



The Australian Corneal Graft Registry

2020 Annual Report

Overview

- ▶ **2020 - Achievements of the ACGR**
- ▶ **Overview of the ACGR database**
- ▶ **Impact of COVID on corneal grafting in Australia**
- ▶ **2021 ACGR Major Report preview**
 - ▶ **Focus on keratoconus**

2020 - Achievements of the ACGR

- ▶ 2019 report presented in New Zealand in February 2020
- ▶ COVID working arrangements from March to June 2020
 - ▶ Administrative staff stayed on-site
 - ▶ Research staff worked from home
 - ▶ Full functionality maintained throughout
- ▶ Individual feedback provided to high volume surgeons
- ▶ Preparation for next major report
 - ▶ Follow-up request August/September
 - ▶ Data entry major push
 - ▶ Data cleaning of ACGR database
- ▶ Funding renewed for July 2020 to June 2022 period
- ▶ Ethics clearance renewed to December 2023

Overview of the ACGR database

- ▶ **40,864 Registered grafts**
- ▶ **31,460 Followed grafts**

- ▶ **Database for 2021 Major Report**
 - ▶ **Grafts performed up to 31st December 2020**
 - ▶ Registrations form received by 31st March 2021
 - ▶ **All follow-up received by 31st December 2020**
 - ▶ Primary Non-Function notified as regrafted by 31st March 2021

Types of Grafts Registered with the Australian Corneal Graft Registry

- ▶ Penetrating Keratoplasty (PK)
- ▶ Deep Anterior Lamellar Keratoplasty (DALK)
- ▶ Descemet's Stripping Endothelial Keratoplasty (DS(A)EK)
 - ▶ Manual (DSEK) or automated dissection (DSAEK)
- ▶ Descemet's Membrane Endothelial Keratoplasty (DMEK)
- ▶ Traditional/Tectonic Anterior Lamellar Keratoplasty (TLK)
 - ▶ Includes peripheral patch grafts
- ▶ Limbal Stem Cell Grafts

