Necessity's son: Moorfields Eye Hospital

Daithí O hAnluain in London

IN 1805 Dr John Cunningham Saunders opened the Dispensary for Curing Diseases of the Eye to combat the trachoma epidemic that ripped through London in the wake of the Egyptian campaigns of the Napoleonic War. That act, born of necessity, ultimately led to Moorfields Eye Hospital, which celebrated its 200th birthday in March.

Necessity governs the hospital still as it continues to evolve. Moorfields developed a network of clinics throughout London, for example, to provide ophthalmic care close to the patient. The hospital developed a large-scale telemedicine program to offer its expertise to doctors in the developing world.

Necessity also governs Moorfields plan to open a 'hospital within a hospital', dedicated to service, research and teaching in paediatric ophthalmology, the International Children's Eye Hospital (ICEC). Moorfields also plans to develop a dedicated Clinical Trials Unit to meet the needs of increasing research outputs.

"We produce the largest volume of research literature in the world, with our partner institution, the Institute of Ophthalmology, which is based on the same site as us," said Bill Aylward MD, consultant ophthalmologist and Medical Director at Moorfields.

Current success masks turbulent history

Adapting to necessity over 200 years made Moorfields one of the largest and most successful eye centres in the world, as well as the most prolific. It has 270,000 outpatient appointments yearly, performs 22,000 surgeries and handles 48,000 A&E visits. This requires a workforce of 67 consultants, most of them leading authorities in their field, 300 nurses, and a support staff of 700.

But its vast size and venerable reputation now, masks a turbulent history fraught with incident. As a voluntary hospital, it provided its services to whoever required them, and relied on generous donors for help. It was frequently in debt and during WWII it received a direct hit from a Nazi 'V1 (a doodlebug').

In the face of these catastrophes the hospital persevered by focusing on its primary goal: patient care through clinical excellence and the development of new treatments.

In 1948 Moorfields received a measure of security when it became absorbed into the newly created National Health Service (NHS), the UK's public heath system that was free of charge at the point of care.

Courtesy of Bill Aylward MD

Moorfields Hospital following a direct hit by "doodlebug" bomb during World War II.

A strong team of sub-specialists

Even with this minimum of security Moorfields had to combat questions over the efficiency of a single speciality hospital. Presciently, in 1963, Dr Barrie Jones encouraged all consultants to specialise within one of the major fields of ophthalmology.

If Moorfields were to be just a single speciality hospital, then at least it would have the best specialists available. Again, developing a strong team of sub-specialists ensured the best possible patient care was available.

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This approach also took advantage of the vast number of patients passing through Moorfields doors, which provided a large caseload in all areas of ophthalmology. In a smaller or general hospital it's difficult to get the patient load required to train sub-specialists.

"We've got 12 specialists in glaucoma here at Moorfields. Many hospitals don't have 12 ophthalmologists in total", says Professor Peng Tee Khaw, glaucoma specialist at Moorfields.

The importance of relevance remained an issue into the 1990s.

"That's why we started developing our network of clinics across London. Patients want to be treated locally, and we had a patient focused service," says Mr Aylward.

Independent status

Recently, however, Moorfields became even more secure and independent when it achieved the status of a Foundation Hospital Trust. Hospitals that demonstrate world-class clinical care and hospital management can acquire Foundation status. It allows hospitals to raise their own finance and engage in new projects without the onerous political oversight that typically kills initiative in the public health system.

"That's how we can do our new children's hospital. There's no public money whatsoever going into that project. Most of it comes from private donations we've raised mainly through an appeal. But we were able to start the project a year early because we can underwrite any shortfall ourselves," said Dr Aylward.

It's an appeal made easier by Moorfields strong links with its former patients. Clinical expertise and respectful patient care means many former patients become active allies, eager to promote Moorfields and contribute to its work, either in time or money. The Friends of Moorfields is a charity run by well-wishers and former patients.

Knowledge cycle of research

Moorfields conducts research from 'bench to bedside'. Research ranges from short term, which aims for results in three years or less, to 'blue skies', an effort that requires more than 10 years before the clinical relevance becomes clear.

Research priorities come from an analysis of the 'knowledge cycle' – from observed phenomena in patients, through basic science, research hypothesis and clinical trials and then back to the patient in the form of improved clinical care. From this cycle researchers can quickly establish gaps in clinical understanding and focus research efforts there.

For example, it was the 'knowledge cycle' that led to the use of 5 Fluorouracil and low weight molecular heparin (LMWH) to prevent postoperative, proliferative vitreoretinopathy (PVR) in patients undergoing a vitrectomy and retinal reattachment for rhegmatogenous retinal detachment (Asaria et al, Ophthalmology (July 2001: 108; 7; 1179-1183)).

"Inspired by a child who lost his vision due to retinal scarring, we have carried out laboratory research into why the retina scars and the use of drugs including 5-fluorouracil to prevent this scarring. This simple regimen was developed, together with Bill Aylward and the Vitreo Retinal team. It's very inexpensive, just £4 per operation. The Moorfields trial was the first trial in the world to show that you can reduce scarring," said Professor Khaw, head of the Ocular Repair and Regeneration Biology lab at Moorfields and the Institute of Ophthalmology (IOO).

Matron making rounds during World War II.

The incidence of scarring dropped from 26.4% (placebo) to 12.6% (5 FU and LMWH; p, 0.02). An Ophthalmology editorial described the work as a landmark study in the field.

Research like this benefits enormously from Moorfields large patient load. Consultants see more cases, and particularly unusual cases, so their experience develops. Fundamental problems that might hide in a small sample suddenly come to light in a large sample. Also, any novel drugs, procedure or patient management scheme can be quickly tested and validated.

Bill Aylward

"It is the tremendously exciting research that the staff of Moorfields and the members of the Institute of Ophthalmology are conducting that places them on the forefront of eye research worldwide with their tremendous clinical resources and experience of Moorfields and the profound scientific ingenuity and the newly available tools of genetic and biomolecular science. It is clear that Moorfields will continue to make major contributions to the prevention for blindness for many years to come, said Professor Hugh Taylor, director of the Centre for Eye Research in Australia.

Long history in medical education

If research spreads Moorfields scientific expertise, teaching spreads its clinical and medical expertise worldwide. By 1810, five years after it's founding, Moorfields already taught ophthalmic treatment to doctors. Some of these later became missionaries, and took their skills, and Moorfields reputation abroad.

That tradition still exists with doctors from the UK and abroad trained in London. But the tradition expanded, too, and now includes special instruction days organised with other London hospitals. Moorfields even teaches abroad with courses like the Moorfields Macula and Moorfields Uveitis in Slovenia. Teaching also expanded through Moorfields telemedicine project, which helps doctors in developing countries with difficult cases.

"We'd like to increase our partnerships with institutions abroad, and we are examining other outreach options in the UK, the Middle East and China," said Mr Aylward.

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