The Australian Corneal Graft Registry 2018 Annual Report

Presented by Miriam Keane, PhD
ACGR Executive Director
At the Australia and New Zealand Cornea Society Meeting
March 7th 2019
Major events

- 2018 ACGR Report released July 2018
  - USB posted to contributors with individual feedback
  - Available freely online: http://hdl.handle.net/2328/37917
- Collaboration on eye module of the Electronic Donor Record
  - No changes to information provided by surgeons
  - All registration forms to be returned to Eye Banks
- Qualified Privilege Attained
  - Suggested at ANZCSM in 2015 and granted on December 12th 2018
  - Greater level of protection for recipients, donors, surgeons and eye banks
  - Identified data cannot be released without written permission from identified parties, or Ministerial permission
Qualified Privilege

- We can still
  - Work with eye banks to identify missing graft registrations
  - Request follow-up on identified patients via mail and phone
  - Provide an identified list of recipients for which follow-up is still sought
  - Produce reports based on amalgamated data
  - Provide individual feedback to surgeons and eye banks for personal audit
  - Link with the National Death Index

- We cannot
  - Provide individual feedback that may enable inadvertent identification of individual surgeons, eye banks or recipients by any other entity
  - Any external attempt to do so will be a breach of the Act
The ACGR Database – 15th February 2019

<table>
<thead>
<tr>
<th></th>
<th>Registered</th>
<th>Followed</th>
<th>Failed</th>
<th>EGF*</th>
<th>PNF*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td>37014</td>
<td>76%</td>
<td>21%</td>
<td>3%</td>
<td>2%</td>
</tr>
<tr>
<td><strong>PK</strong></td>
<td>25777 (70%)</td>
<td>82%</td>
<td>23%</td>
<td>2%</td>
<td>&lt;1%</td>
</tr>
<tr>
<td><strong>Other lamellar</strong></td>
<td>1578 (4%)</td>
<td>74%</td>
<td>20%</td>
<td>7%</td>
<td>1%</td>
</tr>
<tr>
<td><strong>Limbal</strong></td>
<td>86 (&lt;1%)</td>
<td>73%</td>
<td>35%</td>
<td>6%</td>
<td>1%</td>
</tr>
<tr>
<td><strong>DALK</strong></td>
<td>1728 (5%)</td>
<td>58%</td>
<td>7%</td>
<td>2%</td>
<td>&lt;1%</td>
</tr>
<tr>
<td><strong>DS(A)EK</strong></td>
<td>5797 (16%)</td>
<td>68%</td>
<td>18%</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td><strong>DMEK</strong></td>
<td>2048 (6%)</td>
<td>47%</td>
<td>18%</td>
<td>12%</td>
<td>10%</td>
</tr>
</tbody>
</table>

*EGF = Early graft failure, failed within 3 months of graft
PNF = Primary non-functioning graft, surgeon specified that graft never cleared/attached
Registered Graft Numbers

*As received by 15th February 2019

70% first grafts
30% repeat grafts
First Grafts – Fuchs’ Endothelial Dystrophy

*As received by 15th February 2019
First Grafts - Keratoconus

- Reduced numbers overall in latest years
- Decrease in both PK and DALK

*As received by 15th February 2019

- Decrease in recipients aged <30
- Increase in mean age from 33 to 35 (2004 to 2015) to 37/38 in 2017/2018
Corneal Grafts in Eyes with a History of CCXL

- 57 first grafts for keratoconus
  - Earliest reported in 2012
  - 31 PK, 25 DALK, 1 limbal
  - 1 patient with bilateral first DALK
  - Median age: 29 years, range 16 to 60
    - Median age no CCXL, from 2012: 32 years, range 10 to 94, n=1983
  - 25/57 (44%) followed – median: 2y5m, range: 5m to 5y3m
    - 1 failure to date (rejection @ 5m)
- 12 other indications for first graft
  - pellucid marginal degeneration (3); infections (2 bacterial, 1 fungal); ectasia following LASIK (3); keratoglobus (1); corneal scarring (1); pseudophakic bullous keratopathy (1)
DMEK results update

- At the census date for the 2018 Report (31 July 2017)
  - 1250 registered, 600 followed
- Now 2048 registered, 966 followed

*As received by 15th February 2019*
New, stronger multivariate model derived

- Chi²= 162.72, p<0.0001, n=2048
- Pre-cut cornea by eye bank no longer retained
- 4 new variables now included in model
  - Storage medium and length of storage, p=0.004
  - Donor/recipient sex match/mismatch, p=0.009
  - Graft size, p<0.001
  - Surgeon volume and level of follow-up, p<0.001
- Influence of graft year has changed
In multivariate model $p<0.001$

Best survival was for DMEK which were 8.5 mm to 8.75 mm (orange line)

DMEK that were 8.75 mm or more (yellow line) did not have significantly worse survival than other groups

Worst survival was for DMEK which were <8.0 mm (blue line)
DMEK - Surgeon volume and follow-up

- High volume surgeon cut off is 2% registered DMEK = 41 grafts
- Average follow-up: 47%
  - High follow-up had 78%
- In multivariate model p<0.001
  - High volume surgeons with high follow-up (green line) had significantly better survival than the other two groups
  - No significant difference in survival between low volume surgeons (blue line) and high volume surgeons with low follow-up red line)
DMEK - Graft Year

- In multivariate model $p=0.002$
  - No difference in graft survival for three earliest eras (blue, red, and green lines)
  - Superior survival for DMEK performed in 2015/2016 (orange line)
  - Don’t yet know about 2017/2018 (yellow line) due to follow-up lag time

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![Kaplan-Meier survival curve](image.png)
DMEK – Summary of New Findings

- No significant difference in DMEK survival for corneas pre-cut by eye bank
- Differences across storage practices
- Effect of sex mismatch: female to male have poorest graft survival
- Graft survival improved in 2015/16 compared to earlier cohorts
- Small grafts <8.0 mm do worst, 8.5 mm to 8.75 mm do best
- Differences between high volume and low volume surgeons are confounded by rates of follow-up provided
Acknowledgments

- DonateLife – The Australian Government Organ and Tissue Authority
- Contributing surgeons, eye banks and follow-up practitioners

- Our team
  - Miriam Keane – Executive Director
  - Nora Coffey – Project Officer
  - Vicky Jones – Administrative Officer
  - Keryn Williams – Scientific Director
  - Richard Mills – Medical Director

Australian Corneal Graft Registry
Phone: 08 8204 5321
Email: miriam.keane@flinders.edu.au