Overview of the ACGR database

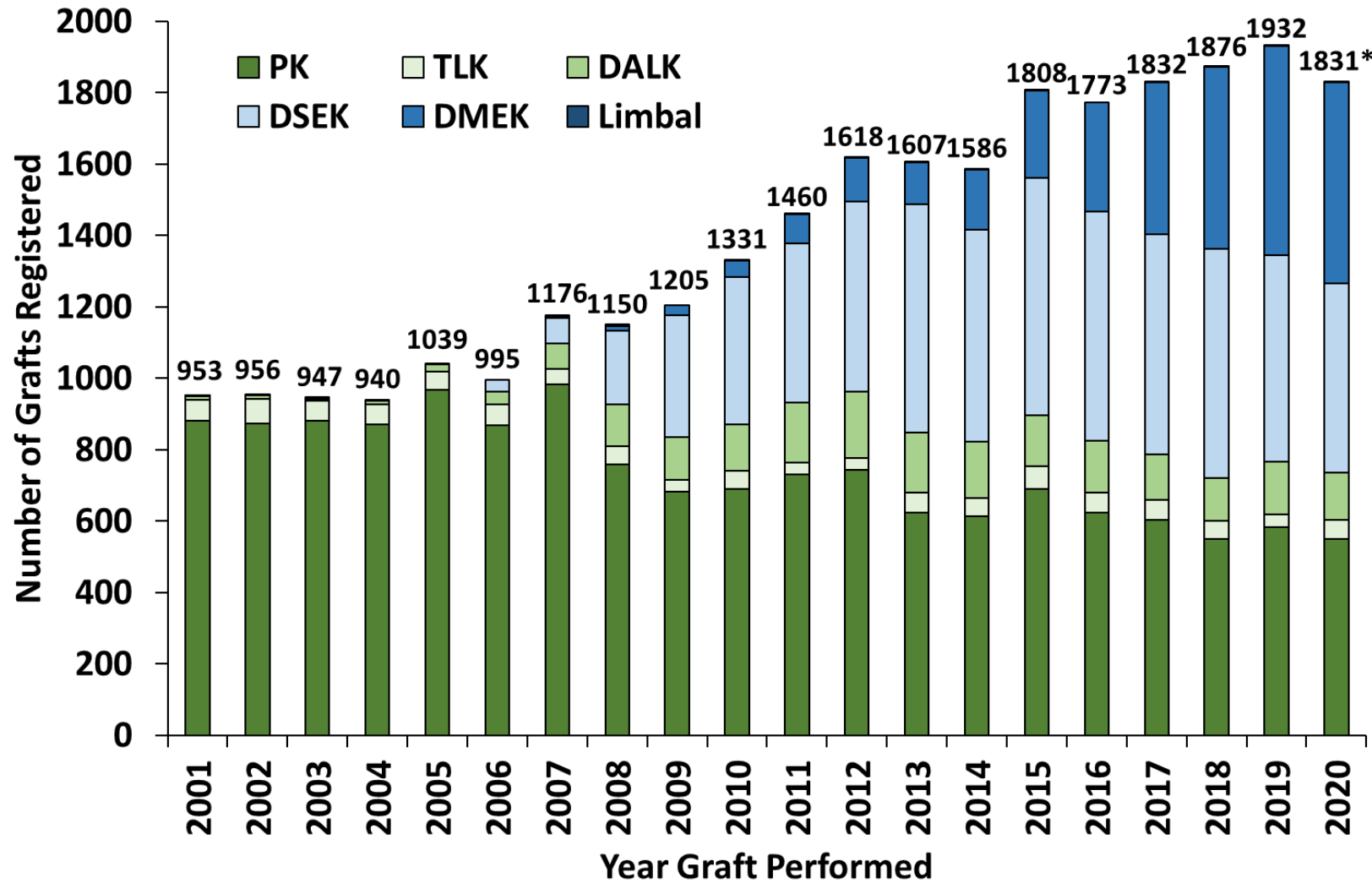
► Database as at 31st March 2021

	PK	DS(A)EK	DMEK	DALK	TLK	Limbal	Total
Registered	26924	6947	3215	2018	1670	90	40864
Followed	82%	73%	55%	61%	75%	73%	77%
Failed	25%	21%	18%	8%	21%	34%	23%
Lost to follow-up	34%	17%	10%	38%	38%	34%	30%
Died with surviving graft	19%	6%	1%	1%	20%	13%	14%
Active*	22%	56%	71%	53%	21%	18%	33%

Penetrating Keratoplasty (PK), Descemet's Stripping (Automated) Endothelial Keratoplasty (DS(A)EK), Descemet's Membrane Endothelial Keratoplasty (DMEK), Deep Anterior Lamellar Keratoplasty (DALK), Traditional Lamellar Keratoplasty (TLK).

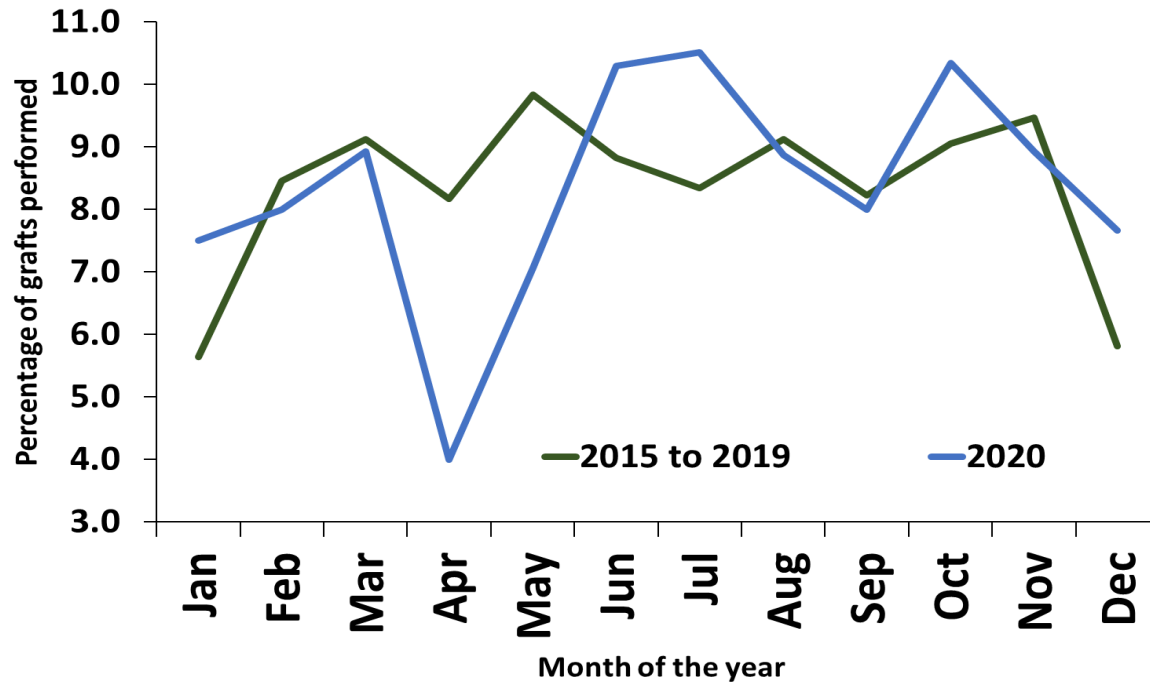
*Active grafts are still having follow-up sought by the ACGR. They are not known to have failed, have not been lost to follow-up, and the recipient is not known to have died with a surviving graft.

