

Part 3: The Arclight Project: Implementation workshops

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The Arclight Project aims to support and enhance the eyecare activities of those working in resource-poor settings. This includes training institutions, non-governmental organisations (NGOs), and ministries of health. We support, not just by developing frugal yet effective and affordable diagnostic devices, but also by creating educational tools and a range of interactive workshops that aim to deliver effective implementation. We have learnt from experience that simply giving a device to a healthcare worker does not necessarily mean it will be used correctly or even used at all.

To maximise the potential of our devices we have gradually created a range of teaching materials and embedded these in interactive workshops. These workshops can be on broad topics such as Primary Eye Care (PEC) or newborn eye screening targeting community-level healthcare workers or more disease focussed (diabetic retinopathy, retinopathy of prematurity and glaucoma) targeting more specialised eyecare professionals. Different workshops consequently use different devices depending on the focus of the initiative and the type of healthcare professional being trained.

The three main Arclight Project diagnostic tools are:

1. Wilson is an anterior segment loupe and otoscope suited to community level PEC initiatives.
2. The Arclight device, with the additional function of direct ophthalmoscopy, is aimed at mid-level healthcare workers such as nurses, clinical officers and eyecare professionals.
3. For dedicated eyecare professionals, the Arclight binocular indirect ophthalmoscope (BIO) is designed to identify sight threatening retinopathy related to diabetes and premature birth as well as other eye diseases that affect the back of the eye.

Training of the trainers

Typical training initiatives begin with a 'training of the trainers' workshop. These are attended by local eyecare professionals and led by established trained members of the Arclight Project



Wilson anterior segment loupe, Arclight device and the binocular indirect ophthalmoscope.

team. Participants are taught how to use the diagnostic tools and importantly how to lead a workshop themselves using the teaching materials. The trained trainers then go onto cascade training by delivering workshops themselves, initially supervised by a member of the Arclight Project team. In this way many diagnostic tools can be distributed effectively, and importantly, for the longer term, local training capacity established 'in-country'.

Interprofessional education

Delivery of quality eyecare is dependent on collaborative working between different disciplines in different levels of the healthcare system. It is recognised that

poor communication and collaborative working can lead to inefficient use of healthcare resources and lower-quality care [1]. Interprofessional education barriers to communication can be broken down and a greater appreciation and understanding of the roles of the whole team better understood [2].

We believe that fostering a collaborative approach among healthcare professionals can contribute to more effective integration of PEC within broader healthcare systems, supporting the World Health Organization's (WHO) goal of establishing Universal Health Coverage [3]. Interprofessional education has consequently been a theme we have actively promoted and evaluated



Trained trainers in Bhutan, Rwanda and Tanzania.





Training materials – coherent posters, handouts, mobile phone apps, simulation eyes, videos and presentations.

in our workshops as a means to amplify the impact of the eyecare training and equipping initiatives, where “participants from two or more professional groups learn with, from and about each other” [4,5]. This work has led to the successful completion of a global challenges research funded (GCRF) PhD as a collaboration between the Universities of Rwanda and St Andrews [6].

Training materials

A range of materials have been created to both train and assess participants in an engaging and interactive way. These include handouts, posters, presentations, videos, mobile phone-based applications, and simulation eyes. Content is linked across all themes being consistent and

coherent. To guarantee participants are actively involved in training, avoiding ‘death by PowerPoint’, frequent changes of format and regular tests are used to break up the sessions and ensure participants are ‘on their toes’ being active learners. The regular tests, both of knowledge and skill, allow trainers during the workshop to identify those who need extra support.

Integrate clinical exposure into classroom teaching using ‘casting’

Where possible we have integrated training with clinical exposure by examining real patients. This is the next step after examining simulation eyes as well as each other’s. This can help identify who is really achieving the training outcomes and who

needs more input. To enhance this clinical training experience even further, it is also possible to demonstrate ‘live’ examinations of patients as well as simulation eyes by ‘casting’. Attaching the Arlight to the camera of a mobile phone allows clinical signs to be displayed which can then also be ‘cast’ to a bigger screen [7]. More students can then see the examination more clearly. Importantly, it also offers slow-motion review of the clinical signs and annotation to explain findings. This has become a powerful and enjoyable way to teach in larger groups.

