


BY MARTIN S. SPITZER, MD, FEBO[1,2], AND
PETROS C. KAYANGE, MD[1]
[1]Ophthalmology Unit, Department of Surgery, College of Medicine,
University of Malawi, Blanytre, Malawi
[2]Department of Ophthalmology, Tübingen University Hospital, Tübingen, Germany

The ZEISS VISUSCOUT 100 Handheld Fundus Camera – A Valuable Tool for Outreach Programs in Rural and Underserved Regions

First experiences from Malawi, Southeast Africa

Background

Malawi and its neighboring countries in Southeast Africa face an enormous shortage of medical personnel. There is currently less than one ophthalmologist per 1 million people. Most of the available eye care clinics are situated in the major cities – Blantyre and Lilongwe. Moreover, the costs of transportation are often prohibitive for many patients. Outreach programs, often held at local health stations or district hospitals, are therefore essential to provide some degree of eye care to those most in need. However, many outreaches concentrate on the diagnosis and treatment of cataracts and external eye diseases. As a result, retinal diseases or glaucoma are often not recognized or properly documented. At the moment, there are only two retina specialists residing in Malawi. Tele-ophthalmology using web-based wireless data transfer could be a viable approach in this situation, as nowadays more and more remote areas of Africa have internet access.

The VISUSCOUT® 100 from ZEISS is a mobile fundus camera that Carl Zeiss Meditec, Jena, Germany kindly donated to the Ophthalmology Unit of the College of Medicine at the University of Malawi in Blantyre, Malawi. This camera has a range of features that make it particularly suitable for use in outreaches. Packed into a small, rugged carrying case, it can be transported conveniently. Also, thanks to the camera's non-mydriatic operation and precise autofocus function, dilation of the eyes is not required. However, better image quality is often obtained

Figure 1: Training of ophthalmology residents using the ZEISS VISUSCOUT 100 handheld fundus camera.

when the patient's pupils are dilated. The camera's battery power provides added flexibility, while the optional WiFi functionality also enables the instant transfer of images to a PC or mobile device from which the images can be sent to a retina specialist for immediate online consultation. The camera enables easy image capture (color and red-free) and videos with a 40° field of view. The on-screen targeting aid and integrated autofocus function make using the device easy and convenient. Nine internal fixation LEDs help align the patient correctly and also facilitate the capture of peripheral images. Medical staff can capture images following a brief training program, enabling time-efficient work, which is especially useful for outreaches with limited time slots per patient. After eye care personnel (ophthalmologists, residents and clinical officers – Figure 1) have received comprehensive training, they can use the handheld fundus camera for documenting and clinical decision making during outreaches.

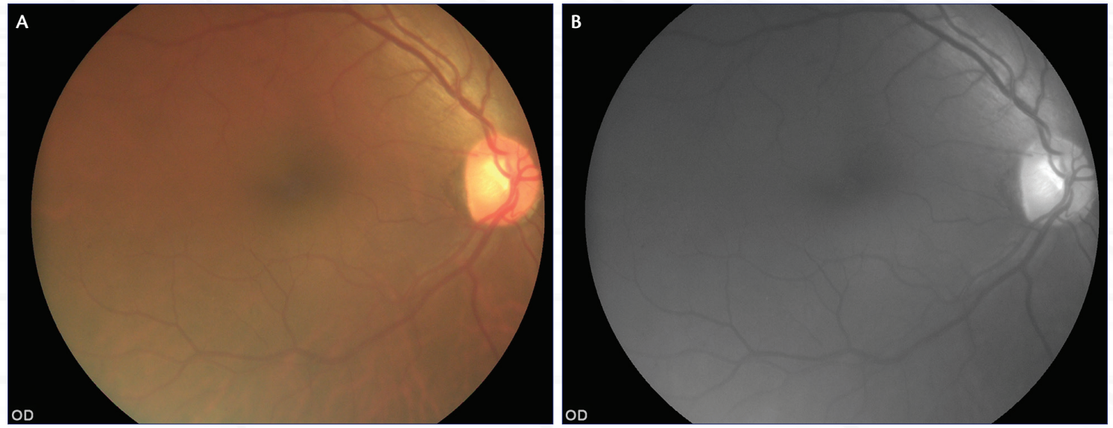

Figure 2: Color and red-free fundus image of the right eye showing no pathological changes.

Case report

A 21-year-old patient complaining of decreased vision in the right eye and right-sided pain during eye movements was seen during an outreach visit at a health center several hours by car away from the next eye hospital. An examination of the patient revealed that her Best Corrected Visual Acuity (BCVA) was 20/80 in the right and 20/20 in her left eye. The anterior segments of both eyes were unremarkable. A pronounced afferent pupillar defect (APD) of the right eye was observed. Fundoscopy could not be reliably performed by the available staff. Thus, fundus photographs were taken using the ZEISS VISUSCOUT 100 handheld fundus camera and sent online to the eye unit in Blantyre where a specialist diagnosed optic neuritis of the right eye due to the normal fundus findings (Figure 2). Based on the recommendation of this online consultation, the patient was given systemic intravenous high-dose corticosteroids. About two months later, the patient was seen for follow-up in his home district and it was noted that BCVA had increased to 20/20 in both eyes. The patient was free of any ophthalmological or neurological residual complaints.

The prevalence of sight-threatening diseases in developing countries is increasing, and along with it the need to provide structured care in order to avoid the long term effects such as loss of vision and blindness. The biggest hurdle facing most developing countries is the lack of resources and trained personnel to both screen and treat the large number of patients. These countries also have the additional problem of unequal distribution of resources between the urban and rural areas. To overcome these challenges, mobile diagnostics and treatment aided by the use of telemedicine may be useful – especially nowadays when even remote and neglected areas have internet access. The presented patient suffered from optic neuritis, a quite uncommon disease in Africa that may present differently than in whites. However, in our patient the use of telemedicine aided prompt diagnosis and saved the patient a long and expensive trip to the next eye hospital. The positive experience with the ZEISS VISUSCOUT 100 handheld fundus camera in Malawi could be replicated in countries facing similar difficulties.

References
Gupta A, Raman R, Sharma T. Evaluation of the effectiveness of diagnostic & management decision by teleophthalmology for retinal diseases. Indian J Med Res. 2014; 139: 954-955.
Yogesan K, Constable IJ, Barry CJ, Eikelboom RH, Morgan W, Tay-Kearney ML, Jitskaia L. J Glaucoma. 1999; 8: 297-301.
Pokroy R, Modi G, Saffer D. Optic neuritis in an urban black African community. Eye (Lond). 2001; 15:469-473.

EN_30_021_0001