Registered Grafts by Graft Type and Year



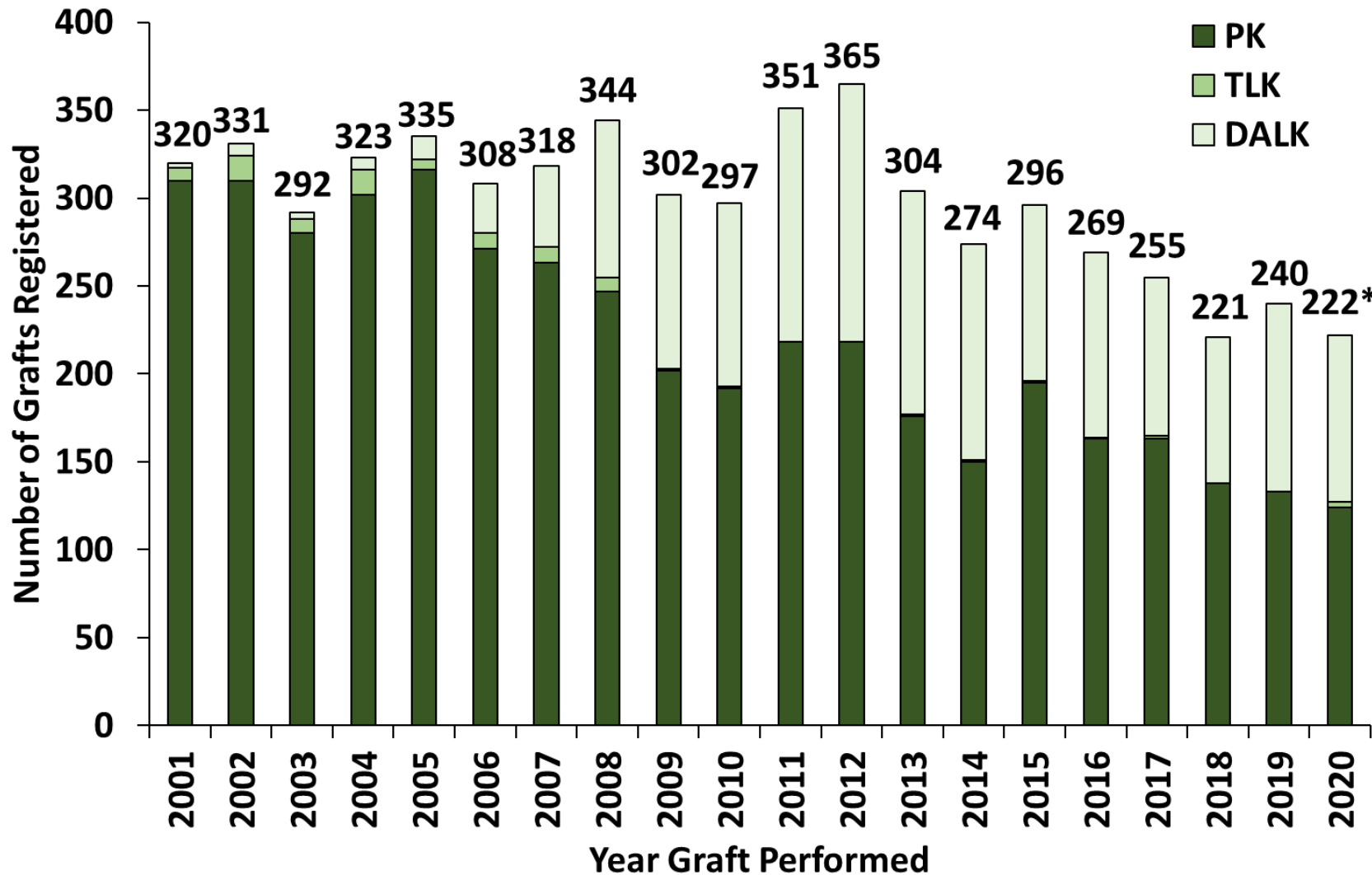
* The number of grafts registered in 2020 is expected to increase slightly as some registrations may not have been received by the census date of March 31st 2021.

