

*The* ROYAL COLLEGE of  
OPHTHALMOLOGISTS

## Workforce Guidance

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# Cataract Services & Workforce Calculator Tool

**March 2021**

Date of review: March 2023

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[The Royal College of Ophthalmologists](#) (RCOphth) is the professional body for eye doctors, who are medically qualified and have undergone or are undergoing specialist training in the treatment and management of eye disease, including surgery. As an independent charity, we pride ourselves on providing impartial and clinically based evidence, putting patient care and safety at the heart of everything we do. Ophthalmologists are at the forefront of eye health services because of their extensive training and experience. The Royal College of Ophthalmologists received its Royal Charter in 1988 and has a membership of over 4,000 surgeons of all grades. We are not a regulatory body, but we work collaboratively with government, health and charity organisations to recommend and support improvements in the coordination and management of eye care both nationally and regionally.

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# 1. Introduction

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## Purpose

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This guidance aims to support local eye health systems, service leads and commissioners to plan and deliver safe, sustainable, and efficient cataract services to meet current and future demand. It seeks to enable accurate multidisciplinary workforce planning, using pathways that integrate primary and secondary care, and optimise patient flow in hospital.

The guidance provides a ‘workforce calculator’ to support workforce planning by calculating the staff needed to deliver cataract services using community or hospital-based pathways for the patient population.

It provides practical guidance for planning staffing and operating lists to utilise theatre time efficiently, considering complex cases and training.

## Context

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Cataract surgery is the UK’s most common elective operation, with approximately half a million operations performed each year.<sup>1</sup> It is one of the most cost effective, efficient, and successful operations in modern healthcare.<sup>2</sup> Data analysis published in our 2017 research *The Way Forward*<sup>3</sup> predicted demand for cataract surgery would continue to increase, rising by 25% over the next 10 years, and doubling by 2035.

However, our workforce data shows significant, persistent staffing gaps in the hospital ophthalmology and insufficient growth to fill current gaps, let alone support increasing demand.<sup>4</sup>

In response, hospital eye units around the UK have been redesigning their cataract services, introducing greater efficiency within the hospital,

and working more closely with primary care optometry to benefit from their capacity and skills.<sup>3</sup> This has resulted in a proliferation of pathways, models of care and delivery being developed around the country.

This wide geographical variation in the delivery of cataract services was identified by the Getting it Right First Time (GIRFT) programme,<sup>5</sup> and prompted development of the RCOphth [adult cataract commissioning guide](#) to help to standardise services in England.

The cataract service landscape is further complicated by the increasing involvement of independent sector providers delivering a rapidly growing volume of surgery to NHS cataract patients.

The COVID-19 lockdown created additional backlogs for cataract surgery, while COVID-19 safety measures, such as social distancing and swabbing, have slowed hospital throughput. Optimising efficiency and patient flow are crucial for recovering and improving cataract services after the pandemic.

## Pathways and workforce planning



During the pandemic, we advocated with the College of Optometrists for a joined up approach to cataract service development, in our [joint vision for future eye care services](#), including integration

of the primary care optometry team delivering pre and post-operative assessments. The decision for review either in the community or hospital eye service must ultimately be the responsibility of the operating surgeon, but where possible, only patients who have had complicated surgery and significant ocular co-morbidities should be seen by the hospital eye service post operatively.

In our joint guidance with GIRFT on [Restarting and Redesigning of Cataract Pathways](#), we set out our recommendations for delivering COVID-19 safe services and advised that service leads and commissioners carry out a detailed review of the whole cataract pathway to make long-term improvements to optimise patient flow.

Following this, GIRFT and the RCOphth are developing cataract hub pathway guidance,

setting out a framework for delivering high flow, low complexity cataract lists. The cataract hub pathway has four key components:

- referral from primary care optometrists
- preoperative assessment
- the day of surgery
- post-operative assessment by primary care optometrists.

We have consulted with key stakeholders and produced guidance to support the continuing development of cataract pathways, considering the work being done to improve referrals, optimise surgical throughput and implement post-operative review by primary care optometrists.

The pathways described in this document are intended to be flexible and applicable to a wide range of local systems and configurations, whether they use primary care optometry-led referral refinement and assessment prior to referral, or referrals using the GOS18 form. The workforce calculator is designed to give service leads the data and information needed to accurately plan the staffing needed to deliver quality cataract services that provide safe, accessible, and integrated patient care.

## Consultation and planning

Mr. Jonathan Bhargava, Consultant Ophthalmologist, Countess of Chester Hospital, Chester, was appointed to chair the Cataract Workforce Guidance Development Group [CWGDG].

Representatives from from primary care, secondary care and patient groups across the United Kingdom were invited to participate (See [section 7](#)).

The CWGDG considered current practice, Covid recovery, and plans for future service development, to identify suitable clinical pathways to use for workforce planning, and oversaw development of the 'Workforce Calculator Tool' and workforce planning guidance.

Stakeholders provided feedback on the proposed guidance through a public webinar and online consultation to complete the final guidance.

## 2. Objectives

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The Cataract Workforce Guidance document is intended to provide information on the optimum workforce required to deliver the hospital component of the cataract patient pathway but acknowledge the primary care pre- and post-operative assessment options as well.

The main objectives of the guidance are:

- To describe pathways of care to provide safe, efficient, and sustainable cataract services within the Hospital Eye Service
- To determine the surgical and multidisciplinary workforce required to support these pathways
- To calculate the demand for cataract surgery in the UK from the population aged over 50 in order to build prediction models to calculate the workforce required to meet the demand for cataract surgery for specific populations

The guidance and recommendations are:

- Evidence based
- Applicable UK wide
- Limited to adult cataract surgery only
- Complement out of hospital pathways and acknowledge the development work undertaken by other groups to develop this e.g. NHS England Eye Care Restoration & Transformation programme.
- Compliant with NICE guidance and GIRFT report recommendations
- Provide adequate experience to ensure an adequate supply of trained surgeons for the future
- Applicable to all providers of cataract surgery services in both the NHS and the independent sector.
- Designed to provide guidance on Immediate sequential bilateral cataract surgery for appropriate patients [IBSCS]<sup>10</sup>

### Out of scope:

- Organisation of primary care optometrists for pre-operative assessment and post-operative reviews
- Level of appropriate training for allied health professionals. Royal College of Nursing and College of Optometry provide guidance
- An absolute minimum standard for cataract numbers on an operating list
- Mixed operating lists

### Key questions:

1. To identify the rate of cataract surgery required to meet the demand from patients over the age of 50 over the next 10 years in the UK with subgroup analysis
2. To describe models of care to provide a safe, efficient, and sustainable cataract service within the Hospital Eye Service
3. To determine the workforce required to support each model of care
4. To build prediction models to calculate workforce requirements for specified populations

### 3. Recommendations: Staffing for cataract surgery pathways

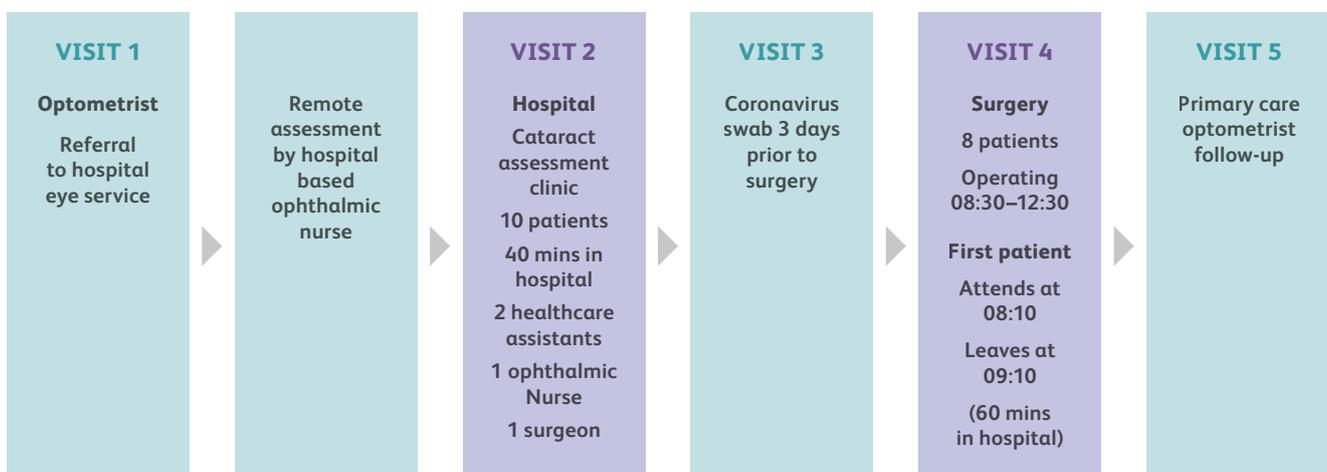
This section sets out three pathways for cataract surgery, including a community-based pathway and an immediate sequential bilateral cataract pathway. It provides detailed descriptions of each pathway with recommendations for staffing levels and training.

