



## SUSQI PROJECT REPORT

### RecEYEcling

#### Start date of Project:

28/09/2023

#### Team Members:

Jessica Gowing - Dispensing Optician

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#### Background:

The ophthalmology team at Great Ormond Street Hospital is located in the Sight & Sound Building and provides outpatient appointments for patients with rare or complex eye conditions. A typical appointment in the department would involve assessment with various professionals and at a minimum, glasses dispensing on a yearly basis. For babies and some children, replacement of glasses is much more frequent as their face shape and prescription changes with their growth or eye procedures.

Due to the age of the patients requiring glasses (some are as young as 6 weeks old) and the nature of the conditions seen, many of the children cannot get a good fit with a standard pair of glasses and require a specialist paediatric frame, or a frame that has been heavily modified. The department relies heavily on the expertise of 'Tomato glasses', a manufacturer based in South Korea that produces fully adaptable frames according to various head shapes and sizes. These work well for many of the ophthalmology patients as they come in the very small sizes required for infants born with cataracts, and their adjustability makes them work well for patients with conditions such as craniosynostosis where the patient may have head and facial asymmetry and dysmorphic features. The problem faced is that these frames are imported, made from mostly plastic material and are frequently broken or outgrown and therefore have a short lifespan, with no instruction for green disposal.

The project aimed to create a recycling scheme for glasses. The benefits of recycling surpass the plastic saved as the scheme should reduce the average patient waiting time, hospital expenditure, staff administrative work, manufacturer materials, packaging and transportation.

#### Specific Aims:

This project aims to introduce a recycling scheme for Tomato Glasses whereby unwanted frames can be donated back to the department by patients and refurbished to be used for other patients, either as parts of frames, or full frames.

#### Methods:



Initially, we proposed to recycle all types of glasses frames, however when considering how to store the donated frames we realised there were potentially too many, and their quality would likely be degraded and unlikely to match suitably a frame in need of repair. Tomato glasses specifically, are designed to be adapted to the patients face and to be much more durable, and the manufacturer supplies the department with storage containers that are easily labelled. Therefore, we proceeded to initiate the recycling scheme for Tomato Glasses only in the first instance.

We created a questionnaire to determine how many patients' parents would be happy to get involved with the recycling scheme and used a QR code for them to easily answer the questions. Parents were asked to fill the questionnaire by their optometrist or dispensing optician. The survey showed that all parents would be happy to donate glasses back. The majority of parents were happy to have refurbished frames, and some parents were not keen on this idea. Therefore, we decided that we would mostly use donated glasses for repairs and always ask parents if they would be happy with a refurbished full frame.

We contacted a clinical and regulatory adviser from the Association of Optometrists, who advised that there is nothing in regulation to prohibit the use of older frames as spare parts (as long as it is not so old as to contain cellulose nitrate) and that it should be clear to patients that they are not receiving a brand-new spare part.

We discussed with our dispensing colleagues the potential disadvantages and advantages of the scheme and the consensus was that after some initial groundwork, the project would reduce the administrative workload and so we obtained their consent before initiating the scheme.

We communicated with our colleagues via e-mail that returned frames should be given to an optometrist or dispensing optician in the department. These would be stored in the dispensing opticians' room daily and sterilised using cleaning equipment already in the department. They are then stored in boxes provided by the manufacturers.

We quickly received a sufficient supply of frames, following requests for donations from parents, and so we were able to begin to use the frames as parts when a patient needed a repair. Rather than order parts from the manufacturer, the frames in the donated stock were used. The patient was informed of this and if they had an objection, would be allowed to order a new part. Patients who were involved with this scheme, are subsequently aware of the donations required and are asked to keep this in mind so that they can give back to the scheme in the future, where possible.

#### **Measurement:**

#### *Patient outcomes:*

When a patient has a repair done, this is documented on our system Epic. Any problems arising from the project would similarly be documented on Epic.

Typically, if a patient requires a repair, they would have to wait a few weeks for the part to be ordered and delivered to the hospital and then for it to be posted out to them. Having donated frames on site means that the repair can be done immediately, without waiting for ordering or delivery times. Normal delivery time is approximately 7 days. Where possible, we have the number of patients who received



repairs on the day rather than waiting for the new part to arrive was recorded in an excel spreadsheet, however at times this data was not recorded due to staff time constraints.