Impact of COVID19 on Corneal Graft Numbers



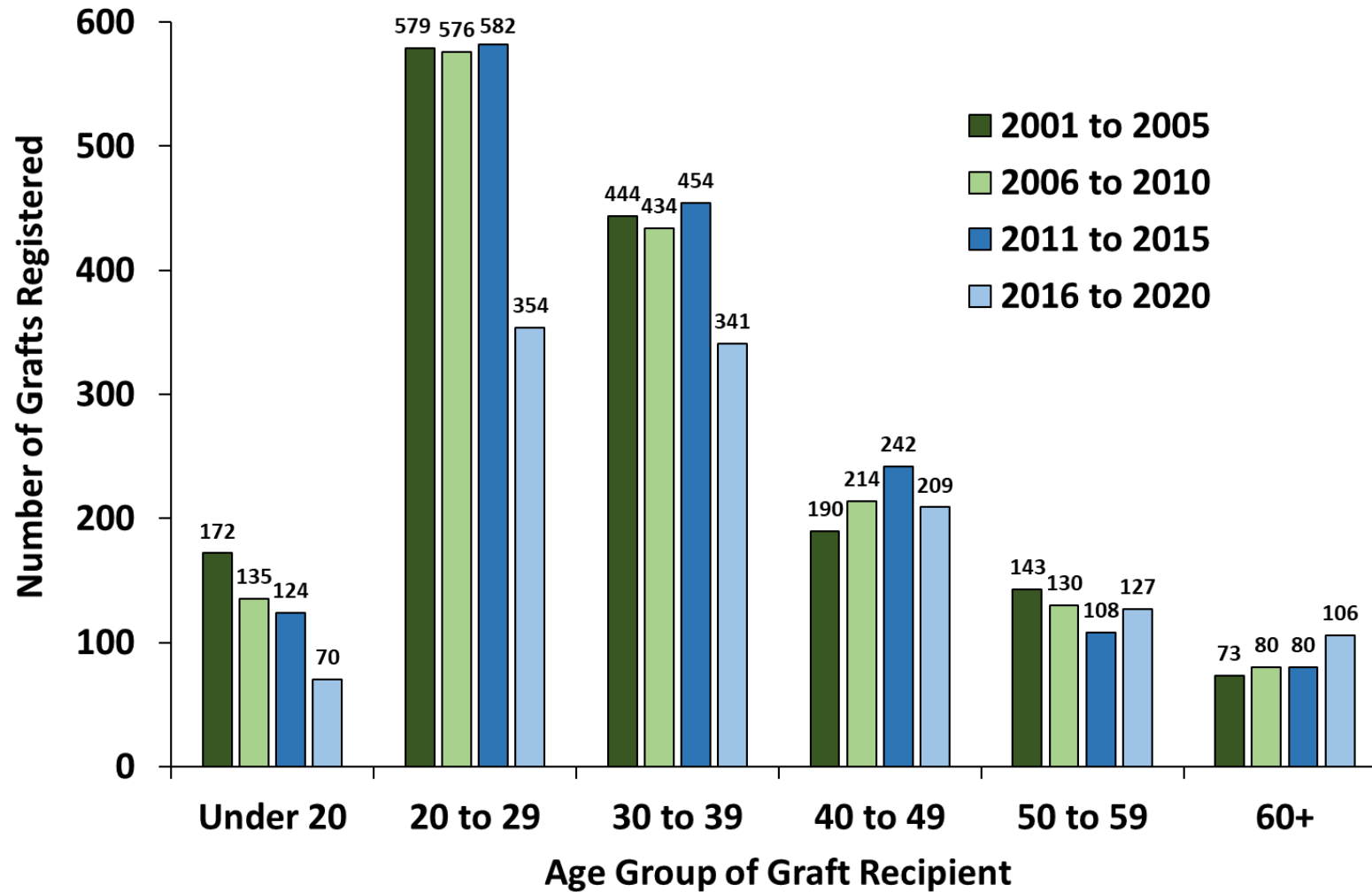
- ▶ Normal variation over year 2015 to 2019
 - ▶ Dips tend to coincide with school holidays
- ▶ Dip in April 2020 at onset of national lockdowns
- ▶ Increased rates in June to October to reduce backlog
- ▶ Dip in August/September during Victorian lockdown

Grafts performed for Keratoconus



* The number of grafts registered in 2020 is expected to increase slightly as some registrations may not have been received by the census date of March 31st 2021.

