

## Thinking of Buying a Kidney? ...

### Our Experience With Living-Unrelated (Commercial) Renal Transplantation

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## Thank you:

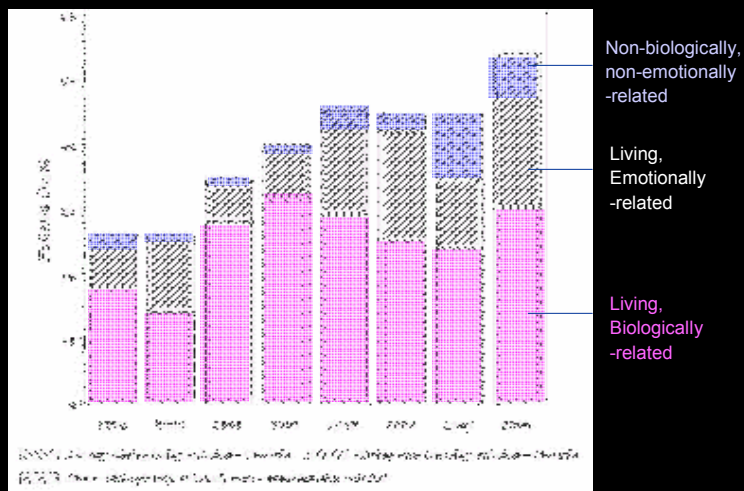
- Dr. J. Zaltzman
- Dr. R. Prasad
- Dr. A. Shukla
- Dr. R. Stewart
- Dr. K. Pace
- Dr. J. D'A Honey

# Objectives

1. Highlight cases of renal Tx purchased abroad
2. Review Commercial Tx at St. Michael's Hospital
3. Compare to local outcomes (pt- and graft-survival)
4. World experience
5. Practical points

~ 5% of our renal Tx recipients have purchased a kidney

# Living-Donor Tx at St Michael's Hospital



### Case 1:

- 37 yo ♀, Com Tx in Pakistan, wound infection
- 7 weeks - fever, hypotension, RLQ pain, WBC = 30



### Case 1: 7 weeks post-transplantation



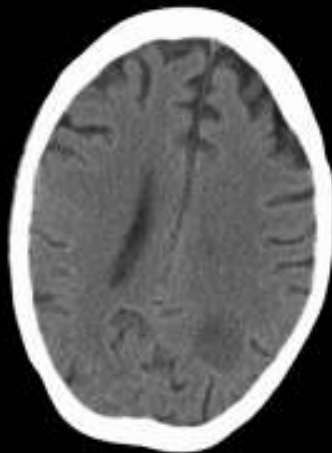
Case 1:



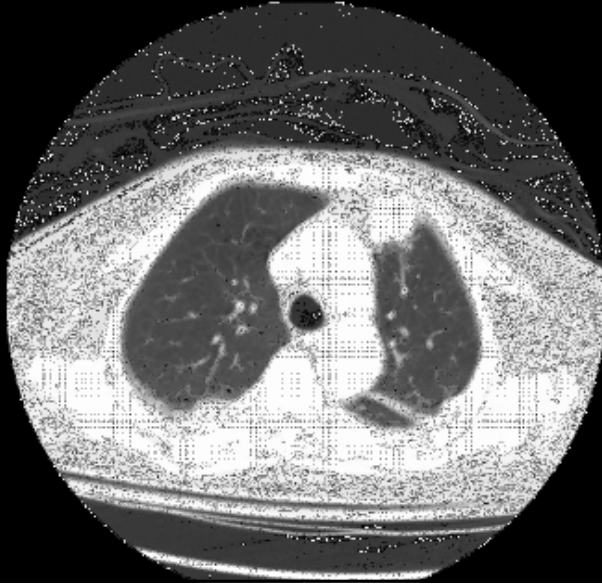
- MRSA (wound)
  - Aspergillus (wound, blood)
  - E. Coli (wound, blood)
  - Enterobacter (wound)
  - Pseudomonas (blood, wound, lungs)
- Graft survived 3 months (Tx nephrectomy)
  - Patient survived 5 months

Case 2:

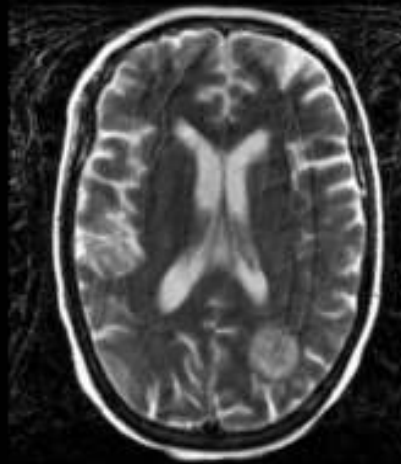
- 64 yo ♀, chronic pyelo, predialysis, Com Tx in Pakistan
- 3 weeks - direct to ER with E. coli urosepsis, oral ulcers
- 5 months - seizures and status epilepticus



Case 2: 5 months post-transplantation  
Bronchoscopy = Aspergillus

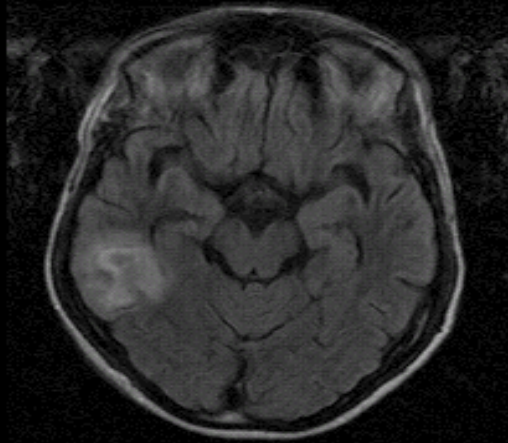


Case 2: 6 months post-transplantation  
- Septic shock, disseminated Aspergillus  
- Died at 6 months (with graft function)