The donated frames are checked for damages and sterilised on site when they are received. When a patient has a repair or adjustment made to their glasses, this is always checked by a registered dispensing optician and this is no different when using donated frames. The dispensing opticians are registered with the General Optical Council and Association of British Dispensing Opticians and adhere to their professional standards.

#### *Environmental sustainability:*

The carbon footprint of the sides and fronts of Tomato glasses, and glasses cases was estimated using a process-based method. Materials and weights of the items plus their packaging was accounted for as well as transport from the manufacturer to GOSH and waste disposal. Emission factors for materials, transport and disposal were taken from the UK Government Greenhouse gas reporting: conversion factors 2023., the ICE database and Rizan et al 2021.

Our CO<sub>2</sub>e reduction was translated into miles driven using emission factor 0.3386 kgCO<sub>2</sub>e/ mile driven in an average car with unknown fuel, taken from the same Government database.

#### *Economic sustainability:*

Orders are recorded on a spreadsheet and data can be pulled from this on a monthly basis for analysis.

#### *Social sustainability:*

We have provided opportunities for staff and families to give informal feedback, summarised in the result section.

#### **Results:**

##### *Patient outcomes:*

To date there have been no problems arising from the project documented on Epic. As all frames are checked before potential reuse, there have been no instances of patients receiving a part or frame in poor condition.

Typically, if a patient requires a repair, they would have to wait at least 7 days for the part to be ordered and delivered to the hospital and then for it to be posted out to them. Having donated frames on site means that the repair can be done immediately, without waiting for ordering or delivery times. Often patients wait until their appointment to request a repair or adjustment and in these cases, the problem could potentially be resolved immediately. This is hugely beneficial as it means the patient is not without their glasses for a long period of time. This is crucial for paediatric patients as any disruption to the vision during the critical period can cause permanent visual loss.

#### *Environmental and economic sustainability:*

In the table you can see our projected annual savings based on an average number of parts saved per month.



Frame part	Carbon Footprint (kgCO2e)	Cost per part (£)	Average new parts saved per month	Carbon saving per year (kgCO2e)	Cost saving per year (£)
Side	0.02	12.30 + 2.90 shipping	16	3.84	2,918.40
Front	0.03	12.30 + 2.90 shipping	14	5.04	2,553.60
Whole frame	0.12		0	0	0
<b>TOTAL</b>				<b>9.68</b>	<b>5,472</b>

Each time a part is used from our recycled stock, it saves the NHS £12.30 (for a front or a side) plus £2.90 for shipping. Across a year, we anticipate savings of approximately £5,472 and 9.69 kgCO2e, equivalent to driving 28.6 miles in an average car.

*Social sustainability:*

Staff:

We have e-mail correspondence from colleagues with various job roles in the department (orthoptists, dispensing opticians and optometrists) who have endorsed the project. They have kindly shared ideas to support the project and although we are unable to measure it, we are aware that they have made an effort to discuss this with patients as awareness appears to have risen.

The project has sparked conversations between colleagues in the department around sustainability and encouraged teamwork as we rely on our colleagues to help support the scheme when discussing it with patients. We hope that this has influenced them positively outside of work too.

Quotes from staff:

*"Love this. Well done."*

*"That's a fantastic idea."*

*"This sounds like a great idea"*

*" What a brilliant initiative! I'd be very happy to support this..."*

Staff have also seen the direct benefits to patients,

*"I have done so many repairs on the day for patients that have aphakic prescriptions who are now not having to wait for their glasses to be repaired."*

