

# High Volume Cataract Surgery

Review of models and recommendations for NSW Health

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## AGENCY FOR CLINICAL INNOVATION

Level 4, 67 Albert Avenue  
Chatswood NSW 2067

PO Box 699 Chatswood NSW 2057  
T +61 2 9464 4666 | F +61 2 9464 4728  
E [aci-info@nsw.gov.au](mailto:aci-info@nsw.gov.au) | [www.aci.health.nsw.gov.au](http://www.aci.health.nsw.gov.au)

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The Ophthalmology Network Governing Body

Crystal Burgess, Surgical Services Taskforce Manager, Agency for Clinical Innovation

Ellen Rawstron, Clinical Associate Director Surgery, Anaesthesia and Interventional Medicine

Trish Wilson, Surgical Access Network Manager, HNE LHD

Belinda Ford, Community Eye Care Coordinator, WS LHD

## Glossary

AIN	Assistant in Nursing
CSSD	Central Sterilising Services Department
DS	Day Surgery
HCA	Health Care Assistant
LEAN	Lean thinking is a business methodology that aims to provide a new way to think about how to organise activities to deliver more benefits and value while eliminating waste
ODP	Operating Department Practitioners are a part of the multidisciplinary operating theatre team, providing patient-focused care during anaesthesia, surgery and recovery. This is a defined role in the UK with ODPs working across the perioperative area, however in Australia the equivalent is an Anaesthesia Technician in qualification.
OT	Operating Theatre
SME	Subject Matter Expert
VMO	Visiting Medical Officer

## Executive summary

In August 2018 the NSW Minister for Health & Minister for Medical Research held the *Increasing Access to Cataract Surgery* forum. This half day workshop brought together expert clinicians, health service managers and executives to identify the challenges, successful models and to design recommendations to increase access to cataract surgery in NSW.

The Agency for Clinical Innovation Ophthalmology Network had three specific actions from this forum:

1. Provide a summary report on existing business rules including recommendations specific to ophthalmology with consideration of the NSW Health Outpatients Framework.
2. Consult with stakeholders and develop a draft document (in regards to a standardised outpatient referral form) NOTE: This has since been refined to a cataract outpatient referral form.
3. Define the high volume surgery model for cataract surgery, with potential to use Kurri Kurri as an example.

This report provides a summary of the known high volume day surgery models for cataract surgery, both internationally and domestically, together with a list of factors that can be seen as enablers for high volume cataract surgery.

It is also clear in researching these models that there is no one single model of high volume day surgery model for cataract surgery that could be used across NSW due to variation in medical workforce payment structures, hospital role delineation and staff mix. The enablers identified have been shown in literature and in practice to improve patient throughput both within existing resources and those that would require additional funding in staff or equipment.

Enablers for high volume cataract surgery are:

1. Dedicated cataract theatre lists
2. Sufficient equipment to complete a list without delays in the central sterilising unit
3. Lists to be run with dedicated nursing staff
4. Consultant led lists
5. Patients are assessed suitable for local anaesthetic (no general anaesthetic)
6. Lists to be all one side if possible (i.e. all right lens insertion or all left).
7. Grading of the cataract in conjunction with estimated theatre time required could help maximise available session time.

Additional findings

1. Lists that were led by Visiting Medical Officer (VMO) staffing had a higher throughput than lists that were staff specialist led.

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## Introduction

In August 2018 the NSW Minister for Health & Minister for Medical Research held the *Increasing Access to Cataract Surgery* forum. This half day workshop brought together expert clinicians, health service managers and executives to identify the challenges, successful models and to design recommendations to increase access to cataract surgery in NSW.

The Agency for Clinical Innovation Ophthalmology Network had three specific actions from this forum:

1. Provide a summary report on existing business rules including recommendations specific to ophthalmology with consideration of the NSW Health Outpatients Framework.
2. Consult with stakeholders and develop a draft document. (In regards to a standardised outpatient referral form, later specified as for cataracts only)
3. Define the high volume surgery model for cataract surgery, with potential to use Kurri Kurri as an example.

This report provides a summary of the known high volume day surgery models for cataract surgery, both internationally and domestically, together with a list of factors from the models that can be seen as enablers for high volume cataract surgery.

