

Transplant Options for Patients: Choices and Consequences

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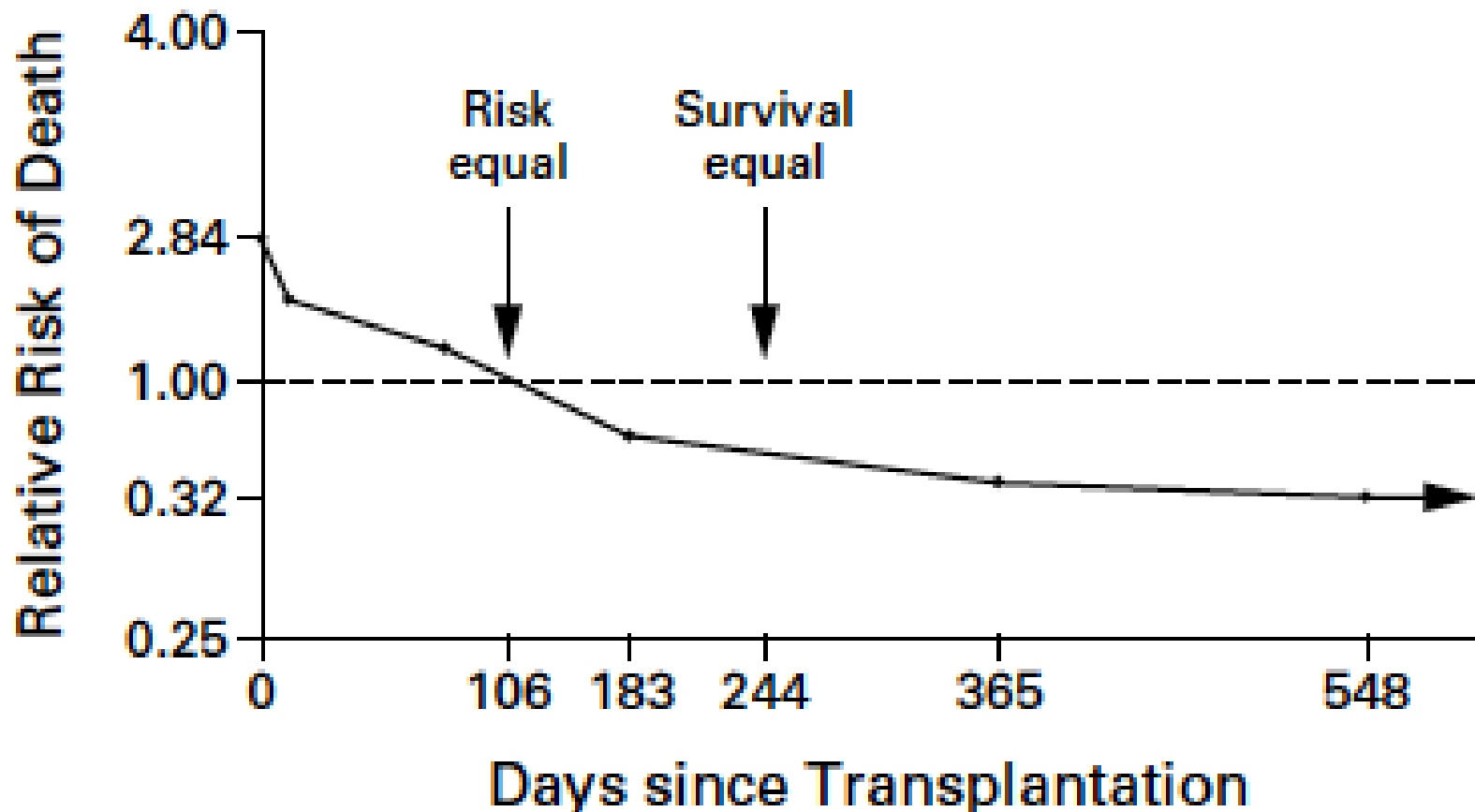
Conflict of Interest

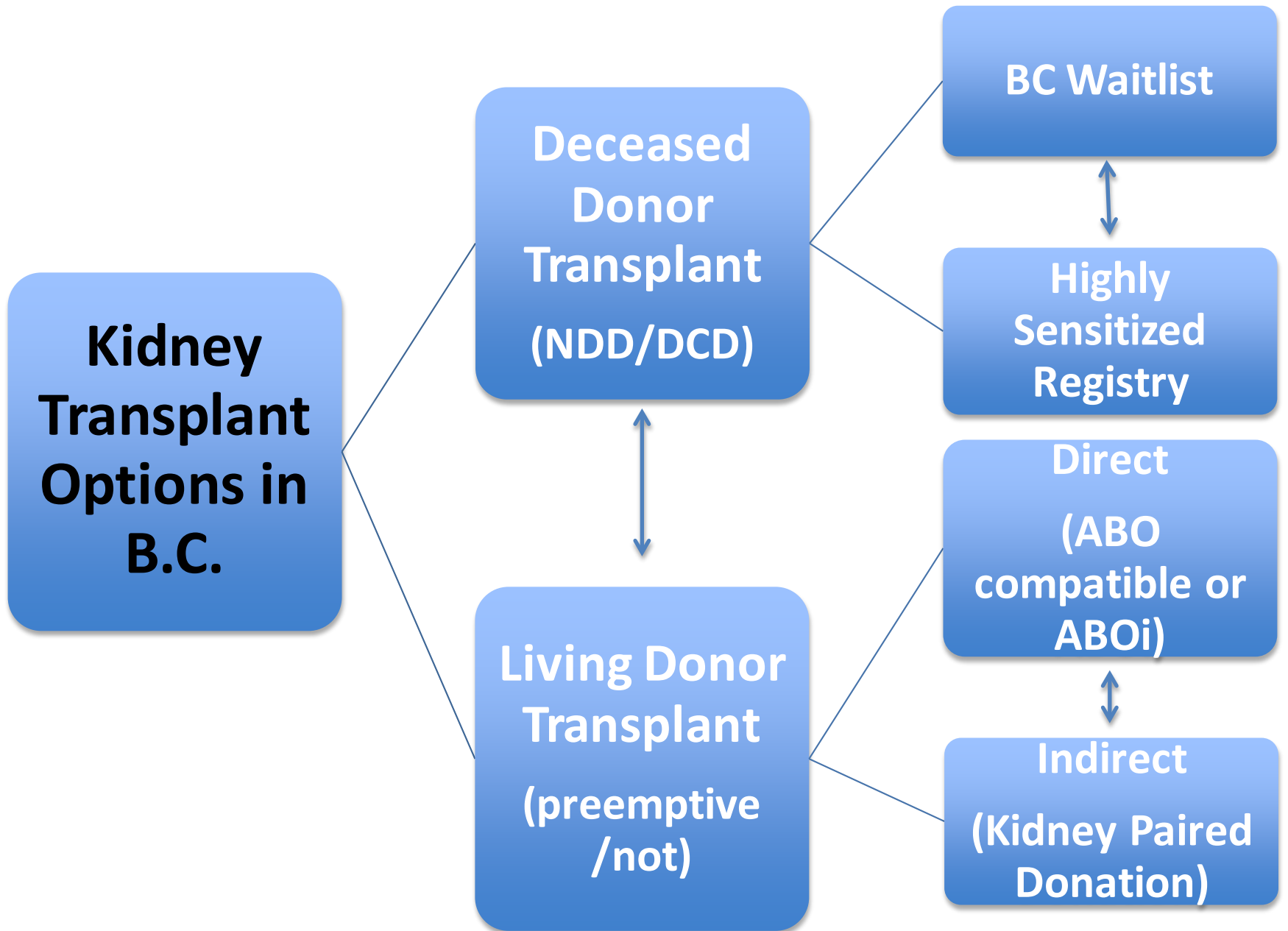
- Non contributory

Learning Objectives

1. To understand all kidney transplant options available to patients in B.C.
2. To understand the benefits, advantages and consequences of various transplant options

Undeniable Benefits of Kidney Transplantation





Kidney Transplant Activity in B.C.