Patients and families

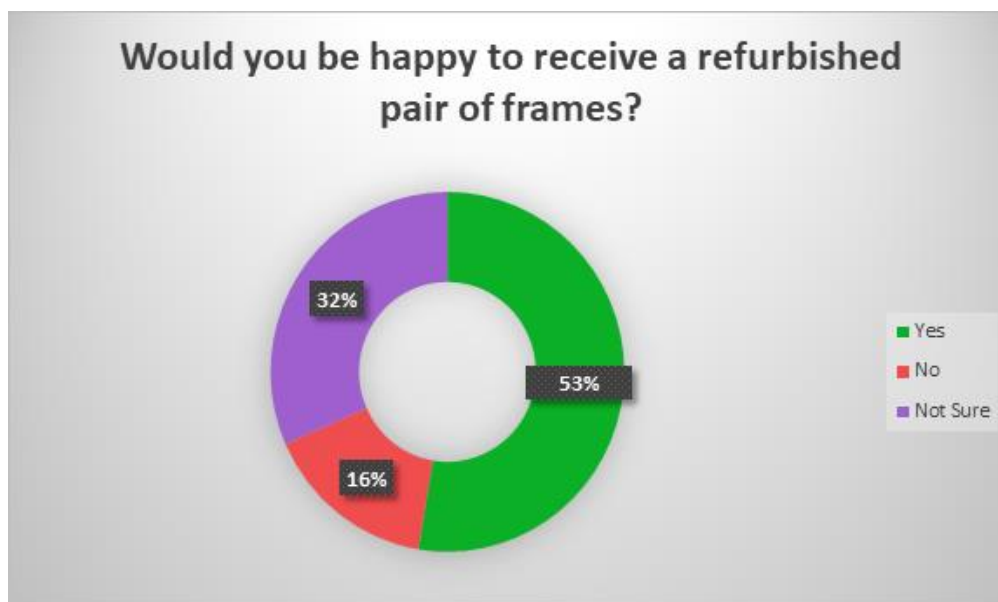
Our patient and family questionnaire has some encouraging responses from patients in the 'free-text' section. Further surveys could be conducted to more objectively measure the social impact as our survey was sent initially to understand if families would be supportive of the scheme and form part of the change.



The questionnaire identified that patients were not aware of some existing offers the dispensing opticians have, for example, being able to reglaze their own old frame. The majority (95%) of parents were not aware that GOSH would make lenses into two pairs of glasses with one voucher, rather than one whole new pair and 84% of parents would be interested in this (if the frames are in good condition, fitting and their child has temporary glasses while the repair is taking place). This has an impact on reducing new orders (and therefore materials and money) as well as a social impact for the patient, as in many cases, they prefer their current frame type.

The survey found that on average, patients have 2 – 3 pairs of old glasses at home, most parents were conscious of the environmental impact to some extent and all of them were happy to bring back old glasses to be recycled. If patients are aware that their glasses can be recycled and they won't just end up in landfill, this will hopefully encourage a good approach/attitude when it comes to taking care of their glasses and fewer repairs/replacement sets being needed in the future.

From the survey, 100% of parents reported that they would happily donate old glasses to be recycled. The pie chart below shows parents' response when asked if they would be happy to receive a refurbished pair. Parents main condition for participating in the scheme, is depending on the quality/condition of glasses and if a suitable size and colour frame can be found from the refurbished glasses available.



Quotes from parents:

*"Would be happy to find a meaningful way to recycle old glasses."*

*"Excellent idea and a no brainer for us!"*

*"For our next visit we could bring some old pairs of glasses to be recycled..."*

*"This is a great idea."*

*"...It may be better to have X amount of money we can use in frames and lenses per year..."*

Going forward, it would be great to get some feedback from children and their opinion on it.

### Discussion:

After the initial setup of the project, there are very few limitations or challenges. The staff within the opticians team just needed training on the new system and how everything was organised. The Tomato parts are easily stored and arranged into models, sizes and colours. There is already a UV lamp on site to sterilise the frames/parts. The only small risk is that if a part was recycled that had previously been damaged. We have tried to eliminate this risk as much as possible - every frame that is donated is checked by a qualified dispensing optician. Any parts that are not up to standard are disposed of.