## Method

- A literature search was conducted using the following search terms:
  - “High volume cataract surgery”
  - “High volume surgery”
  - “Cataract surgery theatre models”.
- Follow up with Subject Matter Experts (SME) within NSW on specific models of care.

## Results

### UK model

In 2015 the Royal College of Ophthalmologists released a report providing a summary of factors that could increase the number of cataract surgeries being performed. The report focused on the entire patient process from referral to post-operative care and employed a LEAN methodology to remove steps that were not a value add in the patient journey.

The report suggests a target of one cataract surgery per 30 minutes.

Several factors were highlighted as important in maximising the amount of surgery performed:

- Staffing levels and skill mix in day case area and theatre
- Geography of the day surgery waiting department in relation to theatres
- Staff attitude

- Patients on high volume lists excluded those who needed a general anaesthetic.

In regards to staff mix the addition of one Health Care Assistant (HCA) to assist in room turn over and assist in patient preparation resulted in an additional three cataract surgeries being performed in a 10 hour list.

### High volume cataract list staffing proposal (Operating Theatre only)

Theatre	Surgeon	Operating Department Practitioner (ODP)	Scout Nurse	Scrub Nurse	Health Care Assistant	Number of procedures in 4 hour list.
1	1	1	1	2	0	7
1	1	1	1	2	1	10

### Application for the NSW context

- Examine the role of the HCA for application in the NSW public hospital context and investigate costing of a dedicated HCA to assist cataract list turn over.
- Consider dedicated staff to high volume cataract theatre lists.
- Explore options of co-locating day surgery and eye theatre in new builds.
- The role of the ODPs is not used in NSW. The equivalent qualification in NSW is an Anaesthetic technician.

### India Model

This model provided evidence that the availability of additional instrument sets in conjunction with staff attitude and skill mix were the key factors in increasing cataract surgery throughput.

“Smarter working” was also identified in this model in terms of preparing a patient for surgery. For example, routine roles that had previously been undertaken by Ophthalmologists could be undertaken by suitably trained allied health staff. Roles included A Scans, field analysis and measures.

### High volume cataract list staffing proposal (Operating Theatre only)



Theatre	Surgeon	Scrub nurse	Scout nurse	Instrument sets	Number of cataracts per hour
1	1	1	1	1	1-2
1	1	1	1	3	3

### Application for the NSW context

- Available instrumentation is a crucial enabler to maximise the flow of surgery.
- In regards to outpatient clinic practice, investigate the practicality and legality of additional training for allied health staff and nurses to conduct testing and measures for patients. This could reduce waiting time to cataract surgery if access to Ophthalmologists is an identified issue for a clinic.

### Belgium Model

This research study identified a number of factors that can negatively influence the number of cataracts that can be performed on a list. This demonstrates the need for clear criteria to be established and used to ensure that only patients who meet this criteria are added to a high volume cataract list.

Examples of these patient factors are the severity of the cataract and patient's choice or clinical need for a general anaesthesia. Correct identification of these patients and allocation to non-high volume lists can assist flow.

Factors that can increase the number of cataracts that can be performed on a list were identified as:

- Experience: Surgeon > 15year plus versus under 5 years.
- Experience of scrub team
- Volume on list
- Design of Operating Theatre (OT) to minimise enter and exit times – for example co-location day surgery ward/recovery space
- Analgesia choice on preparation and exit time.

It also demonstrated that the number of procedures that a surgeon did annually did not affect the numbers on a list.

### **Application for the NSW context**

- Patient selection is important to high volume lists including patient and anaesthetist preference on anaesthetic used and the severity of cataract. Criteria for high volume lists should be agreed locally and established.
- High volume cataract lists should have a dedicated scrub team to minimise turn over time.
- Dedicated high volume cataract lists should be consultant led and not used for teaching opportunities.

### **Hong Kong model**

A review of cataract surgery in Hong Kong demonstrated several factors that could be used within NSW to increase throughput utilising existing capacity.

These included:

- Co-location of eye OT and day surgery waiting area to reduce transport time.
- Redesigning instrument sets so they are in a ready to use layout.
- Consumables in custom packs and laid out ready to use
- Dedicated eye theatres with set up and SSD staff deliver pre-packed instruments trays to theatre by “auto refill” to save nursing staff having to find the equipment on shelves.
- Prompt removal of used instruments to encourage instrument flow.
- Electronic patient monitoring and medical records.
- Dedicated theatre staff led to increased team work and pride in team.