We considered the wide variation in case complexity and risk factors in cataract surgery as well as the essential need to train surgeons, so the pathways are flexible enough to allow for complex cases and differing levels of surgical skill. We have prioritised patient safety and aim to minimise patient exposure to the hospital environment.

With appropriate staffing, training and skill mix, more cases can be performed in a safe, non-time pressured environment. This will benefit patients through shorter waiting times for surgery. There are considerable differences in case complexity with differing risk factors, so it is essential for surgeons to devote adequate time to planning surgical operating lists incorporating sufficient time for complex cases and training.

The pathways are based on eight routine patients being seen on a four-hour operating list. However, we recognise that different factors effect surgical throughput and emphasise that this is not an absolute standard. We are aware of the widely differing configurations of Eye Departments and strongly recommend clinical facilities and reception areas for patients having cataract surgery are in close proximity to the operating theatre to optimise patient flow.

#### Hospital based cataract pathway



#### Visit 1: Initial referral

- Assessment by optometrist
- If cataract is found and the patient wishes to proceed to surgery, refer to the local or ‘choose and book’ cataract service

#### Remote assessment

- An experienced health care professional will contact the patient to discuss cataract surgery, its benefits and risks as well as the specific risks of COVID-19 infection. This practitioner should be familiar with the risks and complications of cataract surgery and COVID-19 infection to facilitate an informed discussion with the patient.

- The Royal College of Ophthalmologists ‘Shared Decision-Making Tool’ ([Appendix 1](#)) should be used
- If the patient wishes to proceed, a nursing assessment will be performed and the ‘Cataract listing proforma’ ([Appendix 2](#)) filled in. This document will follow the patient throughout their visits
- If the patient is suitable for local anaesthesia (the majority), the patient will be given an appointment to a cataract assessment clinic for biometry, dilated examination, and consent by a suitably qualified professional

Patients requiring general anaesthetic need to be seen and assessed via a specific clinical pathway. The 2020 RCOphth National Ophthalmology Database Report on the National Cataract Audit noted only 6,310 (4.4%) first eye surgery patients and 3,864 (3.9%) second eye surgery patients, were operated on under general anaesthesia or combined with local and/or topical anaesthesia.<sup>11</sup>

## Visit 2: Cataract assessment clinic

- Check visual acuity and biometry and dilate the pupil
- Check blood pressure, temperature, and pulse
- Discussion about admission for cataract surgery, post-operative care, COVID-19 swabs and provide an information leaflet
- The surgeon will take a history and examine the patient
- If cataract surgery is deemed appropriate it will be discussed with the patient. If the patient wishes to proceed, consent of specific needs of the patient will then be taken.<sup>12,13</sup> The patient will need to be informed that the surgery may be performed by a trainee.<sup>14,15</sup>
- The listing form is completed by the surgeon and an appropriate amount of operating time assigned depending upon case complexity or whether a trainee is performing the surgery
- This will allow the surgeon to accurately plan and fully utilise the operating list. ([Appendix 4](#))
- The date and time to attend for surgery should be confirmed with the patient
- They should be provided with dilating drops to be self-instilled one hour prior to surgery to reduce the time spent in hospital by the patient
- Clear written instructions will be given to the patient ([Appendix 3](#))

## Visit 3: Patient attends for a coronavirus swab (whilst NHSE guidelines require this)

## Visit 4: Surgery day

- Appointment times should be staggered to allow for social distancing and patients should be invited to attend 15 minutes before surgery
- The patient will be reviewed by nursing staff, ideally by the same nurses seen at the assessment
- On admission, the nurse will confirm the eye to be operated upon with the patient, consent form and operating list and then mark the eye to be operated on in line with local policies and the World Health Organisation [WHO] Surgical Safety Checklist
- Where possible we recommend the admitting nurse to mark one ‘arm’ of an ‘X’; above the operated eye, and then the surgeon completing the X in the anaesthetic room immediately prior to surgery. This will provide a robust two step marking process.
- The same nurse will take the patient to theatre and instil local anaesthetic drops and povidone iodine 5%. The surgical team will confirm the patient’s identity, the eye to be operated upon and mark

the second 'arm' of an X above the operated eye and then check the biometry for the appropriate intraocular lens implant in compliance with the WHO Surgical Safety Checklist and local policies.

- Patient to be reminded that a trainee will be contributing to the surgery under supervision <sup>14,15</sup>
- Whilst patient 1 is in theatre with nurse 1 and scrub nurse 1, patient 2 is being admitted by nurse 2
- Nurse 2 will bring patient 2 to the anaesthetic room ready to be seen by the surgeon
- Scrub nurse 2 will be preparing the surgical equipment for patient 2
- When surgery has been completed, nurse 1 will escort the patient to the discharge lounge
- The surgeon records the procedure then sees patient 2 in the anaesthetic room and the whole process starts again ([Appendix 4](#))
- Nurse 1 will confirm follow up arrangements at a primary care optometric practice that is participating in a post-operative cataract assessment system at around 4 weeks post-operatively with the patient
- The patient will be informed how to contact the surgical unit in the event of any post-operative concerns

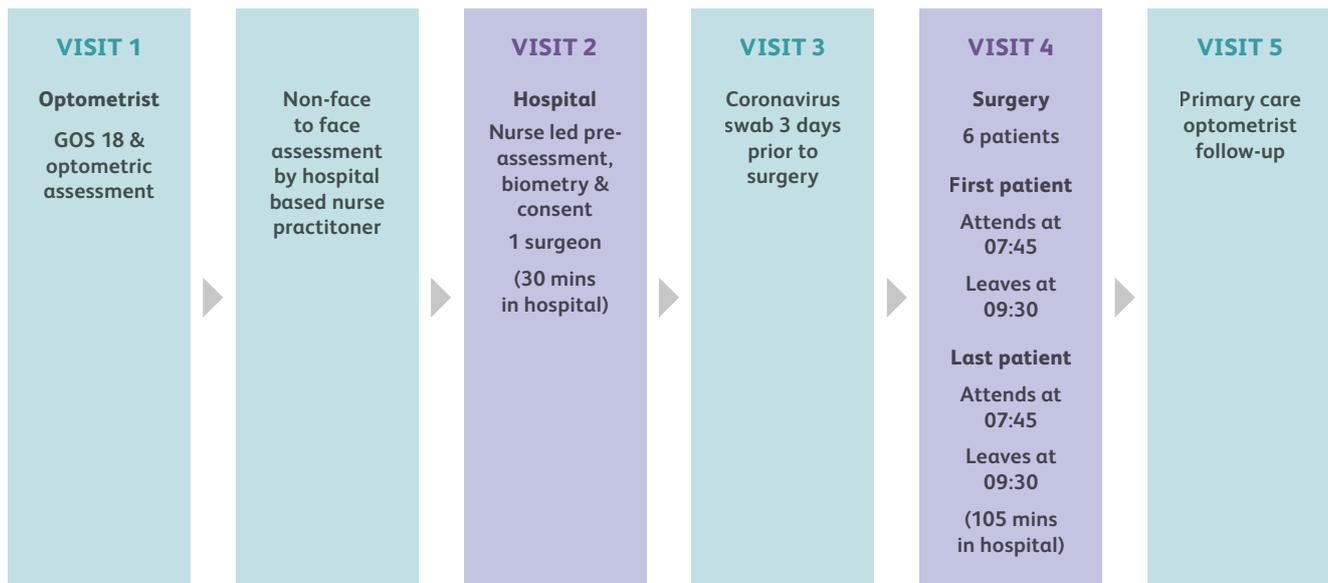
### Visit 5: Primary care optometric teams

- Post-operative examination to include refraction, anterior segment examination and intraocular pressure measurement
- Inform the cataract service of the postoperative outcome including refraction
- Refer for second eye surgery if appropriate

#### Hospital based cataract pathway summary:

- 6 patient 'events'
- 5 patient visits
- 3 in the community
- 2 in hospital
- 1 telephone consultation
- 100 minutes in hospital
- 8 eyes of 8 patients = 240 minutes of operating in a 240-minute (4 hour) session
- 2 theatre scrub nurses
- 2 theatre support workers
- 2 ward staff nurses
- 2 ward healthcare assistants
- 1 surgeon

## Community based cataract pathway



### Visit 1: Initial referral

- Assessment by an Optometrist
- If cataract is found and the patient would like to consider surgery, the Optometrist should examine and discuss cataract surgery
- Referral to cataract provider for pre-operative assessment if the patient would like to proceed with cataract surgery
- This ‘referral refinement’ will minimise unnecessary hospital appointments<sup>5</sup>