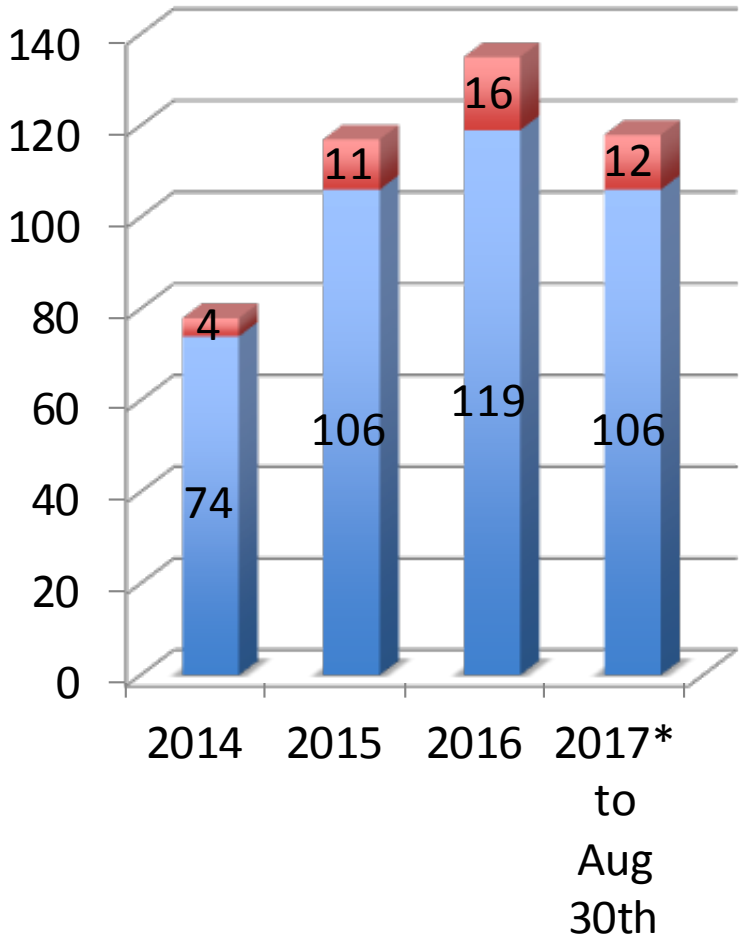
Kidney Transplant Activity in B.C.

Year	2014	2015	2016	2017 to Aug 31 st
NDD	78	117	135	118
DCD	27	48	40	45
Deceased Total	105	165	175	163
Living direct	79	94	73	43
Living indirect	25	16	22	18
Living Total	104	110	95	61
TOTAL	209	275	270	224

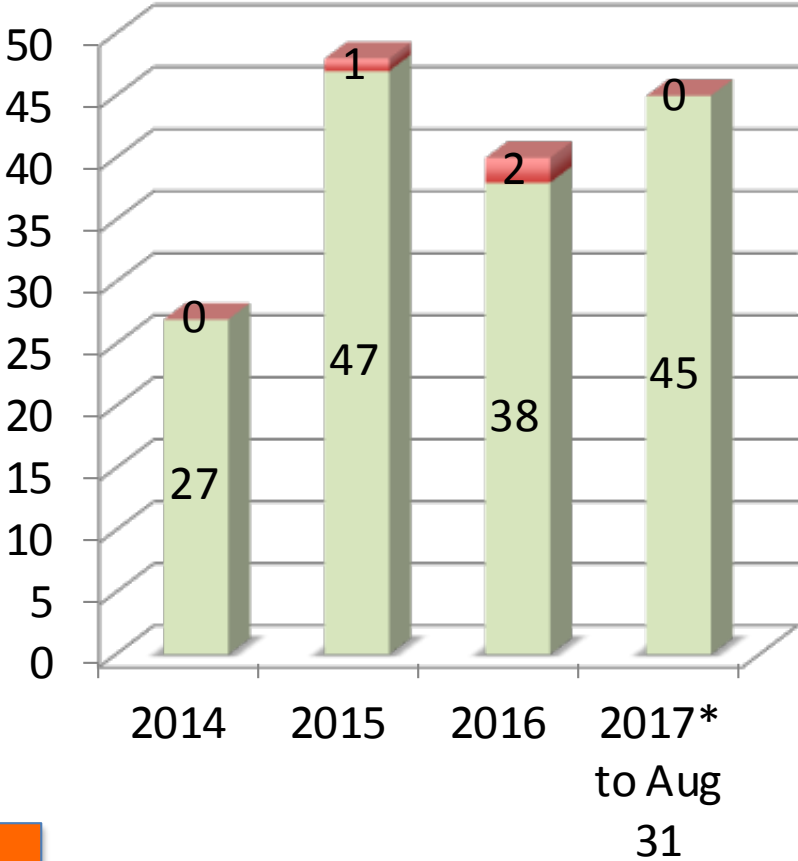
Kidney Transplant Activity in B.C.

Deceased donor transplant + HSP

NDD



DCD



HSP 

Living Donor Kidney Transplant Activity in B.C.

Pre-emptive

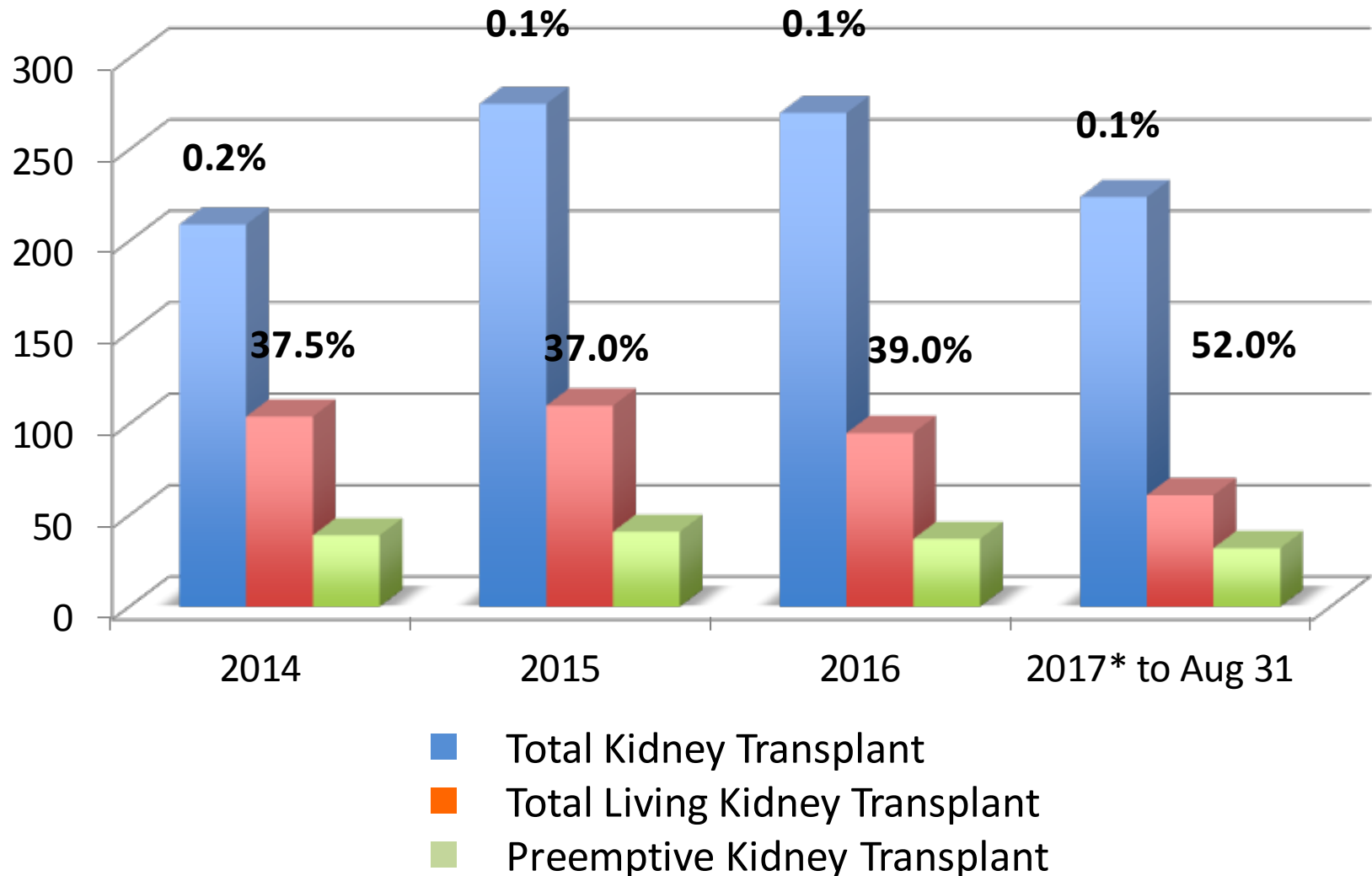
Year	Preemptive (% total living donor Tx)
2014	37.5%
2015	37%
2016	39%
2017 (to Aug 30)	52%