The implementation of above reduced turnaround time from eight (8) minutes to 2.7 minutes and an increase to 10 surgeries in a day session (length of day was not detailed) which equated to the addition of two whole day sessions per week within the current OT allocation.

### **Application for the NSW context**

- Examine current instrument tray layouts to ensure core instrumentation is included and is in useability order where possible. Custom packs, where used, should be reviewed for content and ease of use.
- Where possible, have dedicated staff for high volume cataract lists.
- In new builds, consider co-locating day surgery with eye theatre. In existing builds, review if theatre most commonly used for eyes could be closer to day surgery unit.

### **Finland Model**

In this model an Optometrist is employed by the hospital, who, with the support of nurses completes an examination including the grading of the cataract.

The hospital uses a categorisation system (A,B,C,D) to assign the amount of surgical time/support a patient would need in theatre.

Category	Category description	Estimated time per eye
A	Routine patient	20 minutes
B	Complex	30-40 minutes
C	More complex	40-60 minutes
D	Most complex with General Anaesthetic	Not specified

There are approximately 6-8 patients seen per list (AM and PM), per theatre. This number depends on the case mix assigned using the category system.

As the Ophthalmologist does not see the patient prior to the day of surgery, there is a space with slit lamps set up outside the theatre suite so the patient can have a brief examination with the Ophthalmologist prior to the operation.

Meanwhile, three theatre nurses prepare the room, chair, and equipment. Lenses are stored outside of the theatre rooms in the centralised location and are collected after the Ophthalmologist has examined the patient. This centralised area also has a computer station, and each of the theatre rooms has two-way cupboard which can be accessed/restocked from inside and outside the theatre.

In the theatre the patient is prepped by one nurse, a second nurse is the scrub and the third nurse is stationed at the theatre room computer to make notes about the operation. A single one-page template is used to record notes for both the outpatient appointment and surgery. These templates use checkboxes to record information for routine cases, and space to allow clinicians to add in additional details for cases outside of the norm.

If there is a same-day cancellation, the clinic team will try to immediately fill the theatre space with an eligible patient from the outpatient department.

### **Application for the NSW context**

- Optometrists do not routinely work in outpatient clinics in NSW however the equivalent is performed by Orthoptists, Ophthalmic nurses and Ophthalmologists. Although out of scope for this report, this difference in service provider would not affect the throughput in theatre.
- A three nurse configuration is common practice in NSW with an anaesthetic, scrub and scout nurse.
- Consideration should be given to a theatre list being run concurrently with a cataract clinic to address any day of surgery cancellations would need to consider workforce availability.

- Grading of the cataract in conjunction with estimated theatre time required could help maximise available session time.

### **NSW hospital time and motion study**

To identify current use of time within operating theatres for cataract surgery a time and motion study was performed at one NSW site. This study, although not specific for a high volume cataract service, identified where time could be saved that could be applicable to developing a high volume cataract surgery model.

This study showed potential enablers for a higher throughput of cases to be:

- Concurrent anaesthetic activity.
- A review of patients by the surgeon or nominee who are added to the list to identify potential complications and challenges.
- An increase in the number of trays reduce delays at CSSD in instrument turn over.
- Schedule same side cataracts on list (i.e. all left or all right) where possible.
- Patients to enter the OT before the scrub nurse is scrubbed.
- Roster staff so as list can start on time. This equated to one extra patient being able to be added per all day list.
- Staff review – if a consultant/senior registrar list add more patients on to the list.

### **Application for NSW context for a high volume model**

- Provides further evidence of criteria for patients suitable for a high volume model.
- Supports high volume lists to be run by a consultant or senior registrar.
- Ensure equipment and instrumentation is available for the list to be completed without delays due to the sterilising process.

### **Kurri Kurri Hospital**

At the forum the Kurri Kurri Hospital model for cataract surgery was suggested as a potential model that could be replicated in other areas of NSW.

Kurri Kurri Hospital has a throughput of 10-15 cataract procedures in an all-day session. Although their model has not been formally evaluated, the key parts of their model are supported in evidence as being enablers for high volume cataract surgery. These include:

- Specialised nursing staff
- Consultant led lists – these lists are VMO led
- Adequate equipment to complete list without sterilising delays.

The lists are not dedicated cataract lists however the hospital is for elective procedures only and as such do not have emergency surgery interrupting lists.