### Remote assessment

- Telephone assessment by an appropriately trained Health Care Professional who follows the same protocol as for the hospital-based pathway
- If the patient wishes to proceed, a nursing assessment will be performed and the ‘Cataract listing proforma’ ([Appendix 2](#)) completed
- An appointment would be made for the patient to attend a Nurse-led pre-admission assessment clinic for biometry and consent

### Visit 2: Nurse-led cataract assessment clinic

- Blood pressure, pulse and visual acuity checked
- Biometry will be performed by an appropriately trained healthcare professional
- If the patient is medically fit and cataract surgery is deemed appropriate it will be discussed with the patient
- If the patient wishes to proceed, consent will then be taken by an appropriately trained healthcare professional
- Current COVID-19 guidance and the need to attend for a coronavirus swab 3 days prior to surgery will be discussed in accordance with local NHS guidance

- The patient should be given a date and time to attend for surgery
- The patient should be provided with dilating drops to be self-instilled one hour prior to surgery to reduce the time spent in hospital by the patient
- Clear written instructions will be given to the patient. ([Appendix 3](#))
- The listing form is completed by the Nurse
- A standardised operating list should be completed to ensure adequate surgical time.
- Patients would be asked to attend 30 minutes prior to their surgery to allow for admission and surgical assessment. Please see [Appendix 6](#) for an example surgical timeline

### Visit 3: Patient attends for a coronavirus swab (whilst NHSE guidelines require this)

### Visit 4: Surgery day

- On the day of surgery, the patient will attend already 30 minutes prior to their surgery time diluted in a staggered manner to reduce interactions and allow for social distancing
- The patient will be admitted ideally by the same Nurses as at the assessment
- The Nurse will confirm the eye to be operated upon with the patient, consent form and operating list and then mark the eye in compliance with the WHO Surgical Safety Checklist and local policies
- The patient should meet and be examined by a member of the surgical team
- The Nurse would then take the patient to theatre and instil local anaesthetic drops and povidone iodine 5%
- The surgical team will confirm the patient's identity, the eye to be operated upon and check the biometry for the appropriate lens implant in compliance with the WHO Surgical Safety Checklist and local policies
- Whilst patient 1 is in theatre with Nurse 1 and Scrub nurse 1, patient 2 is being admitted by nurse 2
- Scrub nurse 2 will be preparing the surgical equipment for patient 2. Nurse 2 will bring patient 2 to the assessment room ready to be seen by the surgeon
- When surgery has been completed, nurse 1 will escort the patient to the discharge lounge
- The surgeon records the procedure then sees patient 2 in the anaesthetic room and the whole process starts again ([Appendix 5](#))
- Nurse 1 will confirm follow up arrangements at a primary care optometric teams practice that is participating in a post-operative cataract assessment system at around 4 weeks post-operatively with the patient. The patient will be informed how to contact the surgical unit in the event of any post-operative concerns.

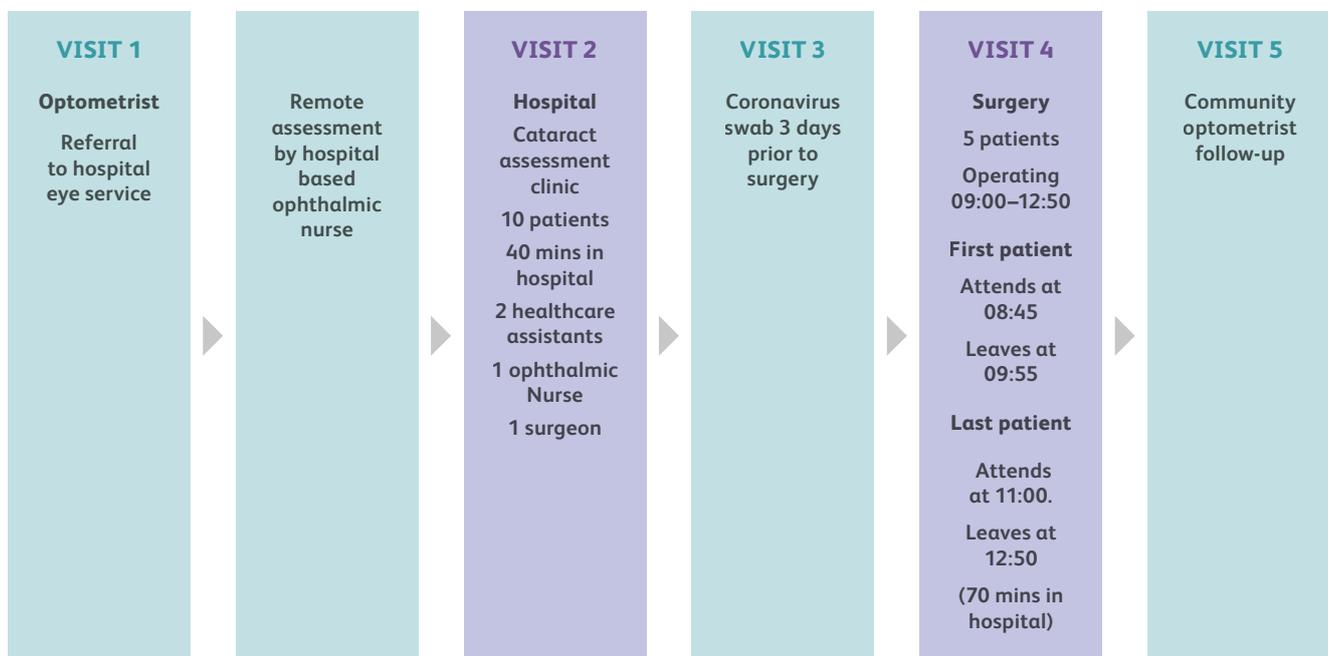
### Visit 5: Primary care optometry teams

- Post-operative examination to include refraction, anterior segment examination and intraocular pressure measurement
- Inform the cataract service of the postoperative outcome including refraction
- Refer for second eye surgery if appropriate

### Community based cataract pathway summary:

- 6 patient 'events'
- 5 patient visits
- 3 in the community
- 2 in the hospital
- 1 telephone consultation
- 135 minutes in hospital (per eye)
- 6 eyes of 6 patients = 120 minutes of operating in a 240-minute (4 hour) session
- 2 theatre scrub nurses
- 1 theatre support worker
- 2 ward staff nurses
- 1 ward healthcare assistant
- 1 surgeon

### Hospital based immediate sequential bilateral cataract pathway



Immediate sequential bilateral cataract surgery has been advocated as it provides more rapid visual rehabilitation, less inconvenience for the patient and improved efficiency.<sup>10</sup>

Concerns regarding complications that could cause bilateral blindness have hampered the adoption of ISBCS. However recent studies have confirmed that visual outcomes from ISBCS or as good as after surgery at separate times with no increase in operative complications.<sup>16-20</sup>

In the post-COVID-19 world, reduced time in hospital has become even more important for patient safety. ISBCS reduces the surgical time and patient visits to the hospital whilst providing an optimum visual outcome.

Careful assessment and patient selection are even more important in this scenario and this should be done in a cataract assessment clinic led by the operating surgeon. This assessment should include the patient's appropriateness for bilateral surgery and lack of risk factors.

- Thorough counselling needs to be undertaken to ensure that the patient is aware of the risk of bilateral endophthalmitis, however small.
- The patient will be in theatre for more time than that for single sided surgery and this should be considered in the assessment

The process will be much the same as traditional pathways and the patient listed for bilateral surgery at the cataract assessment clinic. This will allow adequate additional time for ISBCS

- ISBCS is treated as two completely different procedures

Steps in the pathways involving primary care optometrists would need to be commissioned at a local level.

[Appendix 6](#) shows a possible timeline for theatre. This is the best utilisation of theatre and surgeon's time. See Table 1 for a comparison of staffing requirements and theatre utilisation for the three pathways.

#### **Hospital based immediate sequential bilateral cataract pathway summary:**

- 6 patient 'events'
- 5 patient visits
- 3 in community
- 2 in hospital
- 1 telephone consultation
- 110 minutes in hospital for both eyes
- 5 patients (10 eyes) on operating list = 200 minutes of operating in a 240-minute (4 hour) session
- 1 cataract assessment clinic will provide cases for 2 theatre lists
- 2 theatre scrub nurses
- 2 theatre support workers
- 2 ward staff nurses
- 1 ward healthcare assistant
- 1 surgeon

## 4. Benefits and risks

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The benefits of all pathways are the streamlining of patient care, minimising patient-patient and staff-patient contact while optimising use of theatre capacity.