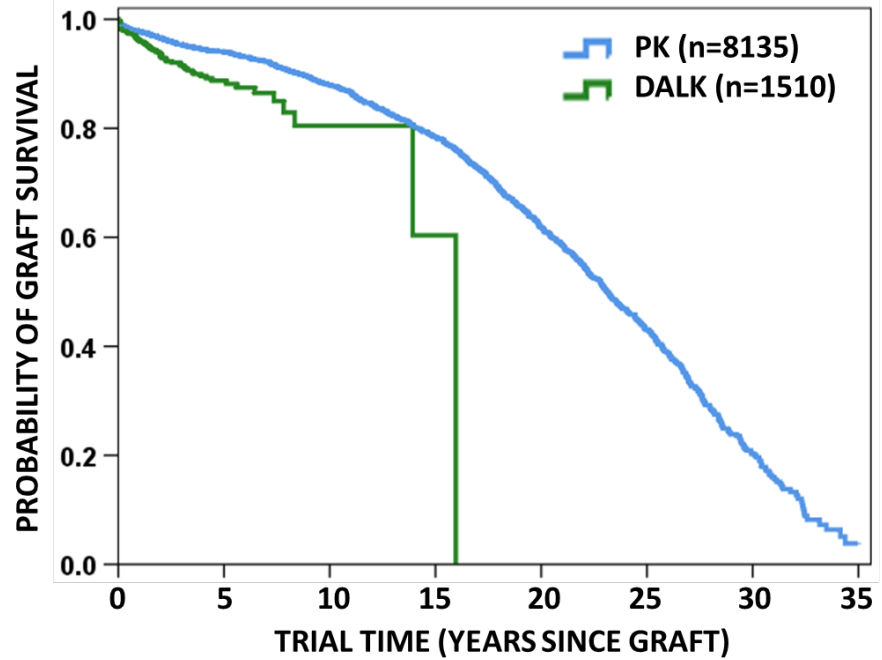
Age at First Graft for Keratoconus



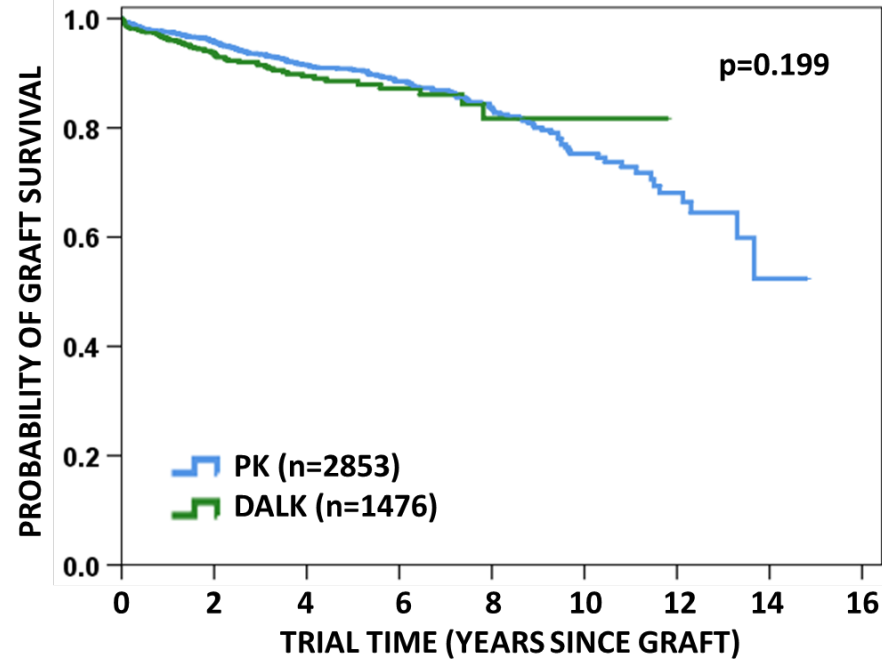
- ▶ Reduced numbers in younger age groups in last five years