### **Application for NSW context for a high volume model**

- This model supports the literature of dedicated nursing staff to reduce turn over time between cases.
- The funding models for medical staff should be further investigated to determine if a VMO model leads to a higher throughput of cases than a staff specialist or senior registrar led list.

## **Discussion**

### **Opportunity for smaller sites to assist larger sites in their LHDs**

The focus on dedicated staff, regional anaesthetic and day surgery, together with a focus on uncomplicated cataract surgery, makes this model very suitable for smaller sites with a lower role delineation. These sites could play a central role in meeting the need for patients requiring cataract procedures in the LHD through a pooled cataract list of suitable patients.

## **Summary of considerations for a high volume cataract surgery model**

When exploring options for introducing a high volume cataract surgery model there are multiple factors that need to be considered. From the literature and examples detailed, a creation of a model may need additional staffing and equipment support, changes in rostering and scheduling of cases to accommodate the extra throughput in the perioperative space and recovery units.

Below is a list of enablers as derived from the findings of this report that sites should consider in introducing a high volume cataract surgery model.

### **Staffing**

- Dedicated ophthalmic scrub/scout staffing with a focus on team building.
- Consideration of a dedicated porter/Health Care Assistant to the cataract theatre.
- Consultant led lists – further investigation is required as to whether a VMO list has a higher throughput than a staff specialist/senior registrar list.
- Consideration to rostering requirements so the theatre is ready to start on time.
- Local workforce review is needed to establish if a theatre list can be ran concurrently with a cataract clinic (if available) to address any day of surgery cancellations.

### **Equipment**

- Sufficient trays to complete list without cases being delayed due to the sterilising process.
- Trays to be ordered for ease of use (for example set up to go).

### **Patient selection**

- Patients for high volume lists should be suitable for a regional anaesthetic.

- The patient's cataract should be adequately assessed as an "uncomplicated cataract" by the admitting Ophthalmologist.
- An agreed grading of the cataract in conjunction with estimated theatre time required could help maximise available session time. There are several grading systems currently used by Ophthalmology however no formal agreement as to length of case.

## References

De Regge, M., Gemmel, P., Duyck, P. and Claerhout, I. (2016). A multilevel analysis of factors influencing the flow efficiency of the cataract surgery process in hospitals. [online] Onlinelibrary.wiley.com. Available at: <https://onlinelibrary.wiley.com/doi/pdf/10.1111/aos.12819>

Judson, K. and Courtright, P. (2017). Impact of systematic capacity building on cataract surgical service development in 25 hospitals. [online] Available at: <https://bmcophthalmol.biomedcentral.com/articles/10.1186/s12886-017-0492-5>

Ministry of Health and Long-Term Care (2018). Quality-Based Procedures Clinical Handbook for Cataract Day Surgery, Ontario. [online] Health.gov.on.ca. Available at: [http://www.health.gov.on.ca/en/pro/programs/ecfa/docs/qbp\\_cataract.pdf](http://www.health.gov.on.ca/en/pro/programs/ecfa/docs/qbp_cataract.pdf)

Rcophth.ac.uk. (2016). The Way Forward: Options to help meet demand for the current and future care of patients with eye disease. [online] Available at: <https://www.rcophth.ac.uk/wp-content/uploads/2015/10/RCOphth-The-Way-Forward-Cataract-300117.pdf>

Thulasiraj, R., Priya, R. and Saravanan, S. (1997). High Volume, High Quality Cataract Surgery. Indian Journal of Community Health. [online] V2020eresource.org. Available at: [http://v2020eresource.org/content/files/hightvol\\_catsurg.pdf](http://v2020eresource.org/content/files/hightvol_catsurg.pdf)

To, K. (n.d.). Re-engineering & Instrument Sets modification had increased cataract surgery throughput (conference presentation). [online] Www3.ha.org.hk. Available at: <http://www3.ha.org.hk/haconvention/hac2010/proceedings/pdf/Service/spp7-6-to.pdf>

Van Vliet, E., Bredenhoff, E., Sermeus, W., Kop, L., Sol, J. and Van Harten, W. (2011). Exploring the relation between process design and efficiency in high-volume cataract pathways from a lean thinking perspective. [online] Available at: <https://academic.oup.com/intqhc/article/23/1/83/1798599>