In the community setting, the patient would be made aware by the assessing optometrist of the pathway and likely waiting time.

In the hospital-based setting, cataract assessment clinics should be performed within a couple of weeks of the planned operation date, precluding the need for preoperative assessment on the day of surgery by the surgeon. Patients are given dilating drops to instil themselves on the day of surgery which minimises time in hospital.

Post-operatively, the discharge process should be swift as there is ample time for a comprehensive discussion with the Nurse who has accompanied the patient throughout their visit.

Community based post-operative clinics at an optometric practice of the patient's choice would reduce the number of hospital visits. Robust systems are already in place in many areas to provide this service. Second eye surgery could then be requested by the optometrist and the patient automatically booked by the hospital.

Inappropriately booked patients in either pathway could cause delays or cancellations on the day of surgery. Experienced staff performing the assessments and referrals are therefore vital along with multidisciplinary auditing of pathways and outcomes.

Specific arrangements are needed to ensure that the very small number of patients requiring sedation / general anaesthesia received surgery without excessive delay.

Any patient who is found to be COVID-19 positive would need to isolate for two weeks, in compliance with NHS guidelines and then be re-tested prior to surgery.

The community-based pathway would be ideally suited to those operating lists where both a consultant and trainee are present as this would enable one of the surgeons to operate whilst the other performs the assessment on the next patient. If there was just one surgeon operating and assessing, there would be a significant amount of time in which the operating theatre is not being utilised. This would also interfere with the surgical flow of patients.

Accurate and reliable assessments are required in both pathways.

Steps in the pathways involving primary care optometrists would need to be commissioned at a local level.

### Good practice points

The coronavirus pandemic has made it mandatory to minimise patient's exposure to the hospital environment. Both pathways effectively address this by reducing patient's visits and the time spent in hospital. There is a slight difference between the two in terms of number of visits, but when compared with current pathways and pre-operative assessment, the time spent in hospital is greatly reduced.

In terms of the patient experience, both pathways would improve continuity of care with just one nurse caring for the patient on the day of admission, reducing staff-patient exposure while providing ample opportunity for the patient to discuss any concerns or post-operative queries with the nurse. The choice of optometry practice for post-operative review can also be discussed.

This system would also optimise efficiency as the number of nursing handovers are reduced. Importantly, the flow in theatre would be optimised as well, leading to reduced downtime.

The hospital-based pathway would require two surgeon sessions, one for the assessment clinic and one operating list and this could facilitate either 9 cataract procedures in a 3-hour session or 12 in a 4-hour session.

## Barriers to change

Changes in practice may be difficult to implement in any environment but can be particularly difficult within the NHS. All levels of staff can be reluctant to change because they are comfortable with existing established practice. Surgeons may not feel motivated to perform more cases if their peers do not.

One size does not fit all and the formation of a cohesive team of dedicated Ophthalmic staff with the same aims and goals will facilitate an environment of excellence and efficiency to the benefit of patients.

For this to happen, all staff need appropriate training for their role which in many units will require investment, time, and planning.

There are many high-quality ophthalmic nursing courses throughout the United Kingdom, and it is essential that staff taking on these roles have the appropriate training to ensure that they are competent and confident in their roles and with their responsibilities. No one should be in a position where they are uncertain of their role or the process.

There is always a learning curve when change is introduced, but this can be managed safely by the gradual introduction of changes and ensuring the whole team understands the need for change and its benefits to patients and staff.

## Training ophthalmologists

It is essential to provide training for the next generation of ophthalmologists by ensuring they perform a sufficient number of surgical cases, have experience of the full range of cataract cases and acquire competence in managing complications.<sup>21,22</sup> This can easily be incorporated into either pathway. The community-based pathway would function more efficiently if there was more than one surgeon present. This would allow the greeting and pre-operative assessment of one patient while the previous is having surgery, decreasing theatre 'downtime' and maximising theatre utilisation.

[Appendix 5](#) demonstrates how a local anaesthetic hospital-based pathway can be run with senior trainees (ST3-ST7) of 30 minutes case duration. A real-world example case study below and [appendix 7](#) illustrates this pathway in motion. If additional time per case is needed for more junior trainees, this can be amended on the pathway i.e. 45 minutes for ST1-ST2. Patients must be made aware that a trainee may perform the surgery under supervision as part of the consent process.<sup>14,15</sup>

The hospital-based pathway allows advance planning of theatre lists and appropriate time can be set aside for 'training'. It is essential for trainees to participate in cataract assessment clinics. This would allow trainee surgeons to assess and then operate upon the same patient. This continuity of care would allow the trainee to relate to the patient and reduce the anxiety felt by the patient and the trainee (with trainee more mentally prepared for case at hand). The cataract assessment clinics would provide a variety of cataracts that could be selected for a trainee at any level allowing operating lists to be planned safely in advance to ensure adequate time for training.

## 5. Cataract workforce calculator tool

### Introduction

The cataract workforce calculator is an essential tool to support this guidance and a key objective of the project. It enables users to calculate the current and future demand and required multidisciplinary workforce, but particularly the surgical workforce, required to deliver a sustainable cataract service to meet the demand from a defined population. This requires an understanding of the current and likely future demand for cataract surgery to calculate the multidisciplinary staff required for the previously described pathways.

Forecasting the rates of cataract surgery across defined populations is not exact. Differential changes in population size, demographics, and divergence from standard predictions alongside changes in disease incidence and health seeking behaviour can introduce unpredictable variation. Previous modelling studies<sup>23</sup> identified the relevant factors to be population size, age, gender, ethnicity, and disease incidence. We developed a simple user-friendly model with the flexibility to predict workforce requirements for a range of populations and/ or organisations, as well as comparative demonstrations of how different patient pathways influence workforce requirements.

Population Figures	
Current year	2019-20
Population over 50	
Total population (all-ages)	
Population cataract extraction requirement	0
Proportion of local NHS provision	100%
Predicted cataract extraction requirement	0

Please select starting year from the drop down list (default 2019-20)

The model calculates the cataract requirement based upon the size of the Over 50 population.

If the Over 50 population is not known then the size of the general population can be used and the Over 50 population will be estimated based upon UK proportion.

Population data is available on the [Office of National Statistics website \(CLICK HERE\)](#)

[Download Cataract Workforce Calculator >](#)

### Methodology

A review of past modelling studies offered several possible models for consideration. However, to increase accessibility and versatility this workforce prediction has been based upon a linear regression model to predict future demand from hospital episode activity data for cataract extractions (England, Wales and Scotland) and mid-year population estimates for over 50-year-olds between 2009 and 2019.

The model uses standard UK hospital activity data and Office of National Statistics [ONS] population predictions to estimate demand and combines these with the defined healthcare staffing requirements and the patient throughput achieved for each of the described pathways. Future demand has been estimated using ONS mid-year population predictions through to 2029.

The model calculates how many ophthalmic surgeons, nurses, healthcare assistants and primary care optometry teams will be required to deliver a service capable of meeting the predicted and expected demand for surgery for a defined population. This is achieved through the user defined values for the proportion of surgery delivered using each described pathway, then adapting the staff requirement to deliver each pathway. A total workforce requirement is then derived. The model allows for mixed pathways on a proportional basis.

## Benefits and features

- Adaptable to national/ regional / local populations
- Provides information on number of surgical lists, total annual/ weekly ophthalmologist sessions
- Allows comparison between patient pathways to compare throughput and workforce requirements
- 10-year prediction model for future planning
- Can be used to predict workforce requirements or expected/ maximal patient throughput for a specified workforce

## Assumptions and limitations

- Population predictions can be inaccurate
- NHS hospital surgery rates map past changes in incidence
- Cataract demand remains stable
- Unit/ consultant efficiency is constant
- Hospital Staff work for 42 weeks per year (to account for expected annual, professional, and sick leave)
- Univariate model based on population over 50 provides sufficient accuracy
- Constant rate of care provision
- Cannot be used to provide an accurate estimate of incidence

## How to use and interpret the results

The model provides predictions based on any defined population – national, regional, or local. Shaded fields have been used to clearly identify all required user defined data items. The following describes the data needed to populate the model:

**Baseline year:** please select starting year from the drop-down list (default 2018–19)

**Population served:** The model calculates the cataract requirement based upon the size of the over 50 population. If the size of the over 50 population is not known, then the size of the general population can be used and the over 50 population will be estimated based upon UK proportions.

**Cataract pathways:** The model provides for care through all pathways identified in workforce project. The model defaults to 100% of surgery using the standard pathway. This can be amended to replicate current provision and training requirements employing the alternative pathways. Care delivery pathways can also be adjusted to provide comparative levels of workforce requirements.