Survival for Keratoconus by Graft Type

All grafts



Grafts 2006-2020

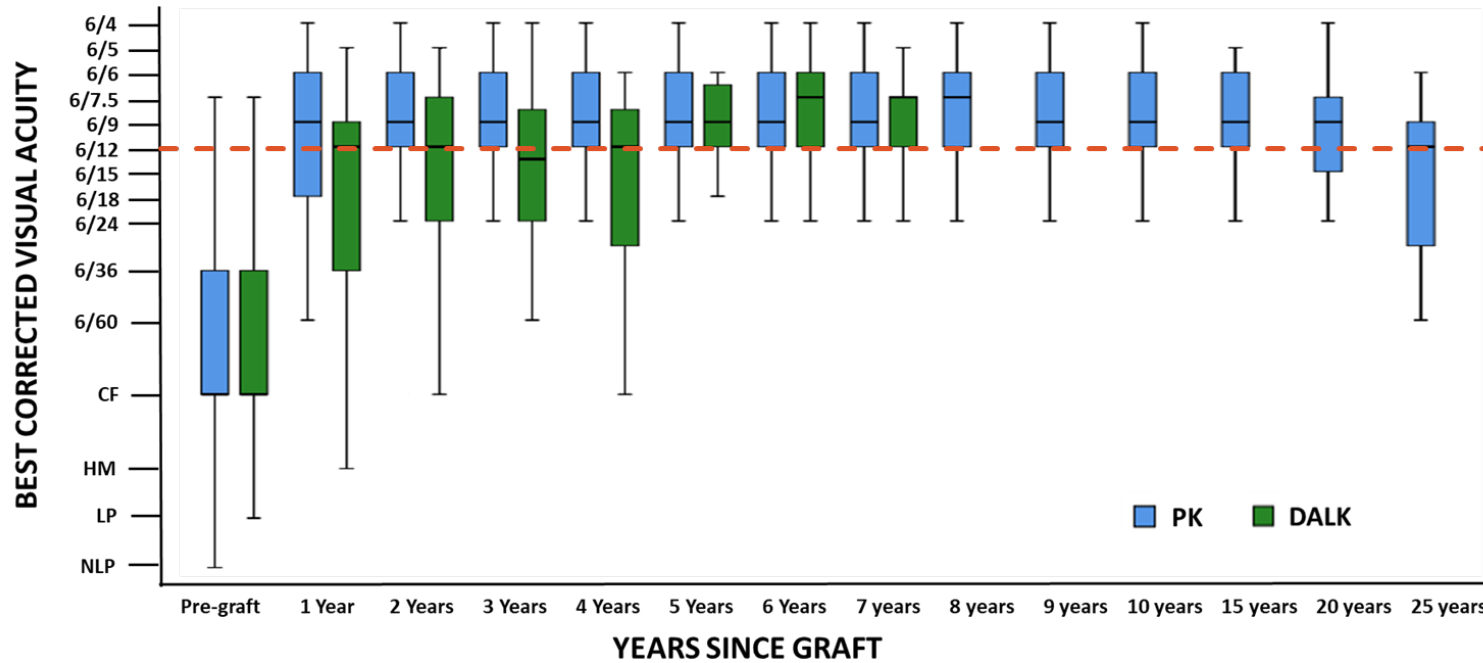


	1	5	10	15	20	25	30
PK	6034 (.98)	2850 (.94)	1556 (.88)	955 (.78)	531 (.62)	253 (.43)	64 (.20)
DALK	783 (.96)	159 (.89)	13	1	NA	NA	NA

	1	2	4	6	8	10	12
PK	1852 (.98)	1374 (.96)	786 (.92)	468 (.89)	256 (.84)	117 (.75)	44 (.68)
DALK	761 (.96)	491 (.94)	219 (.89)	96 (.87)	29 (.82)	7	NA

- ▶ Median survival of 23 years and 1 month for PK
- ▶ No significant difference in survival in past 15 years

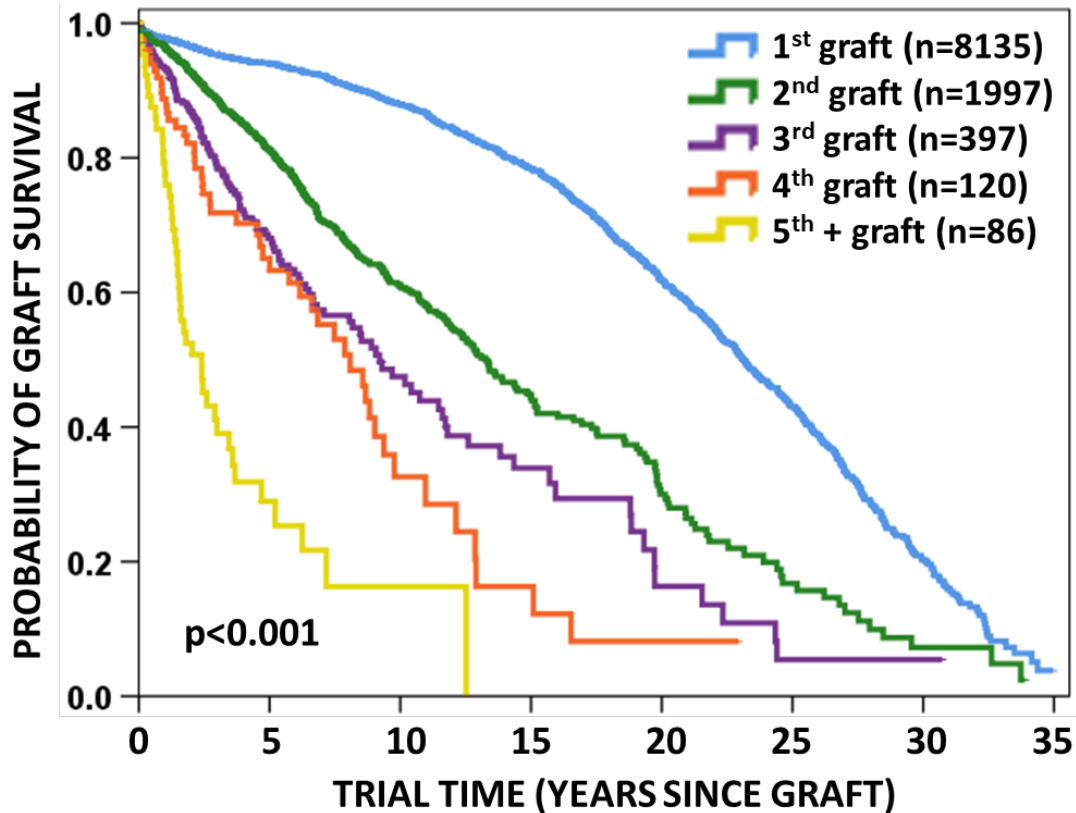
Best Corrected Visual Acuity: 1st Grafts for Keratoconus



