

# Comparing “fly in-fly out” with retrieval-based Ophthalmology care at Royal Darwin Hospital: costs and outcomes of treatment



Sunset from Darwin Sailing Club

**Peter McCluskey AO**  
MBBS, MD, DSc, FRANZCO, FRACS

**Save Sight Institute**  
**Faculty of Medicine & Health**



**Sydney Eye Hospital**  
**Royal Prince Alfred Hospital**  
**St Vincent's Hospital**

**Tas RANZCO & IAPB**  
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# FIFO Vs retrieval ophthalmology VR surgical care

## Financial Disclosures

I have the following financial interests or relationships to disclose

Investigator in the following clinical trials:

- ADVISE
- Clarity
- SANDCAT
- Rosah

None are relevant to this study

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## Authors:

This was a complex study that required a large team effort:

- Data collection and analysis
  - Danny Lam
  - Madelaine Moore
- Health economic cost analysis
  - Michelle Cunich
- Ophthalmologists
  - Stewart Lake
  - I-Van Ho
  - Peter McCluskey
  - Tharmalingam Mahendrarajah



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### Comparison of a visiting subspecialist ophthalmology service to Royal Darwin Hospital with interstate transfers: costs and clinical outcomes of treatment

Danny Lam<sup>A,B,C</sup> (MBBS, Ophthalmology Registrar), Madelaine Moore<sup>B</sup> (MOrthoptics, Orthoptist), Michelle Cunich<sup>D,E</sup> (PhD, Senior Research Fellow), Stewart Lake<sup>B,F</sup> (FRANZCO, Consultant Ophthalmologist and Vitreoretinal Surgeon), I-Van Ho<sup>A,B,C</sup> (FRANZCO, Consultant Ophthalmologist and Vitreoretinal Surgeon), Peter McCluskey<sup>A,B,C,\*</sup> (FRANZCO, Professor of Ophthalmology) and Tharmalingam Mahendrarajah<sup>B</sup> (FRANZCO, Consultant Ophthalmologist)

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All authors had input & reviewed the study publication

This study was performed at Royal Darwin Hospital

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## Background:

- management of vision threatening eye disease improved remarkably this century => highly trained sub-specialist Ophthalmology care
- access challenging for rural & remote communities
- 2010, Ophthalmology at RDH began to develop a sophisticated tertiary model of eye care for eye patients
- RDH very supportive by supplying equipment, infrastructure & funding
- 11 regular 'fly in-fly out' (FIFO) consultant ophthalmologists
- diabetes is a huge problem esp in ATSI population
- late presentations with advanced disease common

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## Ophthalmic Sub-specialties:

- Medical retina
- Vitreo-retinal surgery
- Glaucoma
- Cornea & external eye disease
- Uveitis
- Neuro-ophthalmology
- Paediatric Ophthalmology
- Oculo-plastic surgery

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## Aim:

- VR surgical patients arguably the most expensive group
- compare the costs and clinical outcomes of treating patients with retinal diseases requiring surgery
  - managed locally in Darwin through a visiting (FIFO) subspecialist ophthalmology service
  - transferred to interstate tertiary eye centres

## Methods:

- retrospective case series
- 2018 – 2019 (pre-Covid)
- 2 visiting VR surgeons
- each made 4 visits over 2 years

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## Vitreo-Retinal Surgery:

### Local Pathway:

- advanced diabetic eye disease
- mac-off detachments +/- tractional RD
- macular hole
- epiretinal membrane
- dropped nucleus/subluxed lens

### Retrieval Pathway:

- mac-on detachments
- endophthalmitis

### Either Pathway:

- vitreous haemorrhage

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## Methods:

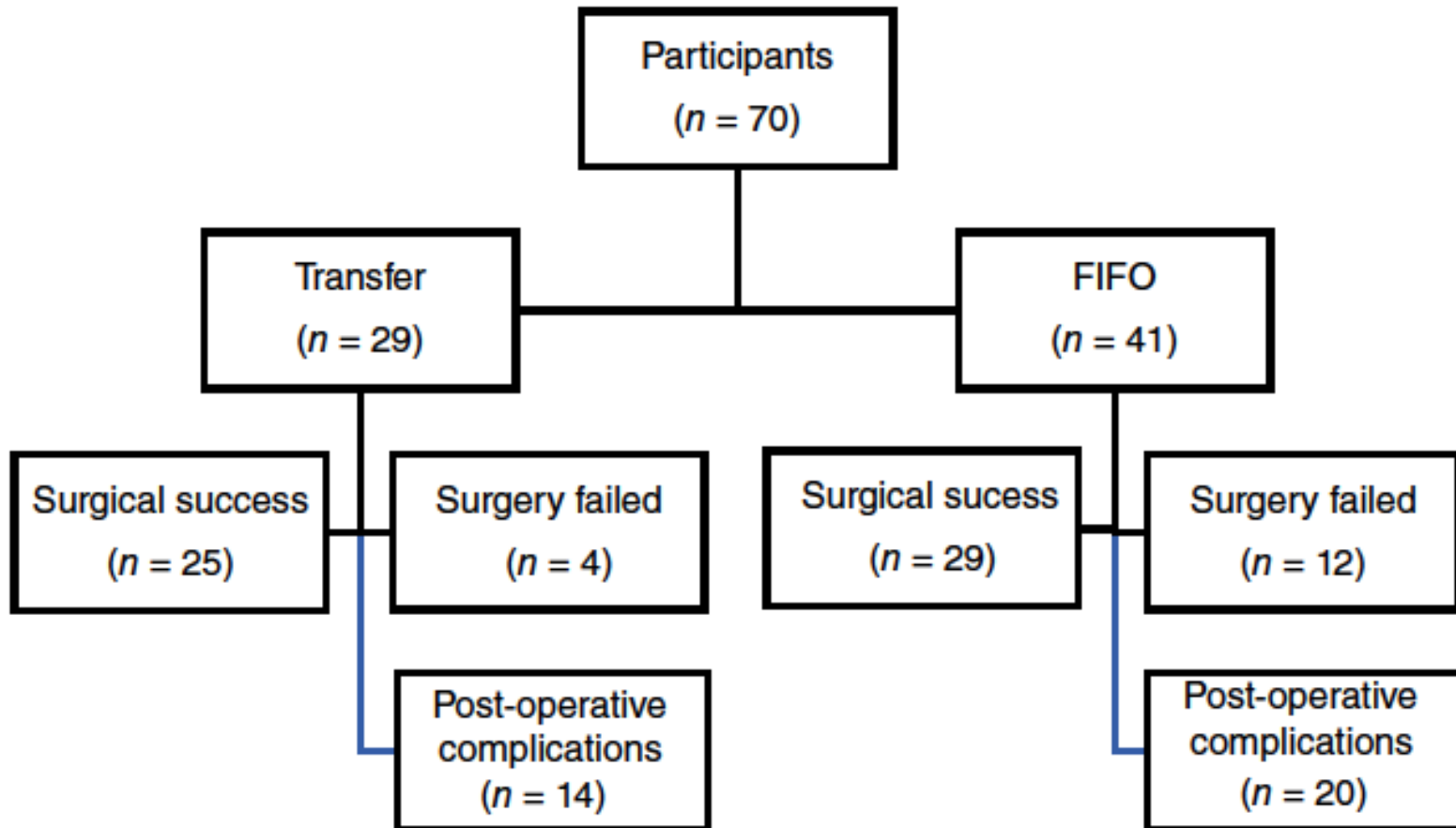
### Outcome data

- validated template (Japan RD registry)
- BCVA, IOP at 1, 3, 6 months
- failure was need for further surgery
- complications

### Health Economic Data

- Expenditure
  - DRG, URG, Tier 2 non-admitted costs
  - Averaged via National Benchmarking Portal
- Travel costs
  - NT Health PATS
  - FIFO submitted costs

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**Table 1.** Characteristics of the study groups.

Demographic	FIFO ( <i>n</i> = 41)	Transfer ( <i>n</i> = 29)
Age (years)		
<40	4 (10)	6 (21)
40–60	14 (34)	11 (38)
>60	23 (56)	12 (41)
Gender		
Male	24 (59)	21 (72)
Female	17 (41)	8 (28)
Aboriginal or Torres Strait Islander		
Yes	17 (41)	6 (21)
No	24 (59)	23 (79)



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**Table 2.** Visual outcomes.