The new process saves the opticians time as the repair can be completed on the same day. Previously, the part would have to be ordered with the supplier, a paper copy of the order would be filled in, a new order would be placed on Epic and the broken glasses stored until the part was delivered. Once the part arrived, we would then retrieve the broken frame and paperwork, fix the glasses and update the order on Epic. This means that this whole process has been avoided. The glasses are repaired as soon as they are received, Epic is updated and the patient can receive them straight back. This is also hugely beneficial for the patients as they don't have to make do with an old pair of glasses, or none at all. It is crucial that a patient wears their correct prescription, particularly during the period of plasticity when the eyes and vision are developing. Any interruption to clear vision during this period could potentially cause permanent visual loss.

Great Ormond Street Hospital has been supplying paediatric glasses since 2014. With no way of recycling these glasses, all were ending up in landfill. Although the carbon emissions for each individual pair of glasses are relatively small, around 3000 to 4000 pairs are dispensed every year. Although the current project has allowed us to recycle a small proportion of these, there are opportunities to increase this, and there are further recycling opportunities that we hope to take part in. Whilst researching this project, several schemes have been identified whereby all glasses and contact lenses can be recycled, as well as their packaging. For example, [Recycline](#) and [The ACUVUE® Contact Lens Recycling Programme](#). This would only require a small financial input to begin with. We also aim to encourage more reglazes of patient's own frames as the survey revealed that patients aren't always aware that this is an option.

We also hope that once more patients are aware that their glasses can be recycled it will encourage a good approach/attitude when it comes to taking care of their glasses and fewer repairs/replacement sets being needed in the future and further carbon savings.

### Conclusions:

The project has been a huge success, with benefits for our patients, staff and the environment. The support of the rest of the Ophthalmology department was vital in spreading the word and encouraging patients and their families to recycle their glasses. It was also wonderful to see how many families wanted to help in the project - many of whom have wanted to donate lots of old pair of glasses for years but haven't had a way in which to do this.

The main challenges we faced during this project were mainly to do with the time needed to set up the project when both clinicians are in busy clinics on every working day, however now it is in place, it will be easy to maintain and will hopefully grow further as our stock of donated parts increases.



Every Monday morning, the ophthalmology department has a teaching session - the team will present this project in one of these sessions which will hopefully spark more conversations and ideas within the department to further reduce our carbon emissions.

This project will now be continued indefinitely. Although we initially planned to update the MyGOSH app to advise parents of the recycling scheme, we haven't had time to complete all the required forms so this is something that we plan to do in the future. This way, all new patients to the ophthalmology department will be advised of the recycling scheme,

Going forward we hope to be able to recycle all the glasses that are dispensed at Great Ormond Street Hospital once they have fulfilled their use. This is something that all hospital eye departments could undertake.



## Critical success factors

Please select one or two of the below factors that you believe were most essential to ensure the success of your project changes.

People	Process	Resources	Context
<input checked="" type="checkbox"/> Patient involvement and/or appropriate information for patients - to raise awareness and understanding of intervention  <input type="checkbox"/> Staff engagement  <input type="checkbox"/> MDT / Cross-department communication  <input type="checkbox"/> Skills and capability of staff  <input type="checkbox"/> Team/service agreement that there is a problem and changes are suitable to trial (Knowledge and understanding of the issue)  <input type="checkbox"/> Support from senior organisational or system leaders	<input type="checkbox"/> clear guidance / evidence / policy to support the intervention.  <input type="checkbox"/> Incentivisation of the strategy – e.g., QOF in general practice  <input type="checkbox"/> systematic and coordinated approach  <input type="checkbox"/> clear, measurable targets  <input type="checkbox"/> long-term strategy for sustaining and embedding change developed in planning phase  <input type="checkbox"/> integrating the intervention into the natural workflow, team functions, technology systems, and incentive structures of the team/service/organisation	<input type="checkbox"/> Dedicated time  <input type="checkbox"/> QI training / information resources and organisation process / support  <input type="checkbox"/> Infrastructure capable of providing teams with information, data and equipment needed  <input type="checkbox"/> Research / evidence of change successfully implemented elsewhere  <input type="checkbox"/> Financial investment	<input type="checkbox"/> aims aligned with wider service, organisational or system goals.  <input checked="" type="checkbox"/> Links to patient benefits / clinical outcomes  <input checked="" type="checkbox"/> Links to staff benefits  <input type="checkbox"/> 'Permission' given through the organisational context, capacity and positive change culture.