31
Preemptive 

31

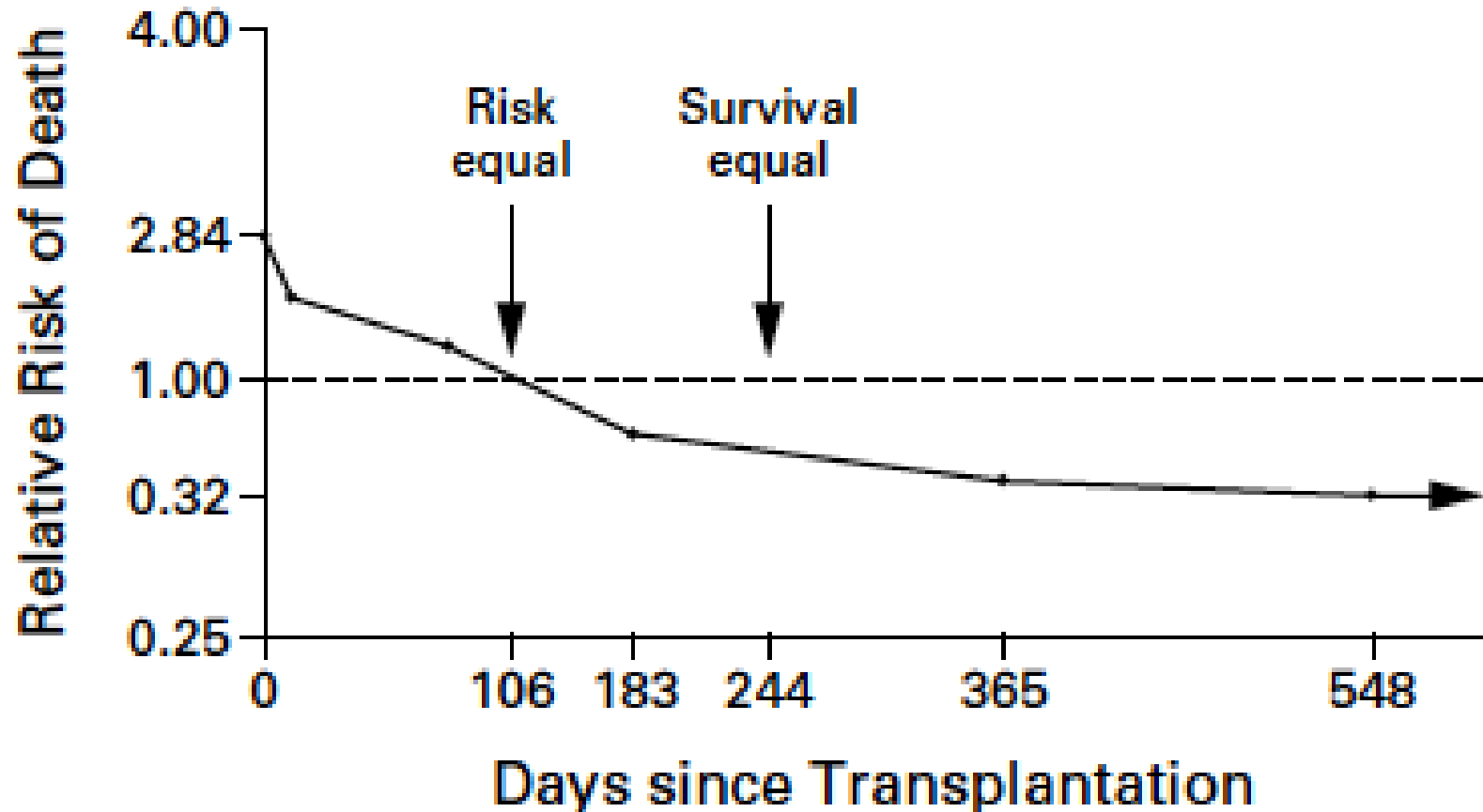
Living Donor Kidney Transplant Activity in B.C.

