New Flying Eye Hospital takes to the skies for its first programme

In June of this year, international eye care charity Orbis launched their new Flying Eye Hospital, a powerful tool helping the medical community combat preventable blindness through sustainable methods. On board an MD-10 aircraft, a fully accredited ophthalmic facility can be found that will travel the world to train medical teams in various subspecialities. The brand new facility replaces the charity's previous model, which served for 22 years and 299 programmes.

Six years in the making, its first programme was completed in Shenyang, China, in September and was the organisation's 40th Flying Eye Hospital programme in the country. Partnering with He University Eye Hospital, the programme delivered bespoke training opportunities, as well as creating a well-functioning education model for the hospital's residents.

Orbis transforms lives by preventing and treating avoidable blindness and visual impairment. They operate in countries across Africa, Asia and Latin America, training eye care teams, strengthening hospitals, screening for and treating eye diseases and educating local communities in eye health.

The big picture

Thirty-nine million people are blind globally and 80% have preventable or treatable conditions. What's more, 90% reside within a developing country where access to treatment is scarce. Blindness and poverty are intrinsically linked, with education and livelihood at stake.

Specifically in China, there are more than eight million blind people, representing almost 21% of the world's blind population. Cataract is the primary cause of visual disability, accounting for 40% of all blindness in China. The second leading cause is myopic retinopathy (16%), and the third is glaucoma (9.7%). China also has one of the highest myopia rates among children in the world with over 90% of poor vision in children due to uncorrected refractive error. The quality of refractive services is often poor in rural areas.

Additionally, a major problem in blindness prevention in China is the lack of quality eye care services and personnel in rural areas where they are most needed.

For example, according to 2008 National Eye Care Resources Survey, 44% of eye care institutes were located in eastern china, and 66% of ophthalmologists were based in big or medium cities. By the end of 2012, there werea total of 326 eye hospitals in the country, 70% of which were located in cities.

China's ophthalmic residency programmes usually provide limited hands on surgical training for residents and less than a third of trained junior ophthalmologists enjoy the opportunity to perform surgery regularly after graduation. The absence of standardised training programmes is a major obstacle in this process because skills transfer is not a priority for the practising staff, therefore it's difficult to do high quality hands-on-training for rural eye doctors of ophthalmology residents in China.

The World Bank identified cataract surgery as one of the most cost-effective health interventions available and for every $1 invested in eye health, approximately $4 is generated in economic value. It's estimated that childhood blindness costs the global economy between US$60 billion and US$270 billion in lost earning capacity, therefore, the implications of improving eye health systems are vast.

New plane, new technology

A team of 30 volunteers, including surgeons, anaesthetists and nurses from seven countries, worked over a three week programme to provide hands on training in the new facility. This facility has received the gold standard seal of approval from the American Association for Accreditation of Ambulatory Surgery Faculties International (AAAASFI). It features an operating theatre, pre and postop spaces, instrument sterilisation room, laser suite and 46 seat classroom, providing a workspace to teach many at one time in an environment that has everything to hand.

The plane is designed to be as self-sufficient as possible. The generators have been designed to operate with aviation fuel to create hospital grade air and clean water. The operating room can be found directly over the wings for optimal stability, limiting wind impact. There is an instrument sterilisation room which has been carefully constructed to comply with the most stringent international hygiene and airflow standards. And the learning space is certainly dynamic. The audio visual capabilities have received a serious upgrade from the previous model. Those in the classroom can view live surgeries and communicate with the surgeon via a two way microphone system, whilst also accessing the nurses training in the instrument sterilisation room and observing medical staff working in the pre and postop area.

What's more, the filming of surgeries are now captured and beamed to the classroom in 3D, providing those on board with essentially the same view as the surgeon peering down the microscope.

Medical professionals are also able to watch training broadcasts from Flying Eye Hospital programmes via the Orbis telemedicine platform Cybersight, expanding the facility's reach further. The procedures can be filmed in both 3D and 2D, ensuring those outside of the plane are not required to source supplementary equipment, simply a computer with an internet connection.

What makes a Flying Eye Hospital programme?

Flying Eye Hospital programmes are designed to enhance the specific needs of a partner, with careful assessments and subsequent planning taking place to produce each three to four week programme.

Assessing the local environment is a crucial element of a successful

skills exchange course and aside from implementing surgical techniques, provides volunteers with the opportunity to review practices. The charity champions that all members of the healthcare system must be trained in order to produce any lasting change, so ophthalmic, nursing, anaesthesia and bio-medical engineering needs are taken into account. Over 112 doctors and 61 nurses and other eye health professionals were trained during the Shenyang programme.