**Predictions:** The model will provide 10-year predictions for population changes, the associated demand for cataract surgery and workforce requirements. Forecasts for workforce requirements are presented as annual/weekly number of sessions for ophthalmologists and community optometrists, and in annual/ weekly hours for nurses and HCAs, with weekly totals based upon 42 productive working weeks per year.

## Scenarios

### Medium sized district general hospital scenario

To validate historical data and predict current activity and theatre requirements:

We used historical data from a medium sized district general hospital to confirm the validity of the calculator. In this scenario, there is one ophthalmic theatre that is utilised for all sub-specialities so many lists will be a mixture of cases. In 2017, 1,461 cataract operations were performed. This is approximately 35 cases per working week based on 42 working weeks in a year. This correlates well with the calculator's prediction of 5 cataract lists of 7 patients per week to deliver this level of activity. [Table 1]

Table 1

Year	Cataract requirement	Annual Surgical sessions	Primary Care optometrist	Nurse (Hours annually)	Nurse (Hours weekly)	HCA (Hours annually)	HCA (Hours weekly)	Ophthalmologist annual sessions	Ophthalmologist weekly sessions	Ophthalmologist weekly theatre lists
Actual 2017 figures 7 cases/list	1461	209	0	3340	80	1670	40	418	10	5

However, using the latest population figures from the ONS, the catchment population from the local Clinical Commissioning Group [CCG] is 348,000. To achieve a cataract requirement of 1,461 in the calculator for the 2017 figures, we had to use a population of 225,000. This means that this single NHS district general hospital did not provide the cataract surgical service required by its local commissioning Clinical Care Group for its population in that year. This could be for a number of reasons including patients having surgery in adjacent NHS district hospitals or by the private and/or independent sectors providers.

If we use the latest population figure of 348,000, 2,260 cataract operations are required for 2020–21. Using existing pathways, this would require an extra 114 operating lists per year, or 2.5 extra operating lists per week and extra staffing as can be seen in table 2.

The calculator predicts with a high degree of accuracy the number of cataract procedures that the CCG and providers in the local Integrated Care System [ICS] will need to deliver in each future year. This will facilitate prioritisation and forward planning in the delivery of services leading to optimal use of resources. This would be a significant improvement on the current situation in which commissioning decisions are frequently short term and driven by the need to respond to unacceptable waiting times for surgery caused by a lack of capacity to meet demand.

**Table 2**

Year	Cataract requirement	Annual Surgical sessions	Primary Care optometrist	Nurse (Hours annually)	Nurse (Hours weekly)	HCA (Hours annually)	HCA (Hours weekly)	Ophthalmologist annual sessions	Ophthalmologist weekly sessions	Ophthalmologist weekly theatre lists
2020–2021 7 cases/list	2260	323	0	5167	123	2583	62	646	15	7.5

### Medium sized district general hospital scenario

To examine the effect of increasing numbers on operating lists and plan theatre and staffing requirements:

If the number of cases is increased to per list from 7 to either 8 or even 10, the number of operating lists and workforce required reduces significantly.

The theatre sessions reduce from a weekly requirement of 7.5 at 7 cases per list to 6.5 at 8 cases and 5.5 at 10.

**Table 3**

Year	Cataract requirement	Annual Surgical sessions	Primary Care optometrist	Nurse (Hours annually)	Nurse (Hours weekly)	HCA (Hours annually)	HCA (Hours weekly)	Ophthalmologist annual sessions	Ophthalmologist weekly sessions	Ophthalmologist weekly theatre lists
2020–2021 7 cases/list	2260	323	0	5167	123	2583	62	646	15	7.5
2020–2021 8 cases/list	2260	283	0	4521	108	2260	54	565	13	6.5
2020–2021 10 cases/list	2260	226	0	3617	86	1808	43	452	11	5.5

## Medium sized district general hospital scenario

### To predict future theatre and staffing requirements:

The calculator allows prediction of future requirements. The table below shows the additional cataract requirements in 2028–29 as compared with 2020–21.

We have compared the difference between 7 and 8 cases per list and this shows that one extra weekly theatre list would be required under either caseload scenario by 2,028 to supply the increased demand at that time.

These examples use the hospital-based pathway. The calculator allows individual providers of cataract surgery to compare different surgical pathways as well as staffing and skill mix. This information will inform discussions between clinicians and managers on designing and providing services. It will also inform commissioning decisions by CCG's on how best to meet the demand for cataract surgery for its population.

**Table 4**

Year	Cataract requirement	Annual Surgical sessions	Primary Care optometrist	Nurse (Hours annually)	Nurse (Hours weekly)	HCA (Hours annually)	HCA (Hours weekly)	Ophthalmologist annual sessions	Ophthalmologist weekly sessions	Ophthalmologist weekly theatre lists
2020–2021 7 cases/list	2260	323	0	5167	123	2583	62	646	15	7.5
2020–2021 8 cases/list	2260	283	0	4521	108	2260	54	565	13	6.5
2028–2029 7 cases/list	2549	364	0	5826	139	2913	69	728	17	8.5
2028–2029 8 cases/list	2549	319	0	5098	121	2549	61	637	15	7.5

## Scenario for a population of 1,000,000

To examine the effect of increasing numbers on operating lists and plan theatre and staffing requirements:

The table below shows the cataract requirement for a population of 1,000,000 people.

We compare the effect of increasing cases per list from 7 to 8 and 10.

This has the effect of reducing overall annual operating theatre sessions from 928 (7 cases) to 812 (8 cases) and 650 (10 cases).

This translates into a weekly reduction in theatre sessions from 22 to 19.5 (8 cases) or 15.5 (10 cases).

Usually there are 2 theatre sessions in a consultant ophthalmologists job plan. This would require 2 cataract assessment clinics – giving 4 sessions.

From the table below, 11 ophthalmologists would be required to provide cataract services for a million people if there were 7 cases on each operating list, or 10 if 8 cases were performed. However, if 10 cases per list could be achieved, the number of ophthalmic surgeons required would be reduced to 8.

An increase of just one patient per operating list, going from the current average of 7, to 8 cases will require 7,731 less operating lists annually at a national level with a current UK population of 66,650,000. (61,845 to 54,114 operating lists).

Table 5

Year	Cataract requirement	Annual Surgical sessions	Primary Care optometrist	Nurse (Hours annually)	Nurse (Hours weekly)	HCA (Hours annually)	HCA (Hours weekly)	Ophthalmologist annual sessions	Ophthalmologist weekly sessions	Ophthalmologist weekly theatre lists
2020 7 cases/list	6495	928	0	14846	353	7423	177	1856	44	22
2020 8 cases/list	6495	812	0	12991	309	6495	155	1624	39	19.5
2020–2021 10 cases/list	6495	650	0	10392	247	5196	124	1299	31	15.5

## Scenario for a population of 1,000,000

### To Predict Theatre and staffing requirements for the future:

Table 6 below shows the additional demand for cataract surgery in 2028–29 as compared with 2020–21.

Comparison of the difference between 7 and 8 cases per list demonstrates that 2.5-3 extra weekly theatre lists will be required under either caseload scenario to meet the increased demand required by 2028 according to predictions from the calculator tool.

## Scenario for a population of 1,000,000

### To explore the impact of using a community-based pathway:

The hospital based and community-based pathways that we have described are used to calculate staffing levels. Differing proportions of hospital-based and community-based pathways have been shown with the corresponding different results in terms of staffing for the same amount of cataract procedures.

Table 6

Year	Cataract requirement	Annual Surgical sessions	Primary Care optometrist	Nurse (Hours annually)	Nurse (Hours weekly)	HCA (Hours annually)	HCA (Hours weekly)	Ophthalmologist annual sessions	Ophthalmologist weekly sessions	Ophthalmologist weekly theatre lists
2020 7 cases/list	6495	928	0	14846	353	7423	177	1856	44	22
2020 8 cases/list	6495	812	0	12991	309	6495	155	1624	39	19.5
2028–2029 7 cases/list	7324	1046	0	16742	399	8371	199	2093	50	25
2028–2029 8 cases/list	7324	916	0	14649	349	7324	174	1831	44	22

Table 7 below compares the following scenarios against an 8 patient hospital-based pathway.

- 75% hospital based & 25% community-based
- 50% hospital based & 50% community-based
- 25% hospital based & 75% community-based

**Table 7**

Year	Cataract requirement	Annual Surgical sessions	Primary Care optometrist	Nurse (Hours annually)	Nurse (Hours weekly)	HCA (Hours annually)	HCA (Hours weekly)	Ophthalmologist annual sessions	Ophthalmologist weekly sessions	Ophthalmologist weekly theatre lists
2020 8 cases/list Hospital based	6495	812	0	12991	309	6495	155	1624	39	19.5
2020–2021 25% community	6495	880	0	11434	272	5497	131	1539	37	18.5
2020–2021 50% community	6495	947	474	9472	226	4263	101	1421	34	17
2020–2021 75% community	6495	1015	761	7104	169	2791	66	1269	30	15

## Real world examples of pathways and theatre lists

The tables below show the timings of theatre lists on two consecutive weeks.