Pre-emptive

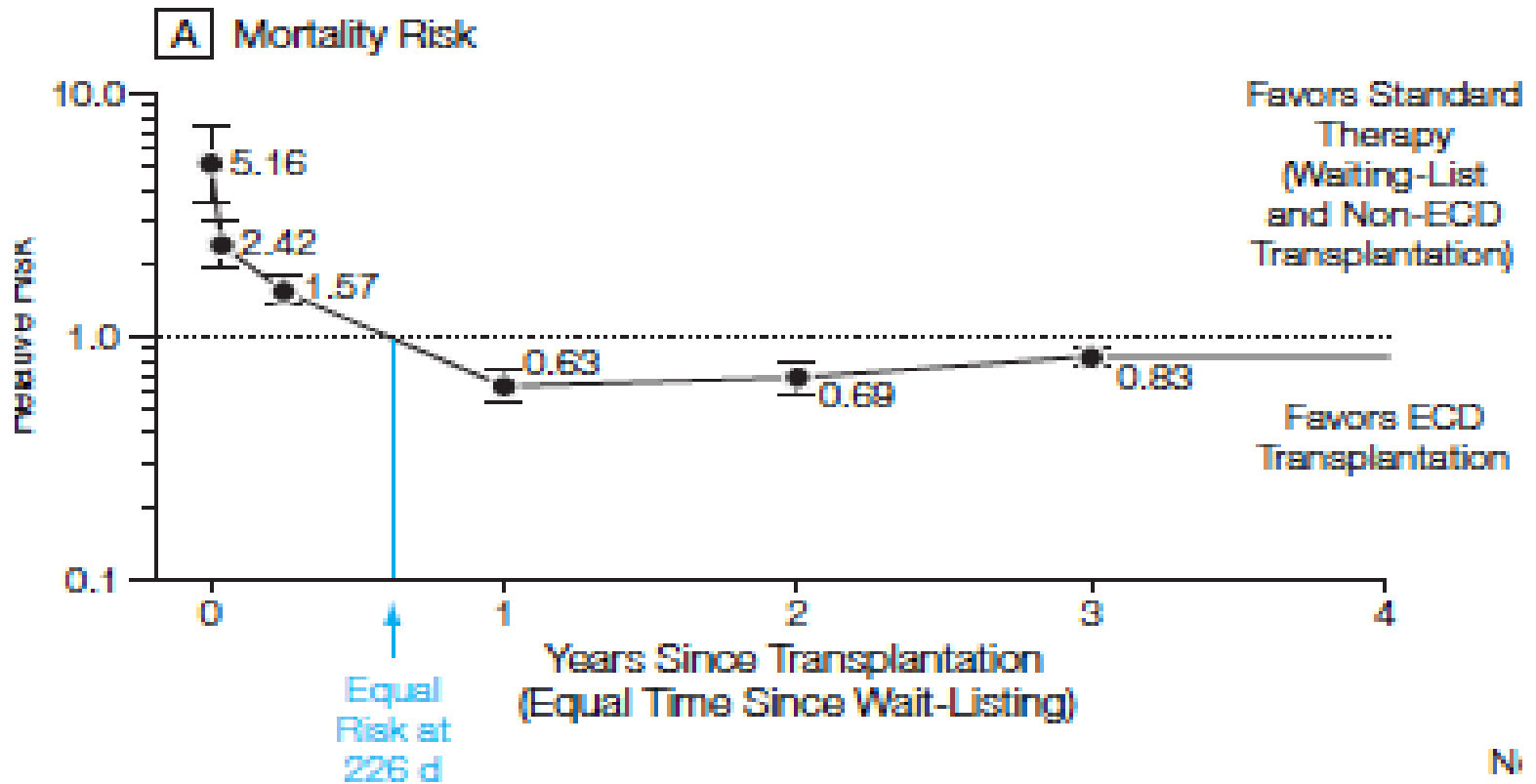


Benefit of Transplantation over Dialysis

Survival Benefit of Kidney Transplantation vs Dialysis

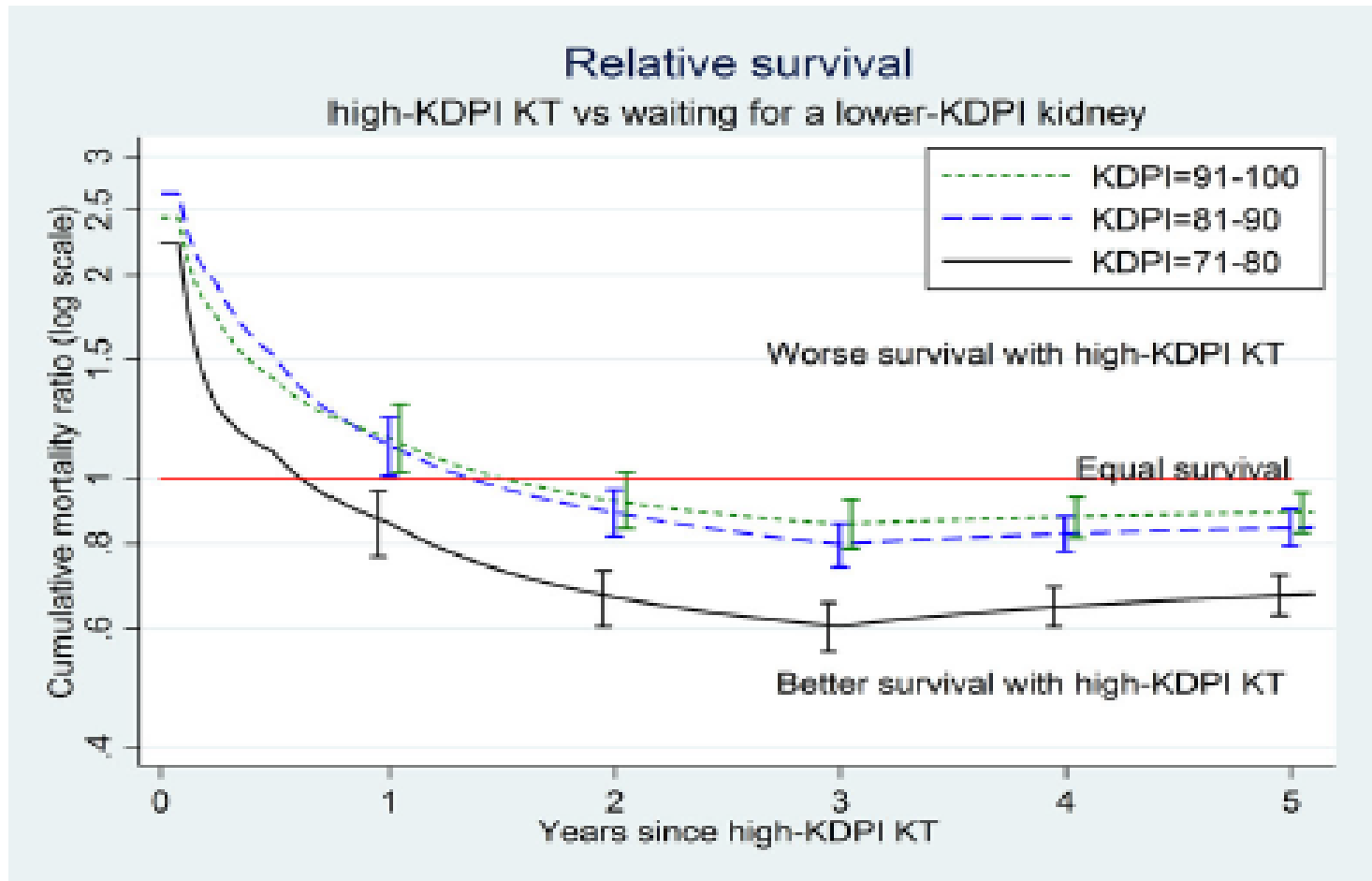


Benefit of ECD over HD

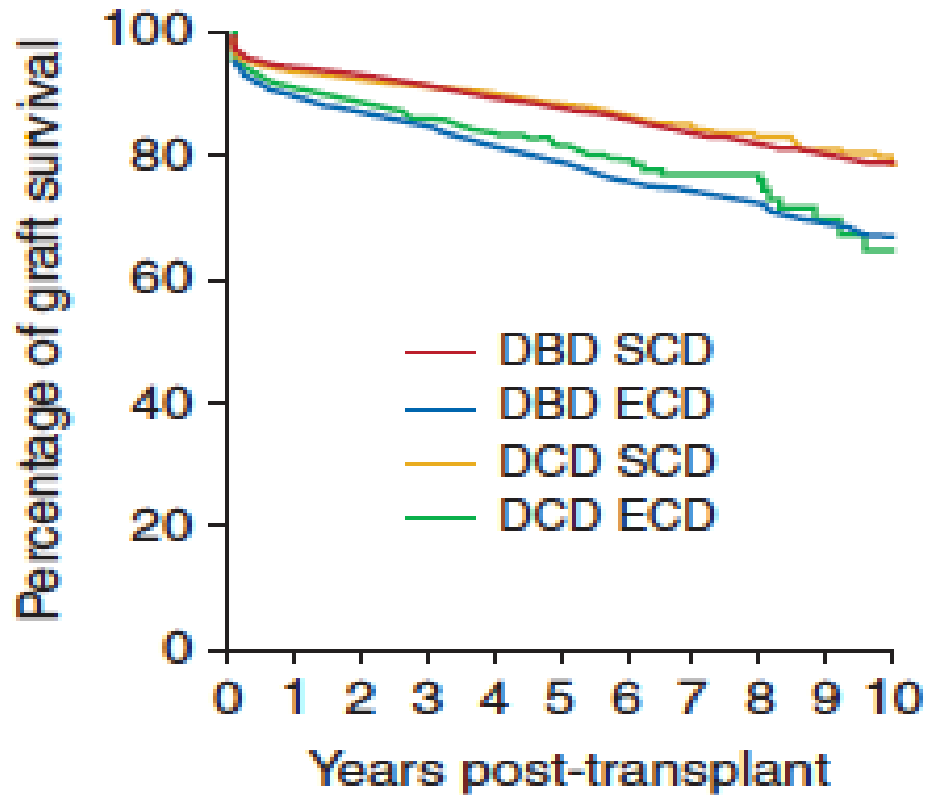


N
E
S

Benefit of High KDPI over HD



Benefit of DCD or NDD



Benefit of Living Donor Transplant over Deceased Donor (especially in particular populations)

1. Survival
2. Time
3. Living donation and elderly
4. Living donation and obese

B.C.: All Cause Graft **Survival** (%) in First Adult Kidney Transplant Patients by Age Group, 2006-2016

Donor Type	Age Group	3 Months	1 Year	3 Years	5 Years
Living	18-44 Years	99.4	98.8	95.6	91.5
	45-54 Years	100.0	99.1	96.1	89.6
	55-64 Years	98.8	97.7	94.3	86.2
	65+ Years	98.5	95.6	93.9	87.6
Deceased	18-44 Years	97.0	96.5	94.2	90.7
	45-54 Years	98.3	98.3	94.9	92.8
	55-64 Years	95.4	94.5	87.5	81.9
	65+ Years	91.1	88.6	82.9	72.9

Canada: All Cause Graft Survival (%) in First Adult Kidney Transplant Patients by Age Group, 2006-2015

Donor Type	Age Group	3 Months	1 Year	3 Years	5 Years
Living	18-44 Years	98.4	97.4	94.2	90.8
	45-54 Years	99.1	97.4	94.2	90.5
	55-64 Years	99.0	97.7	94.5	87.4
	65+ Years	98.2	95.6	91.9	84.8
Deceased	18-44 Years	97.6	95.9	91.0	85.9
	45-54 Years	97.6	95.7	91.7	88.0
	55-64 Years	96.7	93.2	87.1	81.3
	65+ Years	95.7	90.7	83.0	74.5

