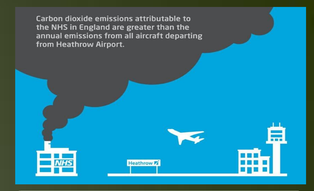
Going Green – A Sustainability Initiative by the Ophthalmic Directorate, Wolverhampton

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Introduction

- NHS contributes to 4-5% of the national carbon footprint
- A complete, single episode cataract surgery pathway in the UK is thought to emit 130 -180Kg of CO_2e per eye = driving > 500km by car[1,2]
- The above finding is mainly due to the procurement and energy expended towards buildings and travel
- NHS produces around 156,000 tonnes of clinical waste each year (incinerated or undergoes treatment at energy facility) = >400 loaded jumbo jets of waste
- 2020-21: Our hospital produced 1150 tons of clinical waste (£673k for incineration) and 701 tons of domestic waste (£152k) (fig 1)
- Project triggered by the absence of recycling practice in our Eye Unit and extensive use of orange clinical waste bags for incineration

Aims

- To bring in a culture of waste segregation at the point of usage allowing for a rapid, universally adaptable change in waste disposal practice, thus achieving a cost and environmental benefit
- To further implement the practice of waste segregation at source to all non-cataract procedures

References

1. Morris DS et al. The carbon footprint of cataract surgery. Eye (Lond). 2013 Apr;27(4):495-501.
2. Ophthalmology and the climate crisis: Time to take responsibility, Dr Redmer van Leeuwen and Dr Sjoerd Elferink, Ophthalmology Times Europe March 2022Volume 18 Issue 02
3. Thiel CL et al. Cataract surgery and environmental sustainability: Waste and lifecycle assessment of phacoemulsification at a private healthcare facility. J Cataract Refract Surg. 2017 Nov;43(11):1391-1398

Methods

- All non-patient contact waste from one routine cataract surgery was collected (anaesthetic room, scrub and prep room, theatre)
- Sharps and instruments were not included
- Worked closely with the Trust Waste Management team and theatre teams
- Contents segregated into recyclable, domestic and clinical waste
- New green recycling bags provided by the Trust (fig 2)
- Departmental education on the new process with an aide memoir (fig 3)

Waste Type	What happens to waste?	Cost to trust	
Yellow /Orange sacks, sharps	Incinerated	£850	Steam production for the hospital
Domestic waste	Incinerated /recycled	£155	Energy for Wolverhampton grid
Recycled waste	Recycled	£105	Carbon foot print saving = 100kg/ton

Figure 1: Table displaying how waste is managed at New Cross Hospital



Figure 2: Bags used for waste segregation



Figure 4: Comparison of waste produced from cataract surgery in different units

Item		Recyclable (Green)	Domestic (Clear)	Clinical (Orange)
Local anaesthetic equipment		Paper packaging of • Gloves • Sub tenons • Caps • Needles • Syringe	Plastic component of packaging	Gloves
Sterile gown		Paper wrapping of gown Paper component of the outside packaging	Plastic component of outside cover Hand towels	
Sterile gloves		Paper packaging of the gloves	Outer plastic packaging	Gloves
Trolley and patient drape		Paper component of outer packaging	Plastic component of outer packaging	Drape used on trolley Drape used on patient
Microscope caps		Paper component of outer packaging	Plastic component of packaging	
Phaco hand piece pack Phaco instrument tray		Paper part of the packaging	Any items that have not come into patient contact/ plastics	Any items that have come into patient contact (non-sharps)
Disposable equipment including blades, syringes and IA probes		Paper/cardboard component of the packaging *If all components are plastic, please place in domestic bin	Plastic components of the packaging	Any items that have come into patient contact (non-sharps)
Irrigation bottle and tubing				All tubing, BSS bottle and cassette
Intra ocular lens		Paper/cardboard component of the packaging	Plastic components of the packaging	Injector

Figure 3: Table displayed in theatres to help waste segregation

Results

- Each routine phaco produces around 1800g of waste (**840g of CO_2e**): Recycled- 500g,Domestic -100g,Clinical -1200g
- We undertake around 2600 phacos per year = 1300Kg of material can be recycled from phacos alone in our department

Discussion and Conclusions

- As a result of the positive outcome from changes with cataract surgery waste, the same process has been implemented for all non- cataract ophthalmic procedures
- Aravind Eye Hospital, India are pioneers in sustainable eye care while maintaining a very low endophthalmitis rate (0.01-0.03%) (figure 4)[3]
- According to the NOD database, 182,606 cataracts were operated on between 2020-2021
- Potentially 91,302kg (100 tons) of recyclable waste = about 10,000kg of carbon footprint saving= minimum of 27,777 Km of driving!
- We are implementing similar changes to waste segregation in Intra-vitreal Injections, Outpatient Clinics and the Minor Operation Service
- Making a small change of segregating the waste at the point of usage in every eye department across the country would at least encourage the practice of ‘ Going Green ‘ for better sustainability of our specialty