- Operating is due to start at 13:30 for 4 hours until 17:30
- All patients had attended a cataract assessment clinic prior to surgery and complex cases identified
- An ST6 registrar also participated in both the assessment and theatre lists.
- All cases were under topical anaesthesia unless stated otherwise
- The 'time taken' column is the time for the patient to arrive in the anaesthetic room from being sent for from the daycase unit, which in this unit is on a different floor
- The 'into theatre' column is the time the patient entered the operating theatre prior to the patient being positioned and having their surgery
- The 'out of theatre' column is the time the patient left the theatre following surgery
- As can be seen, there is a mixture of case complexity and the registrar performed half of the cases both weeks
- Interestingly, the reception staff improved upon the time taken to bring the patient to theatre by an average of five minutes over the two-week period. They felt more comfortable with the system in the second week
- The average time in theatre was very similar on both occasions
- Reflections of the cataract assessment clinic and theatre sessions by an ST6 trainee are shown in [Appendix 7](#). It was felt 'this new set up allows better rapport between the trainee and patient and increases the efficiency of the list, allowing more time for training. These are the benefits to me as the trainee but of course, there are other benefits to the patient and to the hospital.'

**Table 8**

### Week one

Patient	Sent for	Time taken	Anaesthetic Room	Into theatre	Out of theatre	Theatre time	Surgeon grade	Complexity
1	13:24	9	13:33	13:34	13:50	16	Cons	
2	13:36	14	13:50	13:52	14:21	29	Spr	
3	14:03	7	14:10	14:21	14:35	14	Cons	
4	14:22	18	14:40	14:42	15:06	24	Spr	
5	14:51	11	15:00	15:06	15:20	14	Cons	
6	15:16	18	15:34	15:35	15:57	22	Spr	
7	15:38	12	15:50	15:58	16:20	22	Cons	Dense, vision blue used
8	16:05	10	16:15	16:24	16:42	18	Spr	
	<b>Mean</b>	<b>12.3</b>			<b>Mean</b>	<b>19.9</b>		

Table 9

## Week two

Patient	Sent for	Time taken	Anaesthetic Room	Into theatre	Out of theatre	Theatre time	Surgeon grade	Complexity
1	13:28	6	13:34	13:39	13:55	19	Cons	Small pupil
2	13:40	7	13:47	13:58	14:30	32	Cons	Sub-tenon, post ACG, malugan ring used
3	14:05	6	14:11	14:34	14:50	16	Spr	
4	14:36	10	14:46	15:00	15:15	15	Spr	Dense, vision blue used
5	15:03	8	15:11	15:20	15:40	20	Cons	
6	15:29	8	15:37	15:40	16:00	20	Spr	
7	15:46	8	15:54	16:02	16:25	23	Cons	
8	16:10	8	16:18	16:25	16:42	20	Spr	Dense, vision blue used
	<b>Mean</b>	<b>7.62</b>				<b>Mean</b>	<b>20.62</b>	

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## 7. Acknowledgements

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## Conflicts of interest

The individuals involved in the development and formal peer review of this guidance were asked to complete a conflict of interest declaration. It is noted that declaring a conflict of interest does not imply that the individual has been influenced by his or her interest. It is intended to ensure interests (financial or otherwise) are transparent and to allow others to have knowledge of the interest. No conflicts of interest were declared by the group.

# Appendix 1: Shared decision-making tool cataract surgery

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## What is a cataract?

A cataract is a clouding, or opacity, of the lens inside the eye. Cataracts usually form slowly over a period of years, causing a gradual blurring of vision which eventually may not be correctable with glasses. In some people the vision can deteriorate quickly.

Developing cataracts can also cause glare, difficulty with night-time driving and multiple images in one eye, which can affect the quality of your vision.

## There are two main options for managing cataracts:

1. Using aids and adaptations to help you manage your vision
2. An operation to remove the cataract

## Vision aids and adaptations

Vision aids, such as glasses and magnifiers, help you see better for specific tasks such as reading.

Adaptations are changes you are able to make to equipment or the environment that help you adjust reduction in vision caused by cataracts, such as increasing the font size of text on screens, improving room lighting or using large print books.

These aids and adaptations do not treat the cataract but can help you adjust your lifestyle to deal with the impact on your sight. Your GP or optometrist can refer you to a low vision service who would be able to give you advice about aids and adaptations.

## Cataract surgery

Cataract surgery is an operation to remove the cataract. The operation involves removing the cloudy lens and replacing it with a clear artificial lens.

In most cases surgery is very successful and most people who have a cataract operation can see better afterwards.

As with any operation, there are small risks. About 10% of people have some complication during or after cataract surgery and around 0.1% of people have worse vision afterwards.

## Coronavirus Disease 2019

SARS-CoV-2 (COVID-19) is an important issue to consider when choosing whether to have cataract surgery or not. Opting to have an operation will involve at least one to two visits to the hospital, and to your optometrist, before, during and after surgery. Your individual risk profile for COVID-19 will be discussed at the time of deciding to have surgery and at pre-assessment. You may be asked to take a swab test for COVID-19. It may take a few days for a swab result to return. This is to protect the safety of you, other members of the public and staff. However, it is not possible to guarantee a zero risk of catching COVID-19 during any of your visits. You need to discuss and balance the theoretical small risk of contracting Covid-19 with the real risks to you of not treating the cataract. This may include issues such as reduced quality of life or inability to drive due to poor vision and varies with each individual.

## How is your cataract affecting you?

---

*Put a cross next to all items that apply to you*

Because of your eyesight, have you had a problem with your ability to work?

Because of your eyesight, have you had a problem with driving?

Because of your eyesight, have you had a problem with your ability to undertake leisure activities such as reading, watching television or recognising faces?

Because of your eyesight have you had a problem with your mobility or do you feel that you are at risk of falls?

Because of your eyesight, are there other problems you are experiencing?  
Please add details below:

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Are you willing to explore using aids and adaptations to see better?

Are you willing to wait and see what happens to your vision?

Are you willing to have surgery that may make your vision worse or have side-effects?

Do you understand that there is a very small risk of COVID-19 if you attend for assessments and surgery for cataract?

Do you understand that delaying your operation until after the Covid pandemic is a reasonable alternative?

## Appendix 2: Local anaesthetic coronavirus cataract proforma

Patient Label				Right / Left Phacoemulsification & IOL				LA	GA		
Surgeon											
TCI =				1 <sup>st</sup>		2nd					
IOL Power		Right =		Left =							
IOL Ordered				Yes		No					
Age =	Male / Female		Axial length >26mm	1.5	Axial Length <22mm		2				
Age 70-90		1.5	Glaucoma	1.5	Abnormal Cornea		2				
Age > 90		2.5	Absent Fundal View	1.5	Shallow AC		2				
Diabetic	Yes	No	Diabetic Retinopathy	1.5	PXF		3				
Poor Mobility / Positioning /unable to lie flat		1.5	Small Pupil	1.5	Only Eye		3				
Claustrophobia/Anxiety		2	Alpha Blocker	1.5	Mature / Brunescant		3				
Hard of hearing/limited English		2	Previous Trabeculectomy	1.5	Posterior polar		3				
Tremor		2	Previous Vitrectomy	2	PC rupture to other eye		3				
CL Wearer	Corneal laser										
VRE	Positive	Negative	<b>Total: Trainee &lt;3, Fellow, 3-6, Consultant only &gt;6</b>								
MRSA	Positive	Negative	Consent	Biometry							
Latex Allergy	Yes	No	Explained to patient – may require glasses post-operatively								
Drug Allergies	No	COMMENTS									
Warfarin	INR on Op day	Aspirin		Sub Tenon	Vision Blue	Healon GV	Iris hooks				
Pre/Post-op Advice	COVID Swab	Dentures	Recent falls	<b>G. Proxymetacaine (as PGD)</b>		Both Eyes					
Medical History	MI	CVA	Other	<b>G Iodine 5% (as PGD)</b>		Left	Right				
ICD					Date	Time	Given By	Sign			
BP	Temp	Pulse	BM								
Carer and transport Details											
1 SLOT (10 MINS)		2 SLOTS (20 MINS)		3 SLOTS (30 MINS)		1 SLOT (10 MINS)		2 SLOTS (20 MINS)		3 SLOTS (30 MINS)	
Assessing Nurse			Date		Name of Listing Dr / Nurse			Date			

## Appendix 3: Preoperative eye drops instructions for patients

---

Dear .....