Note: Excludes Quebec because of under-reporting between 2011 and 2015

Source: Canadian Organ Replacement Register, 2016, CIHI

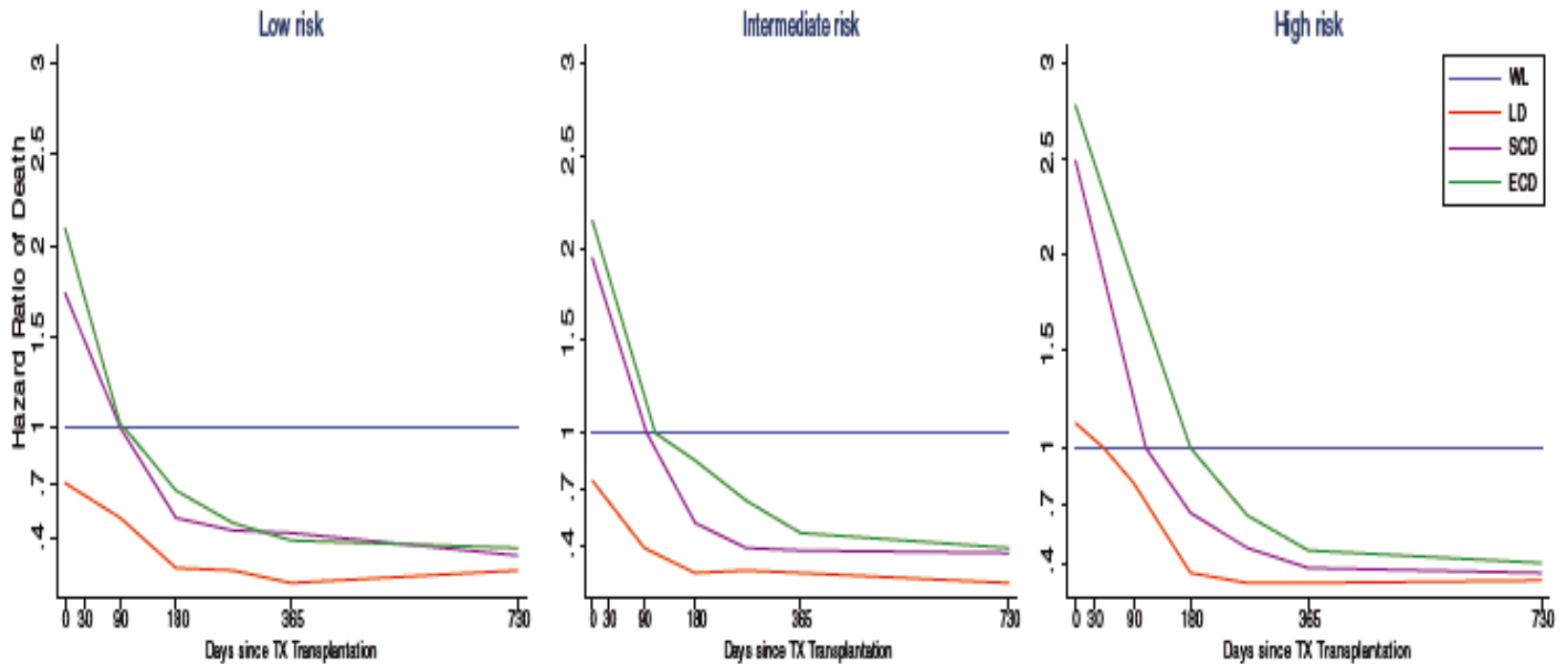
Current Deceased Donor Wait **Time** (days) by Blood Type and Age in B.C. (Jan 1st – Aug 31st 2017)

Blood Type	Age on WL <35y	Age on WL 35-59y	Age on WL ≥ 60y
A	813 (2.2y)	956 (2.6y)	926 (2.5y)
B	1384 (3.8y)	1979 (5.4y)	1854 (5y)
AB	319 (11m)	540 (1.5y)	N/A
O	707 (1.9y)	1076 (2.9y)	1210 (3.3y)

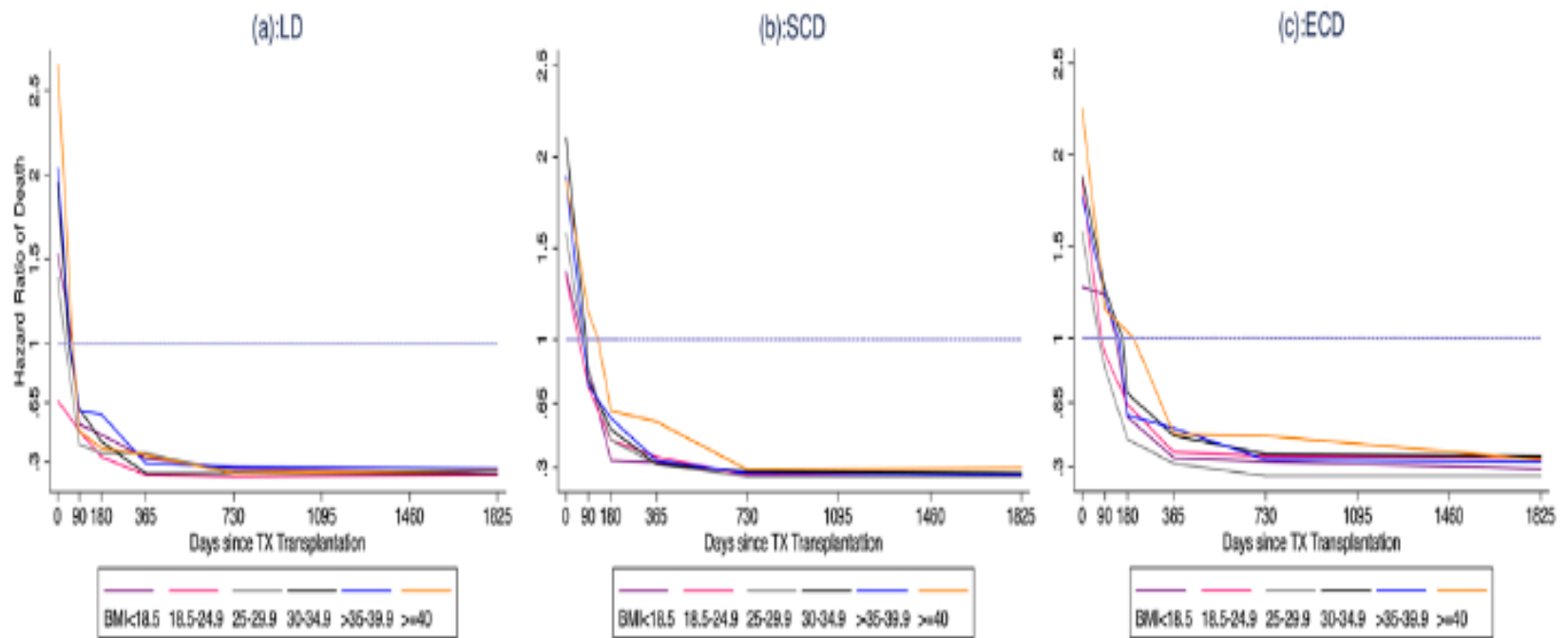
Dialysis start date for patients currently receiving Deceased Donor Transplantation by Blood Type and Age in B.C. (cPRA 0%)

Blood Type	Age on WL <60y	Age on WL ≥ 60y
A	2015	2015
B	2014	2013
AB	2016/7	2016
O	2015	2015

Benefit of Living Donor Transplantation in the Elderly



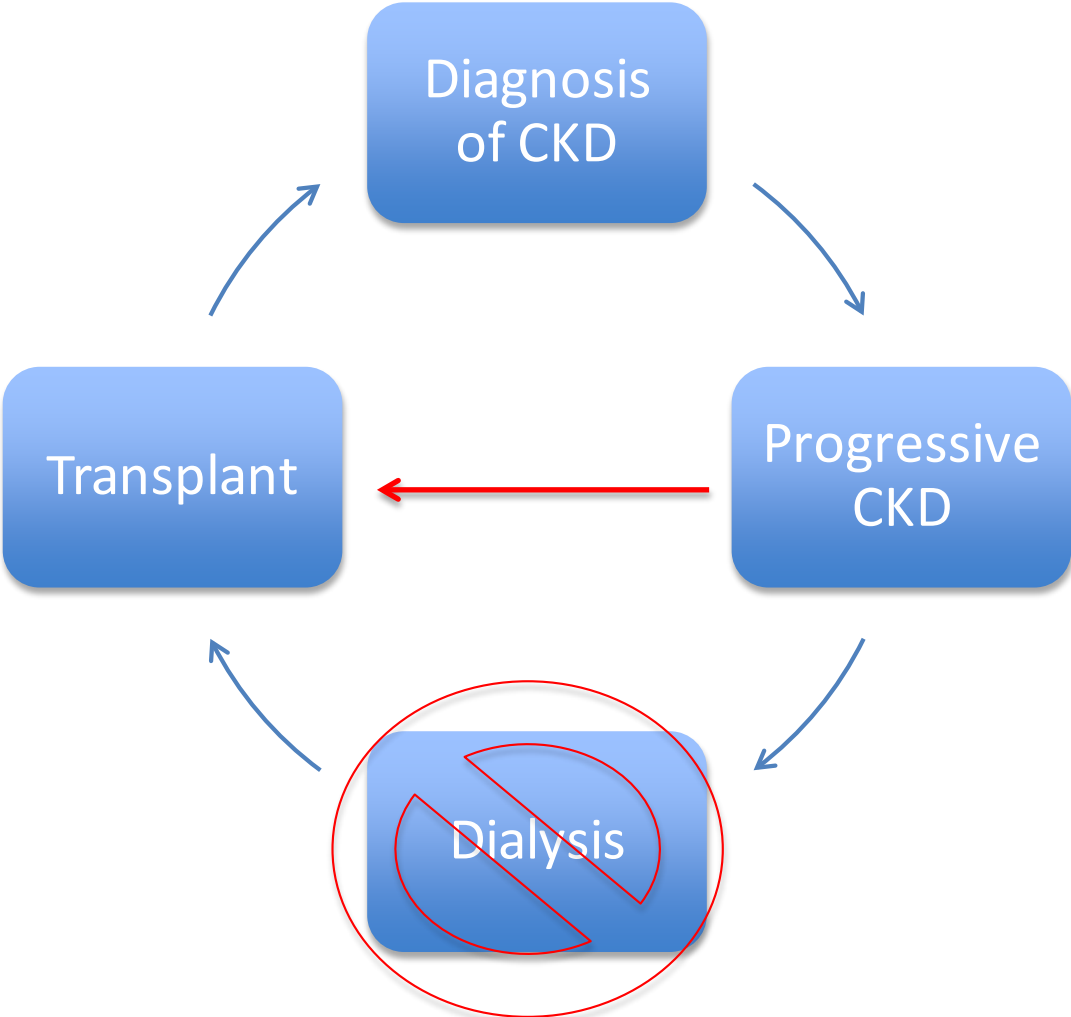
Benefit of Living Donor Transplantation in the **Obese**



