revenue and direct cost are reported along with equivalent data for the same month of the prior year. To promote efficiency, ophthalmologists perform only the surgery and additional services that require the skill and knowledge of an ophthalmologist. Other members of the eye care team perform all additional services, which promotes efficiency without compromise in quality. To build economies of scale, patient volume is steadily increasing.

Funds from the Cataract Development Impact Loan, staged pricing, effective management, efficiency of operations, and economies of scale are projected to enable the Magrabi ICO Cameroon Eye Institute to become financially self-sustainable for fundamental operations over a 3-to-5-year period. Donations and grant funds can then be applied to progressive enhancement of staff and equipment, extension of services to additional geographic regions, increasing public awareness of eye disease, and research to advance quality eye care.

CONCLUSION

IN CONCLUSION, TO IMPROVE, PRESERVE, AND RESTORE EYE health and vision in a region with world-high prevalence of severe vision impairment and blindness, the Africa Eye Foundation established the Magrabi ICO Cameroon Eye Institute at Yaoundé, Cameroon, as a center for comprehensive and subspecialty eye care for all in need, regardless of ability to pay, and as a training center for ophthalmology residents, subspecialty fellows, and allied personnel. Central to its establishment have been the substantial financial support by Dr and Mrs Akef El-Maghraby, generous donations, and grants from entities and individuals worldwide; and cooperation from the Cameroon government and the people of Cameroon. To serve as a continuing resource for eye care and training, the Magrabi ICO Cameroon Eye Institute endeavors to become financially self-sustaining through judicious use of the Cameroon Cataract Development Impact Loan, a system of staged pricing for eye care, effective management, efficiency of operations, and economies of scale.

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