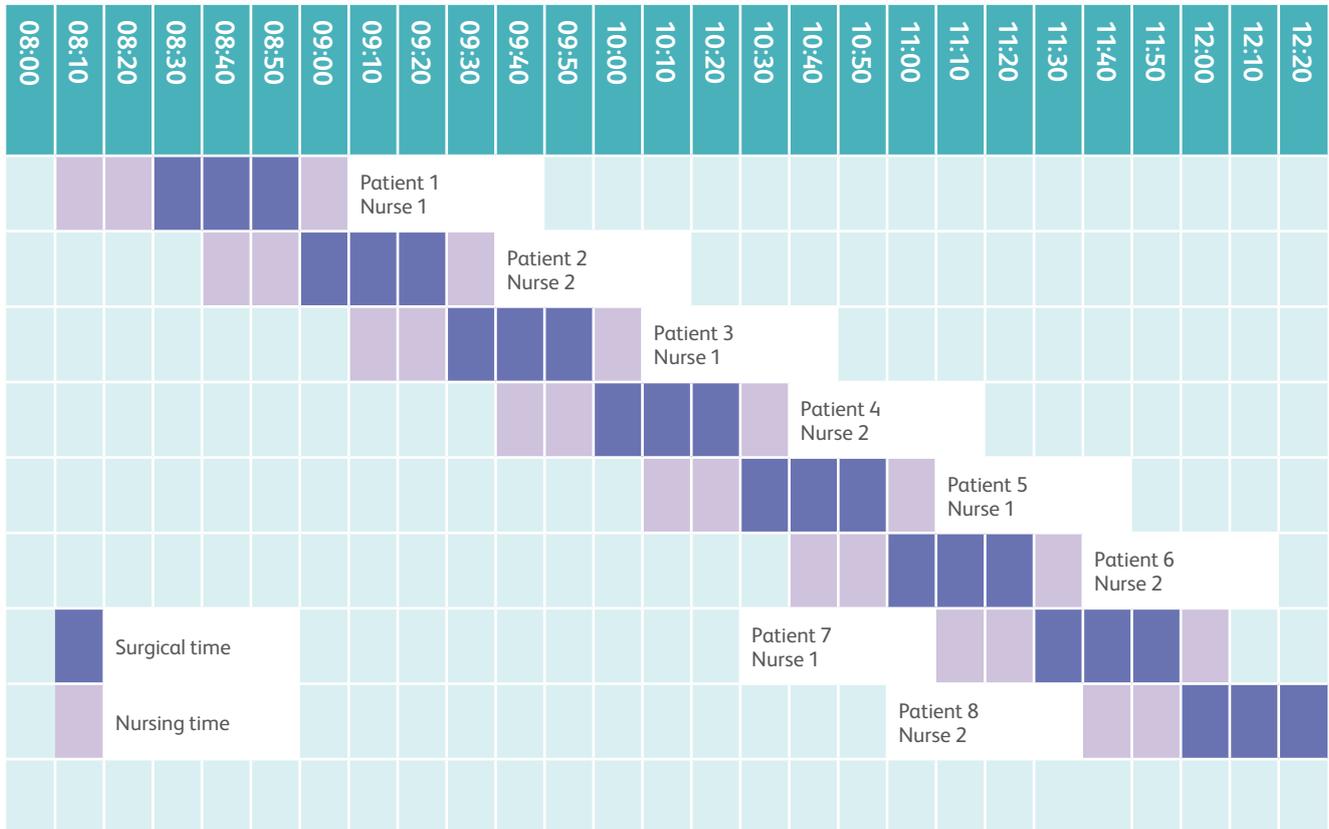
Please attend for your ..... eye cataract surgery at ..... on  
.....

In preparation for your cataract surgery please put at least 2 of the  
provided drops into your ..... eye at..... on.....

It does not matter if more drops go into your eye.

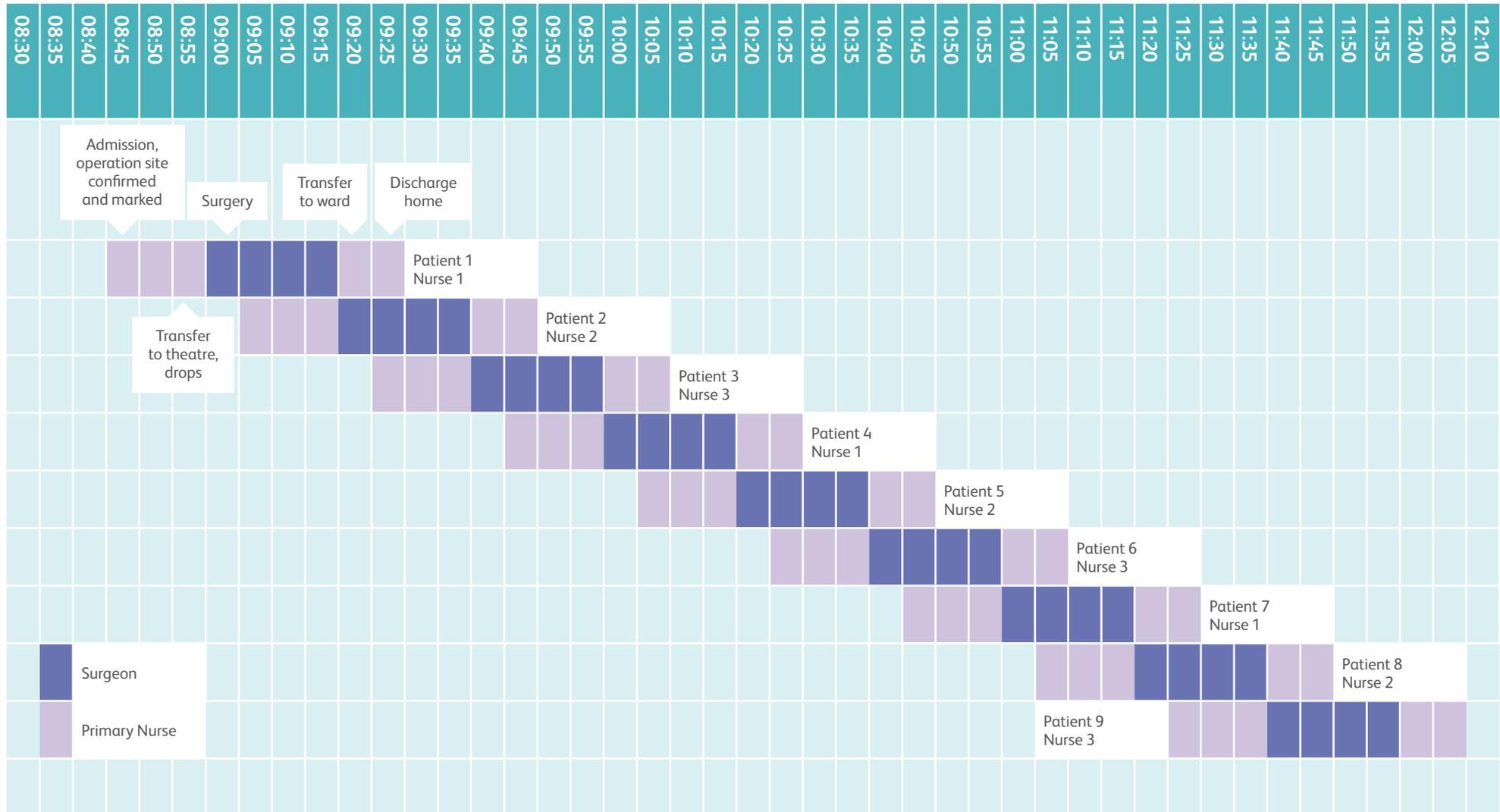
# Appendix 4: Local anaesthetic cataract theatre timeline