Clinical Lead of the Ophthalmic Theatre at the University Hospital of Wales, Ann-Marie Ablett, is a volunteer who has used her annual leave to train nurses on 30 programmes over 13 years. Ann-Marie says: "The local medical teams that Orbis work with are often functioning in the most difficult of situations, with limited power supply and extreme heat and do a fantastic job with the supplies they have."

This dedicated nurse has often discovered, however, that it's not uncommon for her peers to be working within operating theatres with no breaks and that simple changes will have a resounding impact. Therefore, Ann-Marie not only focuses on technical knowledge but also implements timetables to create structure to surgery lists.

All volunteers establish the World Health Organisation (WHO) Surgical Safety Checklist within Orbis partner hospitals, to increase safety standards.

Mr Larry Benjamin, Consultant Paediatric Ophthalmologist from Stoke Mandeville Hospital and long-time Orbis volunteer said: "The Flying Eye Hospital programmes and Hospital Based Programmes that Orbis run, provide a unique educational and teaching environment for all aspects of a sustainable eye care project."

Mr Benjamin has been on 14 volunteer assignments since 2004 and is also a member of the Orbis UK board. He has helped to train Zambia's first paediatric ophthalmologist. This example highlights the absence of specialised care that many countries are contending with.

Sustainability is the key to a conclusion

Orbis has always been committed to conducting training programmes, as opposed to mass surgery camps, with the hope that one day the charity will not be needed.

Flying Eye Hospital programmes form just one part of Orbis's work and operate alongside standalone hospital based programmes, long-term programmes, their telemedicine initiative and outreach work. The organisation will first improve tertiary facilities to ensure quality eye care can be received, before addressing secondary, primary and outreach programmes, to drive patients through the relevant referral pathway.

Orbis also advocates to presidents, prime ministers and health officials to promote the positive and tangible outcomes of investing in eye health to the governments where it operates. The plane is one very effective tool for helping to deliver this message.

What's clear is that this approach has inspired some long-term dedication from volunteers. Anaesthetist Ian Fleming from Kings College Hospital said: "The most striking thing is helping young children with bilateral cataracts, who have had poor vision from birth. The look on their faces when they realise mum or dad is no longer this blurred shape – it's utterly phenomenal to watch.

"I very much enjoy volunteering with Orbis because it works. We just don't go in and treat, we teach to ensure the effects of our visits can be seen long-term."

Ian is also a veteran when it comes to Orbis after joining the organisation in 2005. Eleven years and 16 programmes later, he remains as eager as ever.

Orbis's impact globally – case study

Twelve-year-old Giancarlo lives with primary congenital glaucoma. His parents realised shortly after birth that their son was suffering and took him to the local health centre, where he could not be helped. Three months later, they travelled to the Regional Institute of Ophthalmology in Trujillo.

Upon his arrival, Giancarlo was booked for emergency bilateral surgery with extreme ocular pressure in both eyes. At first, the procedure in his right eye appeared moderately successful, however, subsequent follow-up visits revealed the operation to be incomplete. The procedure upon his right eye failed and he lost all vision in that side.

When the Flying Eye Hospital visited the centre, it became apparent that Giancarlo's sight had become so severely limited that he only had vague light perception within his right eye. The surgeon implanted a drainage devise, slowing his rapid vision loss.

Dr James Brandt, Orbis Volunteer Ophthalmologist commented: "Unfortunately, in many countries paediatric glaucoma is managed identically to adult glaucoma, and that's really the wrong approach. There are very good operations for glaucoma in children that have yet been taught or implemented in the developing world. I've gotten primarily involved with Orbis to promote the proper management of paediatric glaucoma and develop expertise locally."

To register your interest to visit the facility in the UK in March go to: orbis.org/flying-eye-hospital-uk

SIX KEY POINTS

1. 39 million people in the world are blind and 80% struggle with preventable and treatable conditions.
2. It's estimated that childhood blindness costs the global economy between $60 billion and $270 billion in lost earning capacity.
3. Every $1 invested in eye health generates $4 in economic value.
4. Orbis runs training programmes for medical professionals to create sustainable and high quality eye health services for communities across the developing world.
5. Six years in the making, this plane will deliver advanced training programmes to eye care teams across the world.
6. Across a three week Flying Eye Hospital programme, Orbis trained 112 doctors and 61 medical professionals in Shenyang, China.