

Progress for a more sustainable practice in ophthalmology

BY NEEL VYAS AND JOHN BUCHAN

Climate change is widely considered to be the greatest threat to health in the 21st century and is accompanied by other environmental considerations such as air and water pollution that impact on human health [1,2]. These problems are, in no small part, contributed to by current practices in ophthalmology as the highest volume speciality in the NHS, contributing 8.1% of all hospital outpatient visits nationally in 2018–19 [3]. A healthcare report from 2019 estimated 4.4% of global greenhouse gas (GHG) emissions can be attributed to the healthcare sector, ophthalmology therefore, being a substantial part of this [4]. We need to explore ways to become part of the solution rather than the problem.

The NHS has set a precedent for healthcare systems worldwide by aiming to become the world's first net zero national healthcare service by 2040 for direct emissions and 2045 for indirect emissions [5]. In 2021, The International Agency for Prevention of Blindness' (IAPB) Climate Action Working Group (CAWG) recommended 10 key objectives to address sustainability in eyecare [3,6]. This article outlines recent developments which aim to meet these objectives.

Lead and advocate

Leadership and advocacy for sustainable practice are the responsibility of all ophthalmologists in their own settings. Eye Sustain is an international organisation formed by the coalition of European and American ophthalmologists collaborating to improve sustainability of ophthalmic care. Their focus includes sustainability in operating room / clinic, drug waste, industry initiatives, and in mitigating the health impacts of climate change [7]. Research is conducted to develop evidence-based recommendations to bring policy change and adopt more sustainable practices. Carbon footprinting of all healthcare supplies found that 71% of GHG came from manufacture and disposal of equipment used in healthcare [8]. Within Eye Sustain, the Ophthalmic Instrument Cleaning and Sterilization task force published studies supporting the short-cycle instrument processing for sequential same day anterior

segment surgery and the reuse of phaco tips in a feasible and safe way to improve cost-effectiveness and reduce avoidable disposal of equipment [9]. But the UK is still a long way from permitting practitioners to recommence the practice of short-cycle unwrapped instrument sterilisation that was commonplace in the 20th century. The alleged risks of short-cycle instrument processing in the theatre setting have never been compared to the real and quantifiable risks associated with the excess consumption necessitated by wrapped, off-site sterilisation practices. Until such risks are compared, a rational conclusion regarding which choice best protects the patients we serve cannot be made.

Sustainable clinical practice

Surgery is known to be a carbon intensive process with a typical UK cataract operation estimated to generate 150–170kg CO₂e [10]. With over 500,000 cases in the NHS annually, we have a great opportunity to reduce GHG emission [11]. The UK and Ireland's surgical colleges have noticed this as an area needed to be addressed and summarised evidence to inform the formation of the 'Green Theatre Checklist' [12]. The checklist comprises of four sections: anaesthetic care, preparation for surgery, intraoperative and postoperative measures. Practices include minimising drug waste during the anaesthetic preparation, using reusable textiles (theatre hats, sterile gowns, trolley covers) and switching to low carbon alternatives (e.g. topical anaesthesia for cataract rather than sub-tenons). With only recent introduction of this surgical checklist in 2023, further studies are needed to determine the environmental benefits achieved.

Reduction in fossil fuel use

Patient travel to attend hospital outpatient appointments drives fossil fuel use with many appointments that can be either avoided or conducted via other means (e.g. telephone consultation). The Covid-19 pandemic was an opportunity for healthcare to transition to a more digital world. This has allowed many consultations to take place remotely using digital platforms, avoiding the need for patients to travel to

hospitals. Furthermore, the move to patient-initiated follow-up advocated by RCOphth has greatly reduced the need for patients to attend hospital follow-ups [13]. Relevant to the macula intravitreal service, a single intravitreal injection emits 13.68kg CO₂e, 77% of which is accounted for by patient travel. With macula conditions requiring repeated attendances by patients to have these injections results in a significant accumulation of GHG emissions. Research must focus on developing longer-acting agents to reduce the number of repeated injections required by patients in managing macula diseases [14].

Research and technology

Teleophthalmology is an emerging field which streamlines services provided by ophthalmic and optometric practices. It is estimated the carbon footprint contributed per sight test in the UK equates to 5.27kg CO₂e [15]. Teleophthalmology services have been pioneered in Scotland by allowing optometrists to apply smartphone-assisted slit-lamp examinations and ocular videography to enable ophthalmologists to view slit-lamp examination findings in real-time without the need for patients travelling to attend outpatient clinics [16]. This new technology offers savings to patients and hospital service providers and reduces the environmental impacts of travel and equipment use. Furthermore, technology is advancing and in the near future may allow monitoring chronic ocular diseases such as diabetic retinopathy, glaucoma and age-related macular degeneration without the need to attend appointments by introduction of home devices allowing examining of visual acuity and visual fields [17].

Education

The Medical Schools Council now endorses an Education for Sustainable Healthcare Curriculum and encourages the incorporation of sustainability as part of the teaching in medical schools [18]. The General Medical Council has set new requirements for UK graduates from medical schools to ensure the principles and practices of sustainability form an integral part of curricula [19]. Beyond medical schools, NHS England supports

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the environmentally sustainable healthcare programme developed by the Centre for Sustainable Healthcare and Health Education England Northeast to aid all healthcare staff to deliver healthcare in an environmentally sustainable way [20]. Education forms the foundation for newly qualified staff to act and change day-to-day practice with consideration of sustainability.

Conclusion

There are some reasons to be positive as we see changes in attitudes emerging through medical education and increased public awareness of the necessity to switch to more sustainable practices. However, without policy changes that accepts an increase in perceived risks, for instance, from reuse of eye drop bottles or local anaesthetic vials for multiple patients and rapid-cycle unwrapped autoclave in theatre – in order to mitigate the real risks caused by wasting resources (both financial and CO₂) – we must not continue with our current neglect of the risks associated with GHG emissions [21,22]. It will be important to advocate for changes internationally, although with the UK and other high-income countries having by far the largest eye health related carbon footprints, responsibility lies with us to work towards the objectives set out by the IAPB to improve sustainability in ophthalmology.

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