Benefits of Preemptive Transplantation

1. Survival
2. QOL
3. Economic
4. Overall Health

Transitions



1. Increased Patient Survival with Less Time on Dialysis

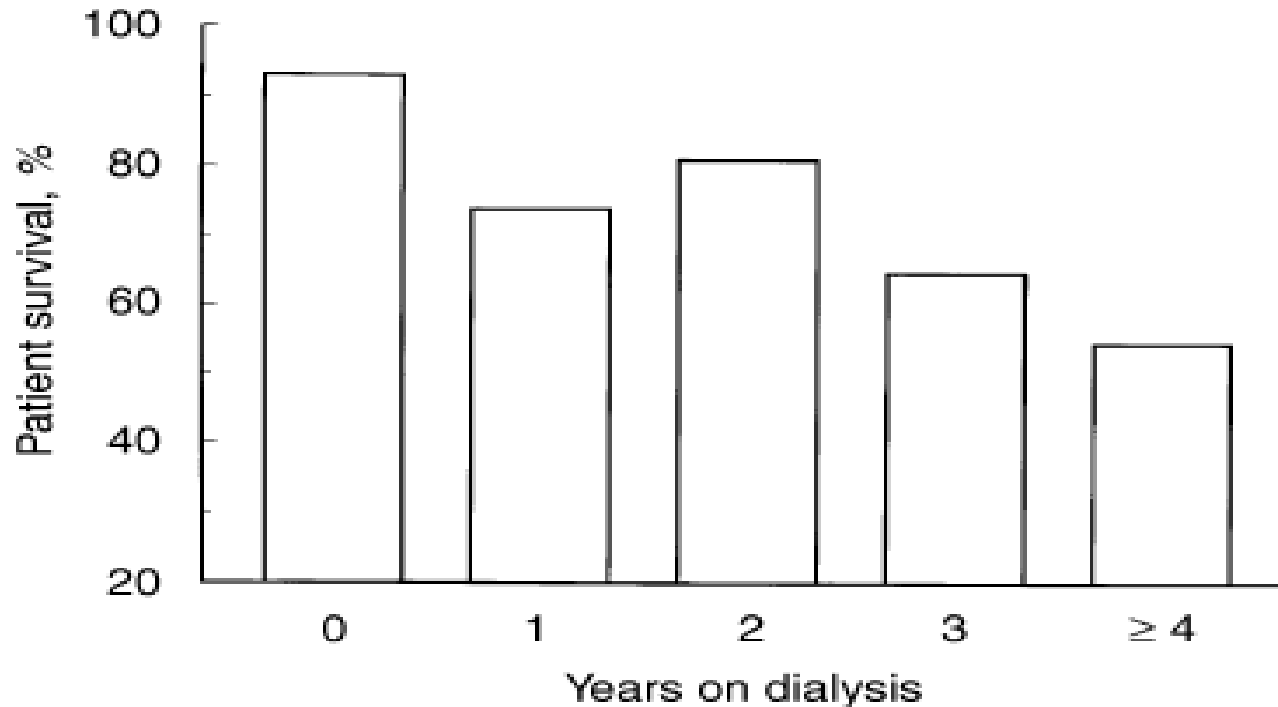


Fig. 1. Relationship between time on dialysis (x axis) and patient survival after renal transplantation. The number of patients in each group is according to their duration on dialysis: 0 year, $N = 29$; 1 year, $N = 205$; 2 years, $N = 137$; 3 years, $N = 45$; ≥ 4 years, $N = 46$.

Preemptive kidney transplant patients live longer than patients transplanted on dialysis

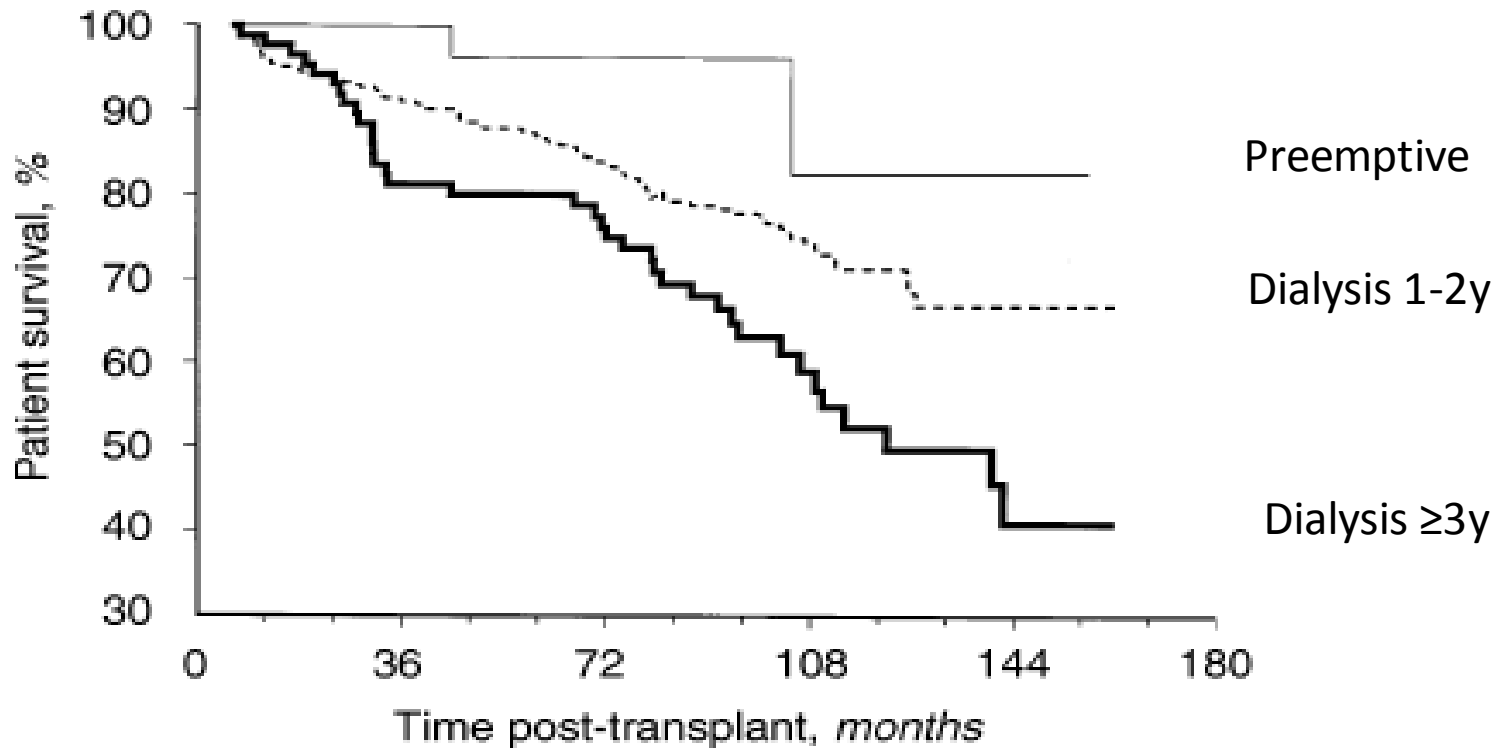


Fig. 2. Kaplan-Meier plots of patient survival. Patients were divided into three groups according to the time that they had spent on dialysis (any modality) prior to transplantation: No dialysis (-); 1 to 2 years ($\frac{1}{4}$); or \geq three years (—). Cox regression: $P = 0.0003$.