	Pre-graft	1 year	2 years	3 years	4 years	5 years	6 years	7 years	8 years	9 years	10 years	15 years	20 years	25 years
PK	6845	1023	680	399	292	238	211	171	119	132	96	70	30	20
DALK	1401	133	91	46	24	17	20	19	5	0	1	0	0	0

- ▶ Pre-graft median BCVA of CF for both groups
- ▶ Improves to 6/9 for PK and 6/12 for DALK by 1 year post-graft
- ▶ Maintained to 7 years for DALK and 25 years for PK
- ▶ Of followed grafts, post-graft
 - ▶ 54% of PK and 41% of DALK known to wear spectacles
 - ▶ 14% of PK and 8% of DALK known to wear contact lenses

Keratoconus - Survival of Repeat PK

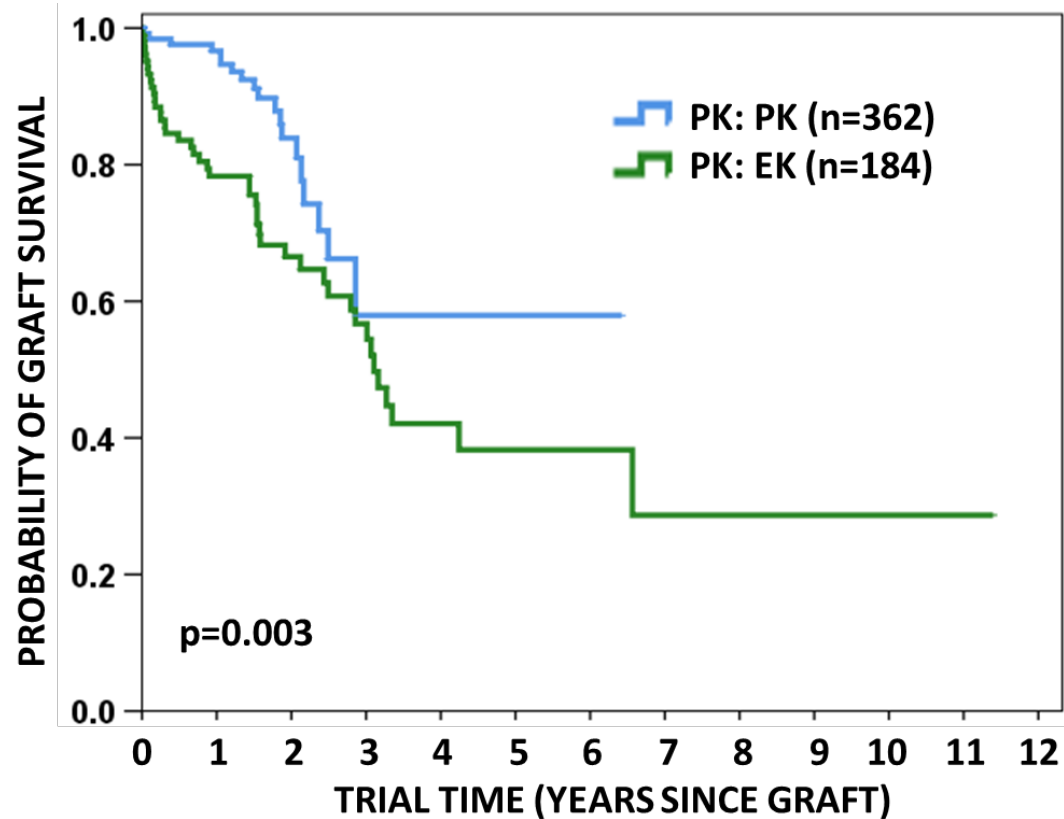


Median survival

- ▶ 23 years 1 month for first grafts
- ▶ 13 years 2 months for second grafts
- ▶ 9 years 1 month for third grafts
- ▶ 8 years 1 month for fourth grafts
- ▶ 2 years 5 months for subsequent grafts

	1	5	10	15	20	25	30
First	6034 (.98)	2850 (.94)	1556 (.88)	955 (.78)	531 (.62)	253 (.43)	64 (.20)
Second	1371 (.97)	612 (.81)	233 (.61)	93 (.44)	44 (.30)	16	4
Third	268 (.93)	104 (.68)	40 (.48)	17	6	2	1
Fourth	84 (.89)	36 (.65)	10	4	2	NA	NA
Fifth +	47 (.78)	8	1	NA	NA	NA	NA