Primary eyecare training

We have developed our workshops to match the curriculum of WHO’s PEC training manual [8], with all materials freely available on our website [9,10]. With CBM Global and TanZanEye eyecare NGOs, over 2000 community healthcare workers in Tanzania, Zimbabwe and Malawi have now been trained and equipped to improve identification of eye disease more promptly.

Fundal ‘red’ reflex training

Several national training initiatives have been delivered in response to WHO’s recommendation that the fundal reflex should be performed with the Arlight in newborns and infants in low-resource settings [11]. To support this aim, a USAID grant was secured to develop comprehensive training materials which have now been used and refined in both Africa and Asia with Kilimanjaro Christian Medical Centre in Tanzania, Orbis International in Mongolia, and HCP CureBlindness in Bhutan. This has led to widespread community level expertise in newborn and infant eye and vision assessment. The teaching materials and how to deliver a workshop are also available on the website and YouTube channel [9,10].

Binocular indirect ophthalmoscope retinopathy screening for diabetes and prematurity

Dedicated simulation eyes have been developed to train and assess in the identification of sight threatening retinopathy from diabetes and premature birth using the Arlight BIO. Workshops have been delivered in the UK, Indonesia, Kenya, Zimbabwe and Rwanda in collaboration with a range of NGOs and training institutions.

The future

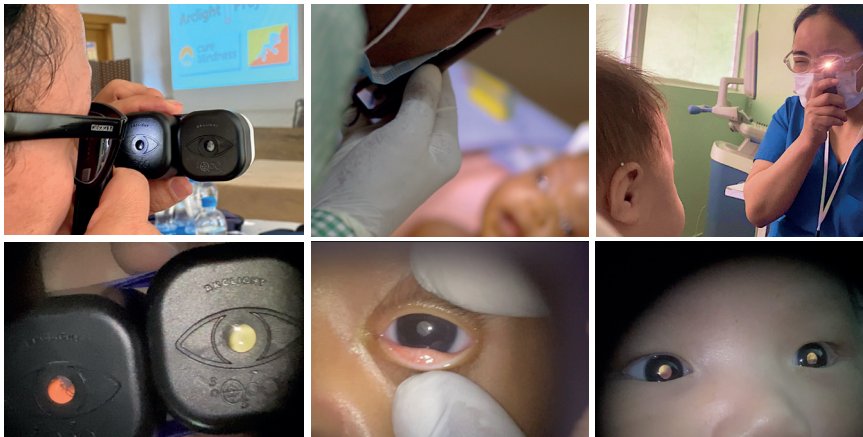
The Arlight Project can now be seen as a meaningful advancement in enhancing



Casting from a mobile phone to laptop or projector allows a group of participants to see an examination in detail which can then be reviewed and annotated.



Primary eyecare training and delivery in the community in Zimbabwe and Tanzania.



Fundal 'red' reflex training in Bhutan, Tanzania and Mongolia from 'classroom to clinic'.

eyecare in resource-poor settings. By integrating affordable diagnostic tools with comprehensive training programmes, it complements other major advances such as high-volume manual small incision cataract surgery, access to low-cost spectacles, and the growth of community-based PEC. The 'training of the trainers' approach also ensures sustainable skill transfer, empowering local professionals to expand their reach.

Looking ahead, the planned mobile phone application in multiple languages will broaden the accessibility of our training materials, ensuring wider adoption and implementation. By expanding our network of trained trainers and embracing both face-to-face and online training modalities, we aim to sustain the momentum of these advancements. Together, these innovations will contribute to reducing preventable blindness globally.

<https://medicine.st-andrews.ac.uk/arclight/>
<https://www.youtube.com/@arclightproject>

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[All links last accessed June 2024]



Binocular indirect ophthalmoscope retinopathy training workshops in Rwanda from classroom to clinic.

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Declaration of competing interests: Andrew Blaikie is a part-time employee of the University of St Andrews. The University own a subsidiary social enterprise that sells Arclight Project tools in the UK. Profits from these sales are used to support distribution of Arclight Project tools at cost price to resource poor countries. Andrew Blaikie has no direct financial benefit from sales.

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