5- and 10-year graft survival rates are worse in patients who have >24m of dialysis vs. <6m

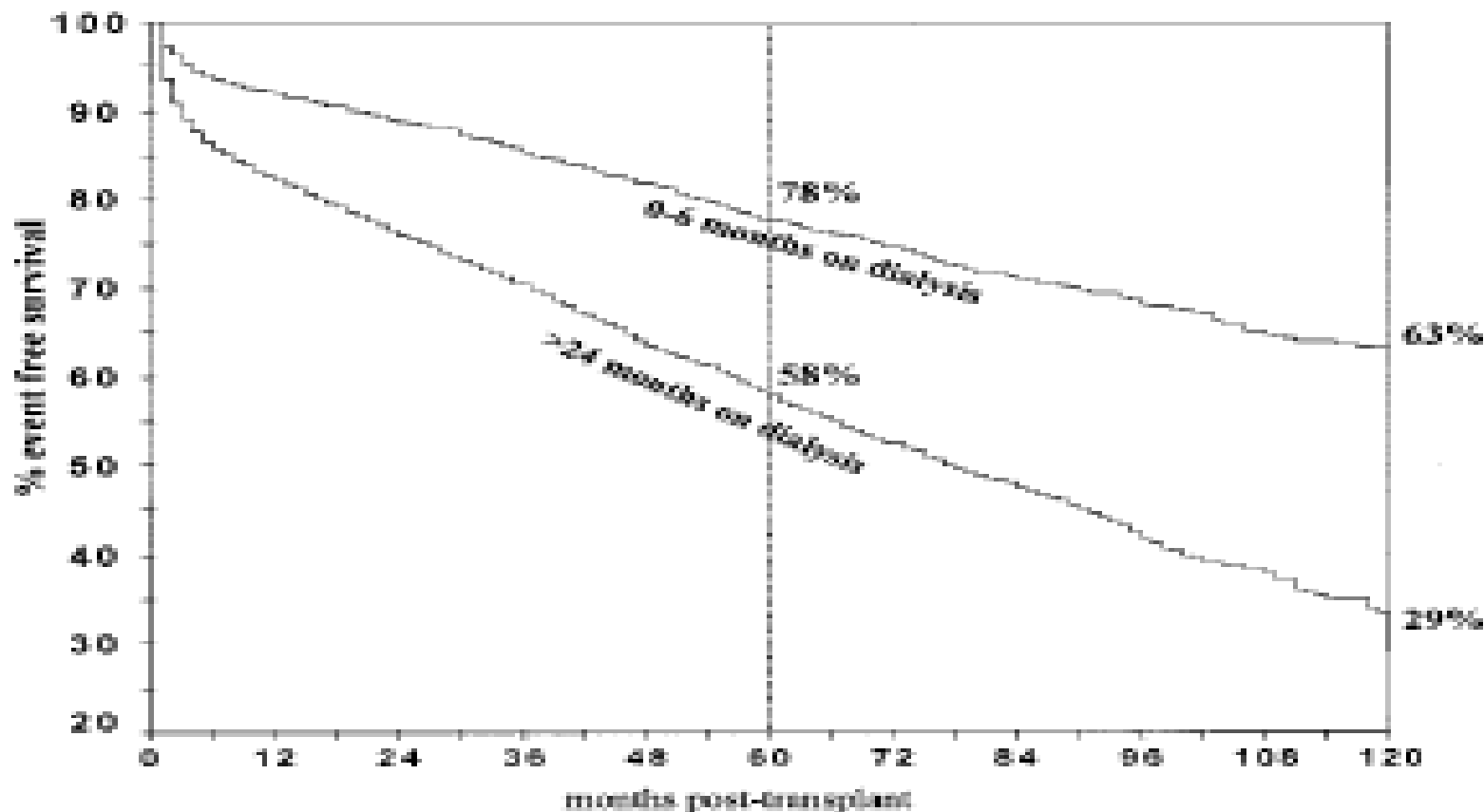


Figure 1. Unadjusted graft survival in of 2,405 recipients of paired kidneys with short compared to long ESRD time.

Preemptive transplant is associated with a superior graft survival after Repeat Transplantation

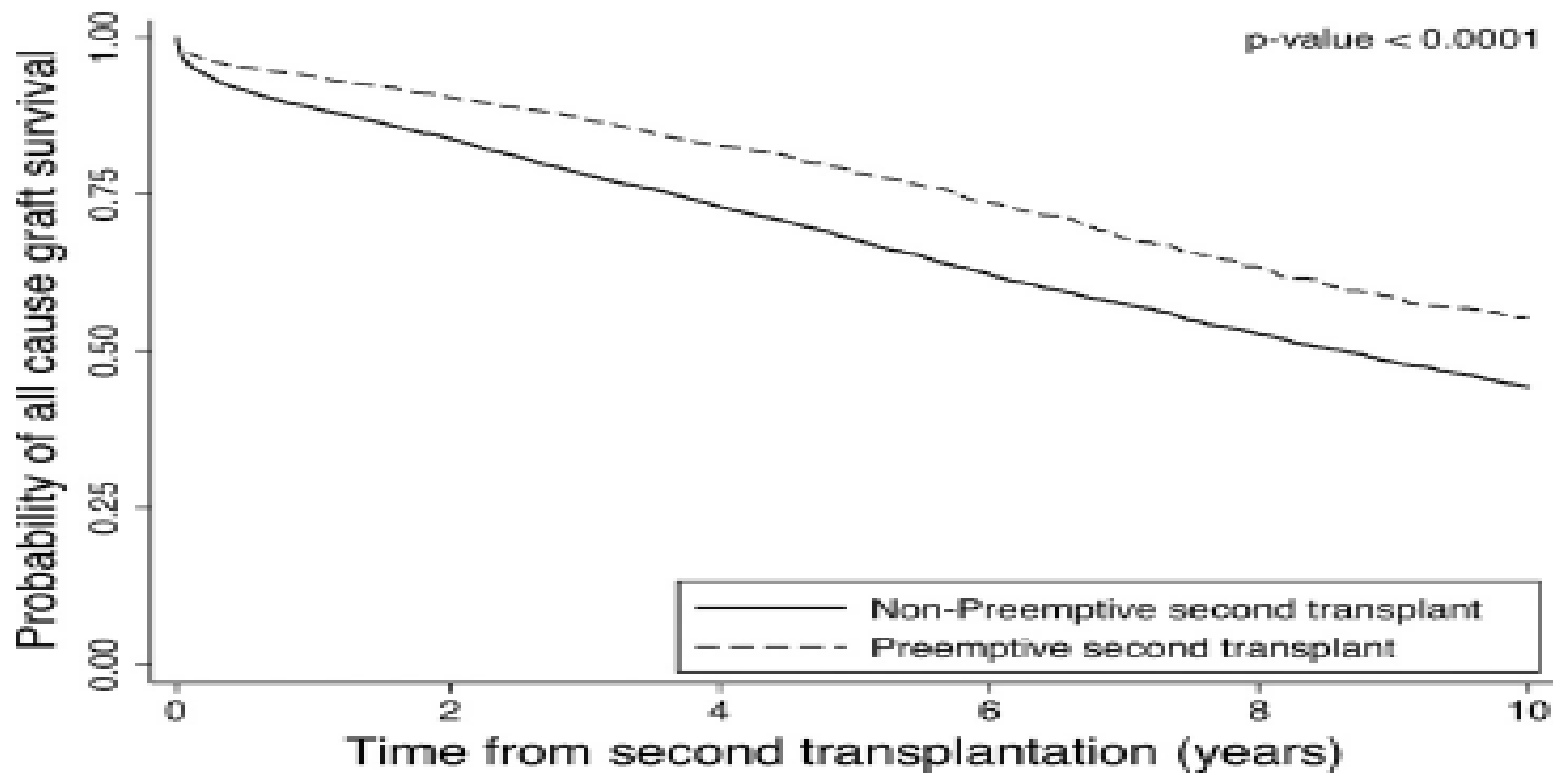


FIGURE 1. Time to all-cause graft loss.