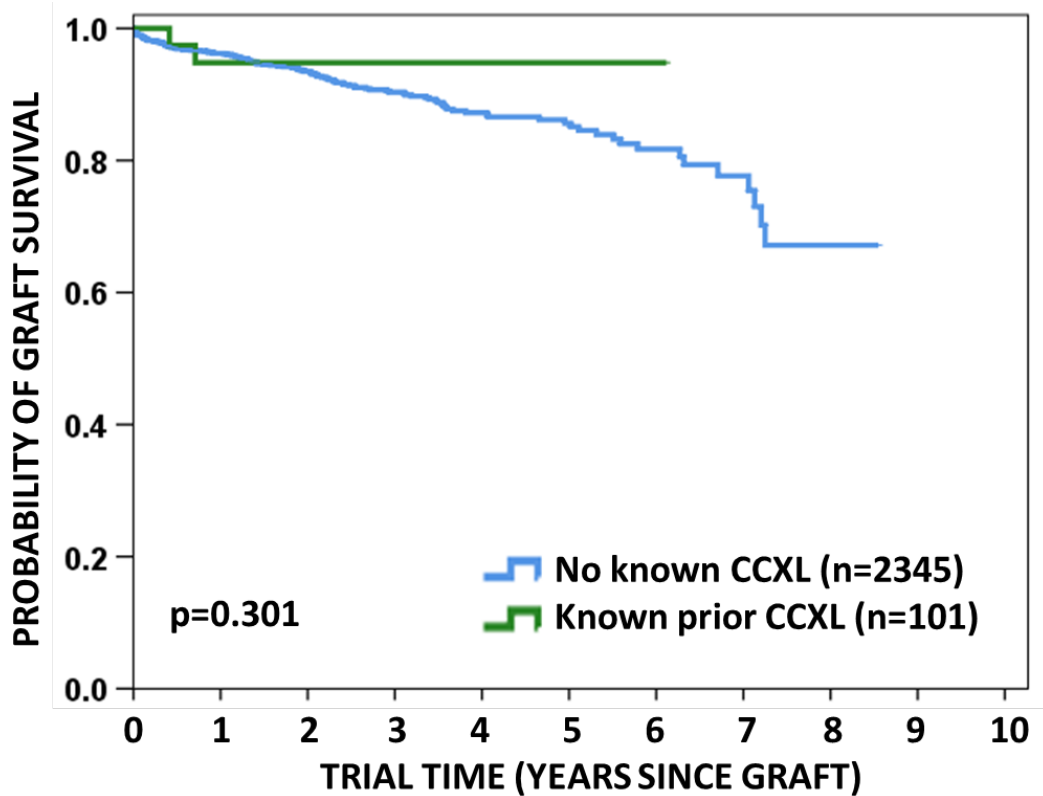
Keratoconus - Survival of 2nd Graft by Graft Type



- ▶ Grafts performed from 2006 (introduction of EK)
- ▶ Median survival for EK 3 years and 1 month

	3 months	6 months	9 months	12 months	18 months	24 months	30 months	36 months
PK:PK	122 (.98)	118 (.98)	110 (.98)	100 (.97)	72 (.92)	32 (.84)	14	5
PK:EK	91 (.88)	83 (.84)	79 (.82)	68 (.78)	53 (.76)	38 (.67)	31 (.61)	25 (.57)

Keratoconus - History of Collagen Cross Linking



- ▶ First grafts for KC
- ▶ Grafts since 2012 (case first reported to ACGR)
- ▶ Added to ACGR form in 2013
- ▶ Increase in recent years of 1st grafts with history of CCXL
 - ▶ 2013 to 2017 - Av. 3%
 - ▶ 2018 - 5%
 - ▶ 2019 - 8%
 - ▶ 2020 - 12%

	3 months	6 months	9 months	12 months	18 months	24 months	30 months	36 months
No known	1331 (.98)	1298 (.97)	1259 (.97)	1186 (.96)	974 (.95)	766 (.94)	604 (.91)	470 (.90)
Known prior	40 (1.0)	38 (.97)	36 (.95)	35 (.95)	33 (.95)	27 (.95)	21 (.95)	16

Summary of Keratoconus Results

- ▶ 2016 to 2020 has seen reductions in first grafts for keratoconus
 - ▶ Fewer grafts in recipients under 40 years old
- ▶ First PK for KC has a median survival of over 23 years
- ▶ No significant differences in survival of PK and DALK
- ▶ Visual improvement by 1 year from CF to 6/12 or better
 - ▶ Maintained for both groups (up to 25 years for PK)
 - ▶ More than half of recipients still wear spectacles or a contact lens
- ▶ Survival is reduced in repeat grafts
- ▶ Second PK have better survival than EK following first PK
- ▶ Comparable survival for eyes with prior Corneal Cross-Linking

Acknowledgments

- ▶ DonateLife - The Australian Government Organ and Tissue Authority
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- ▶ Our team
 - ▶ Nora Coffey - Project Officer
 - ▶ Vicky Jones - Administrative Officer
 - ▶ Miriam Keane - Executive Director
 - ▶ Keryn Williams - Scientific Director
 - ▶ Richard Mills - Medical Director
 - ▶ Cecily Lawson - Administrative Assistant



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2018 report: <http://hdl.handle.net/2328/37917>