Outcome	FIFO (n = 41)	Transfer (n = 29)	P-value
Pre-op BCVA, mean ± s.d.	1.52 ± 0.88	1.67 ± 0.86	0.5032
Post-op BCVA 1 month	1.35 ± 0.82	0.98 ± 0.70	0.0745
Post-op BCVA 3 months	1.14 ± 0.84	0.88 ± 0.75	0.2598
<b>Post-op BCVA 6 months</b>	<b>1.27 ± 0.85</b>	<b>0.76 ± 0.75</b>	<b>0.0488</b>
Pre-op IOP, mean ± s.d.	12.31 ± 4.55	12.46 ± 6.64	0.9923
Post-op IOP 1 month	15.94 ± 10.87	17.12 ± 7.58	0.6401
Post-op IOP 3 months	15.21 ± 9.46	14.61 ± 5.41	0.7883
Post-op IOP 6 months	16.50 ± 11.56	13.44 ± 3.61	0.3211
<b>Time of diagnosis to surgery (mean days ± s.d.)</b>	<b>79.98 ± 75.09</b>	<b>14.48 ± 28.85</b>	<b>&lt;0.0001</b>
Failure of initial surgery, n (%)			0.1574
Y	12 (29)	4 (14)	
N	29 (71)	25 (86)	
Additional procedures, n (%)			0.0888
Y	16 (39)	18 (62)	
N	25 (61)	11 (38)	
Outpatient follow up episodes	10.78 ± 10.01	9.93 ± 8.58	0.7121



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**Table 3.** Complications and additional procedures.

Complications, <i>n</i> (%)	FIFO ( <i>n</i> = 41)	Transfer ( <i>n</i> = 29)
Re-detachment	4 (10)	3 (10)
Cataract	3 (7)	1 (3)
Raised IOP	2 (5)	8 (28)
Repeat vitreous haemorrhage	2 (5)	0
Post-operative cystoid macular oedema	1 (2)	0
Ongoing full thickness macular hole	3 (7)	0
Other	5 (12)	2 (7)
Additional procedures, <i>n</i> (%)	FIFO ( <i>n</i> = 16/ 41, 39%)	Transfer ( <i>n</i> = 18/ 29, 62%)
Repeat vitrectomy ± oil	3 (7)	1 (3)
Removal of oil (silicone/densiron)	3 (7)	9 (31)
Cataract surgery	3 (7)	1 (3)
Transfer for surgery interstate	2 (5)	0
Multiple procedures	2 (5)	7 (24)
Other	3 (7)	0

Other complications include: neovascular glaucoma, post-operative cystic macula oedema, silicone oil in the anterior chamber, inflammatory scleritis and retinal neovascularisation.

Other additional procedures include: cyclocryotherapy, suture removal and sutured secondary intra-ocular lens.

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**Table 4.** Average costs and expenditures.

<b>Expenditure cost items (A\$), mean ± s.d.</b>	<b>FIFO (n = 41)</b>	<b>Transfer (n = 29)</b>	<b>P-value</b>
<b>Interstate travel costs</b>	<b>597.66 ± 237.58</b>	<b>1862.41 ± 1224.92</b>	<b>&lt;0.0001</b>
<b>OPD diagnosis to surgery<sup>A</sup></b>	<b>1222.50 ± 1759.66</b>	<b>259.40 ± 737.11</b>	<b>0.0071</b>
ED diagnosis to surgery	478.67 ± 21.36	0	NA
Cost of surgery	5040.73 ± 640.49	4768.52 ± 381.94	0.449
OPD follow-up	4296.68 ± 3951.92	3585.09 ± 3236.51	0.4275
ED follow-up	937.83 ± 451.79	1204.83 ± 1197.78	0.3929
Admission follow-up	7172.11 ± 4686.49	7081.43 ± 3434.20	0.9906
Average total cost	19,746.18	18,761.68	



**cost difference \$984.50 (< 5%)**

**more than offset by 291 MR OPD consultations  
across the 8 FIFO visits**

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## Discussion:

- first in Australia
- excellent visual outcomes with similar costs for both care pathways, comparable to previous reports on similar populations
- only differences in cost between the FIFO and transfer groups
  - costs of interstate travel
  - outpatient costs from diagnosis to surgery
- 291 medical retina outpatients managed locally at RDH Eye Clinic by the visiting specialist across eight visits.

(in addition to the 41 patients that had surgery in the FIFO group)

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## The key messages:

- a sustainable financial model for providing local high acuity eye care for blinding eye disease
- results are broadly applicable to those in other rural and remote health services.

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**Thank You**



**Approaching storm during the wet**