## 30 minutes surgical time



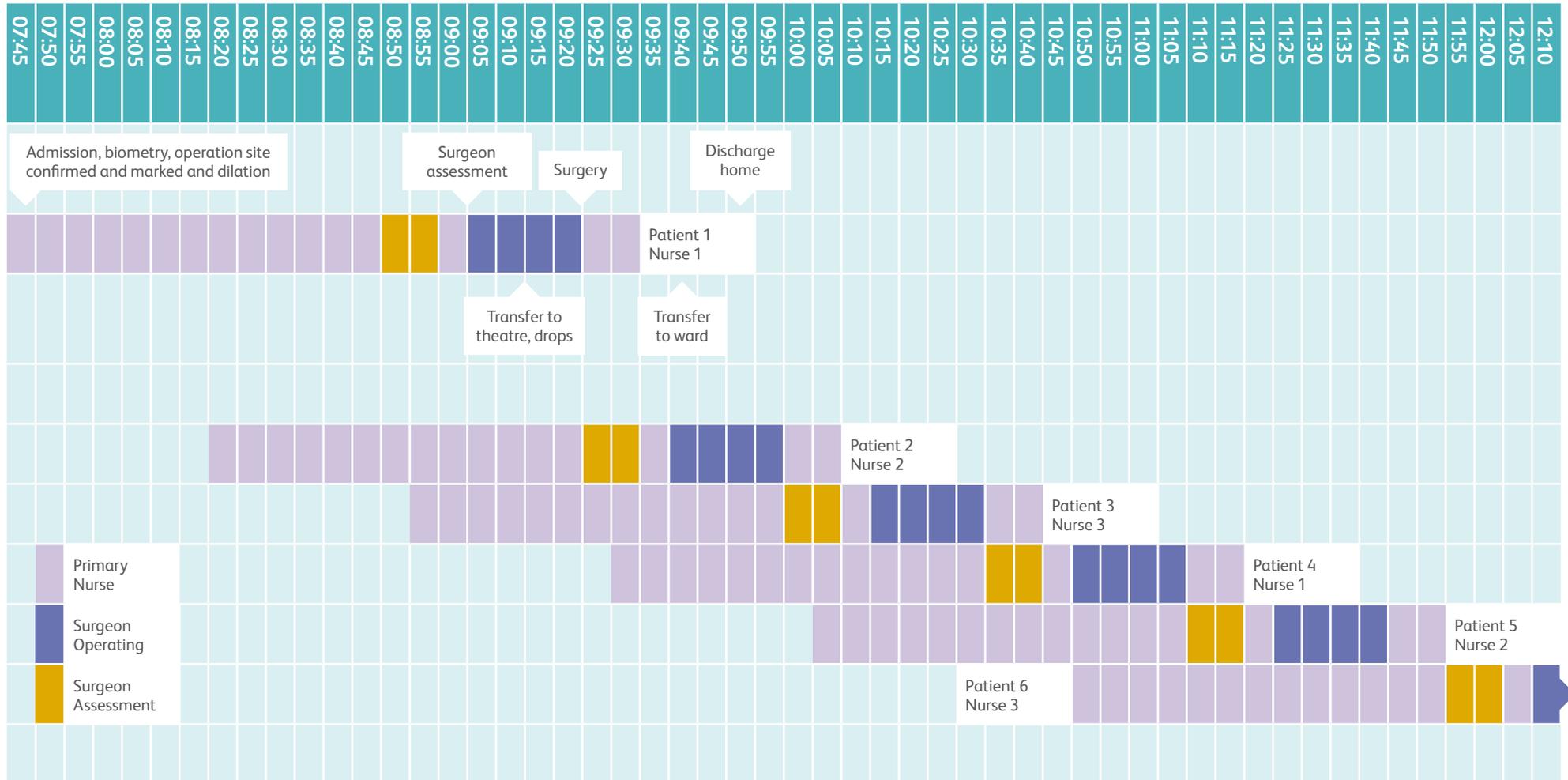
# Appendix 4: Local anaesthetic cataract theatre timeline

## 20 minutes surgical time



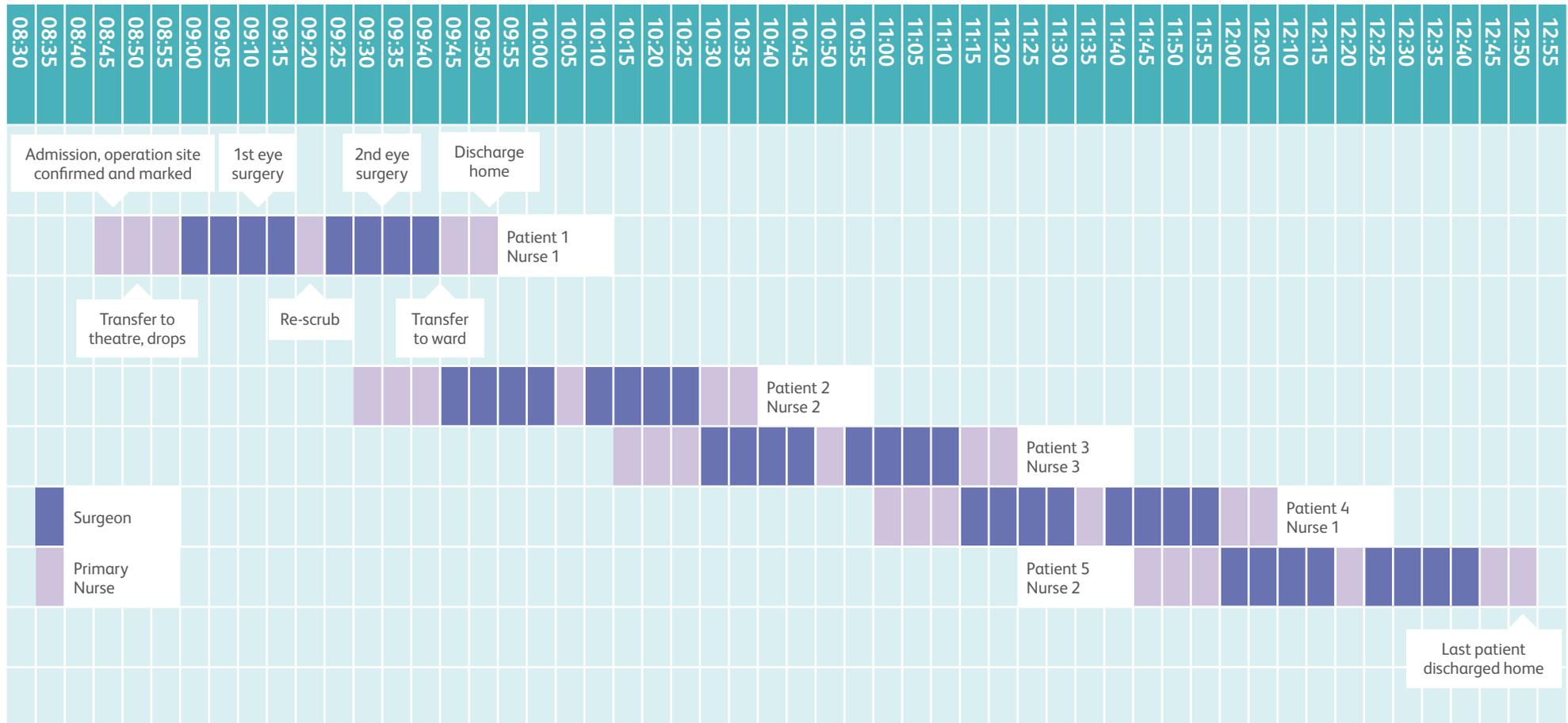
# Appendix 5: Community based cataract theatre timeline

## 6 eyes, 6 patients



# Appendix 6: Hospital based sequential bilateral cataract surgery theatre timeline

## 20 minutes surgical time



## Appendix 7: A trainee's perspective on cataract clinic and theatre

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I am an Ophthalmology trainee ST6 in a hospital which runs a one stop cataract clinic, in which the patient has biometry and assessment by the operating consultant surgeon followed by surgery on an agreed date usually within 2-3 weeks. I undertake this clinic and list under the supervision of the consultant.

As a trainee, it can sometimes be difficult operating on a patient that you have never met before, either in clinic or during the pre-operative assessment. This often happens as trainees rotate regularly so patients you see and list often have surgery after you have moved to the next phase of your training. This frequently limits the rapport that can be developed between the trainee and the patient.

However, the short surgical pathway in my current hospital means that you meet the patient at the pre-operative assessment and the patient has surgery within 2 – 3weeks. This means a rapport between the trainee and patient can be built prior to the day of surgery increasing confidence while reducing anxiety for both patient and trainee.

Furthermore, as you have met the patient recently and have created your own management plan for the operation so the day of surgery becomes much more efficient. Rather than needing to do a full pre-operative assessment on the day you meet the patient again in the anaesthetic room for the usual WHO checks. This means there is more time for operating. This maximises the time available to the trainee to operate under supervision.

The current arrangement I have with the supervising consultant is that we operate on alternate cases. The consultant operates while I perform the first stages of the WHO checklist with the next patient in the anaesthetic room and then scrub for that case. This increases the efficiency and number of cases on the list. I think this works well as I am able to operate independently as an ST6. However, even for a more junior trainee that needs more supervision, because the pathway is much more efficient, it still allows more surgical time for training junior trainees while still allowing them to meet the patient beforehand.

In summary, I think this new surgical pathway where I currently work allows better rapport between the trainee and patient and also increases the efficiency of the list, allowing more time for training. There are the benefits to me as the trainee but of course, there are other benefits to the patient and to the hospital.

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