2. Preemptive transplant is associated with increased QOL

- QOL benefit especially in adolescents

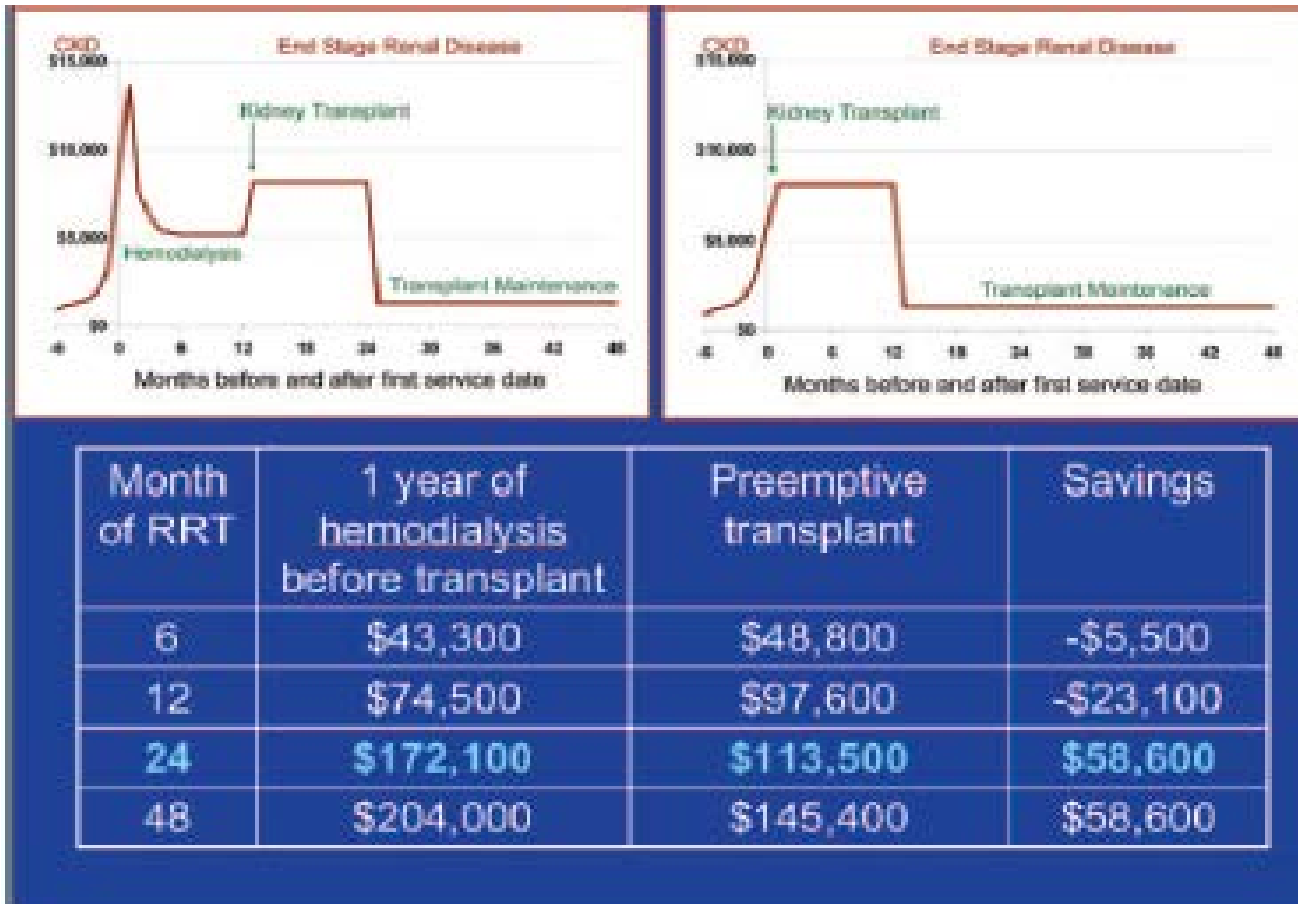
Riano-Galan I et al *Pediatr Nephrol* 2009; 8:1561

- When a patient begins RRT, or transitions from one modality of care to another, there is a dramatic decline in QOL measures

Kimmel PL *KI* 2001; 59:1599

Watnick S et al *AJKD* 2003; 41: 105

3. U.S. cost savings through dialysis avoidance



Preemptive transplantation is associated with economic benefits

- Patients on dialysis >1y: 24% returned to work post transplant
- Preemptive transplant patients: >50% returned to work post transplant ¹.
- Duration of disability before transplantation influences return-to-work rates and family dynamics ².

1 Gaston RS et al Medical Management of Kidney Transplantation 2005: 231

2 Muerher RJ et al Semin Dial 2005: 18:124

Economic: Other

- Reduced need for dialysis access
- Reduced dialysis catheter-related infections
- Reduced hospitalization rates

4. Overall Health benefits with preemptive transplantation

- Improved growth in children ¹
- Decreased rejection rates ^{2,3}
- Fewer sensitization events ^{2,3}
- Reduced cardiac systolic dysfunction ^{2,3}
- Decreased overall hospitalizations ^{2,3}

1 Riano-Galan I et al Pediatr Nephrol 2009; 24:1561

2 Mange K et al Am J Transplant 2003; 3:1336

3 el-Agroudy AE et al Transplant 2004; 77:1366

BC has the best preemptive living donor transplant record in the country

Table 5 Incident patients by initial treatment and province/territory, Canada (excluding Quebec), 2014 (number, percentage of total)

		Province/territory										Canada					
		B.C./	Y.T.	Alta./ N.W.T./	Nun.	Sask.	Man.	Ont.	N.B.	N.S./	P.E.I.		N.L.				
Initial treatment	N	504		435		151		198		2,454		71		137		119	4,069
	%	69.2		72.1		73.7		72		79.8		86.6		80.6		91.5	77.2
CAPD	N	126		132		47		66		248		10		22		11	662
	%	17.3		21.9		22.9		24		8.1		12.2		12.9		8.5	12.6
APD	N	62		19		3		3		293		1		4		0	385
	%	8.5		3.2		1.5		1.1		9.5		1.2		2.1		0	7.0
Pre-emptive	N	36		17		4		8		81		0		7		0	153
	%	4.9		2.8		2		2.9		2.6		0		4.1		0	2.9
Total	N	728		603		205		275		3,076		82		170		130	5,269

- Despite the benefits of PreTx, it is concerning that the majority of recipients of living donor kidneys also undergo dialysis pre-transplant.
- With LDKT, historically, <30% recipients undergo PreTx in US; 37%+ in BC.

Interactive Cases

Case # 1

- M.N. 76 yo male
- Blood group B
- Fully functioning; likes to travel; 3 grandchildren
- Stage 5 CKD (creatinine 350; GFR 14 ml/min)

Case # 1: question #1

Is transplantation the best renal replacement modality for him?

1. Yes
2. No

[Live Poll Results](#)

Case # 1: question #2

What kidney transplantation option would be the most favorable in his case?

1. Deceased donor transplantation
2. Living donor transplantation after starting dialysis
3. Preemptive living donor transplantation

[Live Poll Results](#)

Case # 2

- O.P. 24 yo female
- Blood group 0
- CKD secondary to reflux nephropathy
- Rapid decline in renal function (creatinine 375; GFR 17 ml/min)
- Accountant in full time employment

Case # 2: question #1

Is transplantation the best renal replacement modality for her?

1. Yes
2. No

[Live Poll Results](#)

Case # 2: question #2

What kidney transplantation option would be the most favorable in her case?

1. Deceased donor transplantation
2. Living donor transplantation after starting dialysis
3. Preemptive living donor transplantation

[Live Poll Results](#)

Case # 3

- C.N. 55 yold female
- Blood group A
- ESRD secondary to diabetic nephropathy
- Commenced HD March 15th 2017
- BMI 34
- multiparous, multiple blood transfusions

Case # 3: question #1

Is transplantation the best renal replacement modality for her?

1. Yes
2. No

[Live Poll Results](#)

Case # 3: question #2

What kidney transplantation option would be the most favorable in her case?

1. Deceased donor transplantation
2. Living donor transplantation
3. List for both

[Live Poll Results](#)

Case # 4

- P.G. 60 yo male
- Blood group A
- ESRD secondary to hypertensive nephrosclerosis
- Preemptive living donor transplant 1999
- Failing graft (creatinine 270; GFR 19 ml/min)
- Multiple acute tubular injury episodes
- PRA 99%

Case # 4: question #1

Is transplantation the best renal replacement modality for him?

1. Yes
2. No

[Live Poll Results](#)

Case # 4: question #2

What kidney transplantation option would be the most favorable in his case?

1. Deceased donor transplantation
2. Living donor transplantation
3. Preemptive living donor transplantation

[Live Poll Results](#)

Summary and “Take-Home” messages

- Kidney transplantation is the best renal replacement modality with superior graft and patient survival compared with dialysis
- Living donor transplantation has increased survival (particularly in high risk populations), scheduling benefits over deceased donor transplantation.
- Preemptive living donor transplantation has increased survival, health, QOL and economic benefits over transplantation after starting dialysis

Where do we go from here?

- It is important to inform and educate CKD patients early about the benefits of transplantation to allow the potential for preemptive transplantation
- *Transplant First* initiative in B.C.

Questions?