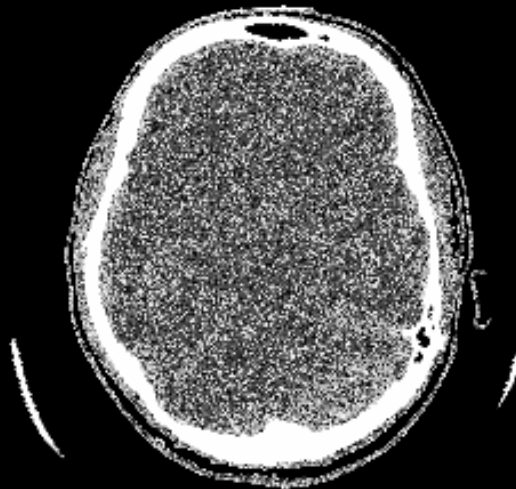
**Case 3:**

- 32 yo ♂, Com Tx India
- 2 months - massive bloody diarrhea, CMV colitis
- Disseminated fungi - *Aspergillus*, *L. Theobromae*, *P. Boydei*



**Case 3: 1 year later**

- Acute rejection, ARDS, developed neurological Sx
- Died at 16 months
- Cr = 380



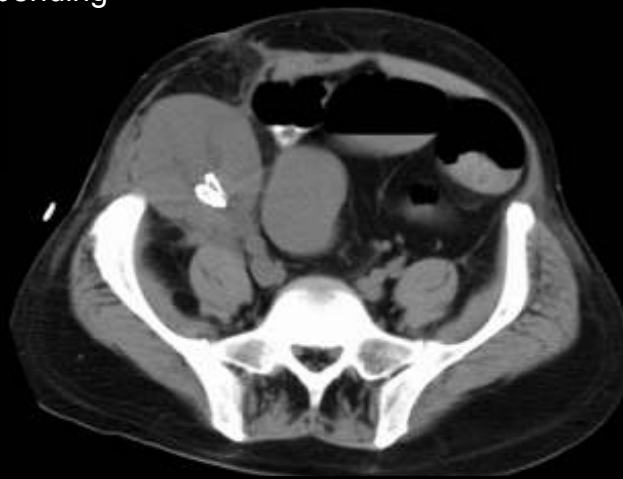
**Case 4:**

- 50 yo ♂, predialysis, Com Tx Pakistan
- 3 weeks direct to ER – copious drainage from wound, E. Coli



**Case 4: 2 months post-transplantation**

- Graft survival = 3 months
- Next Tx pending



# Commercial Renal Transplantation: Our Experience at St. Michael's Hospital

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## METHODS:

Retrospective Review 1999 - 2005

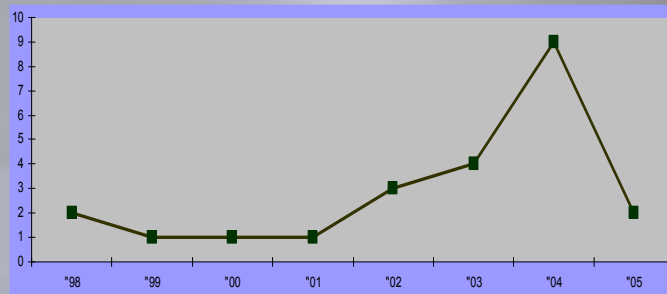
1. Canadian resident with ESRD
2. Tx outside NA or West. Europe
3. Followed at our center for post-Tx care

### Exclusion criteria:

1. Immigration to Canada after Tx



## Results: Commercial Renal Transplantation at St. Michael's Hospital by Years



23 cases of commercial renal transplantation

## RESULTS: Demographics

Commercial Tx	23
Patients	21
Age	49.4 ± 16.2 yrs
Male	13 (56.5%)
Duration of ESRD	22.2 ± 20.3 months
Predialysis	3
Cadaveric wait-list	27 ± 11.2 months (n=4)
<u>Etiology of ESRD:</u>	
Unknown	7 (30.4%)
GN	8 (34.8%)
DM / HTN	5 (21.7%)
ADPKD	2 (8.7%)
Pyelonephritis	1 (4.3%)

## RESULTS: Demographics

### Countries of Origin:

Somalia	5 pts
Iran	4 pts
China	3 pts
Pakistan	3 pts
Sri Lanka	3 pts
Vietnam	1 pt
Canada	1 pt
Palestine	1 pt
Philippines	1 pt

### Country of Transplantation:

Pakistan	10 pts
China	5 pts
Iran	3 pts
India	3 pts
Turkey	1 pt
Philippines	1 pt

**Follow-up 30.7 ± 26.5 months (2– 89 months)**

## RESULTS:

- Medical documents 90.9% (20/22)
- Hospital stay abroad 22.6 ± 30.7 days (14 pts)
- Medically unstable, requiring admission 38.1% (8 pts)
  1. CMV colitis, invasive fungal infections
  2. Febrile neutropenia and bacterial sepsis
  3. Paraspinal abscess and L3 osteomyelitis
  4. Infected ureteral leak
  5. Post-op ileus
  6. Hyponatremia
  7. Acute rejection
  8. Tx obstruction with stone

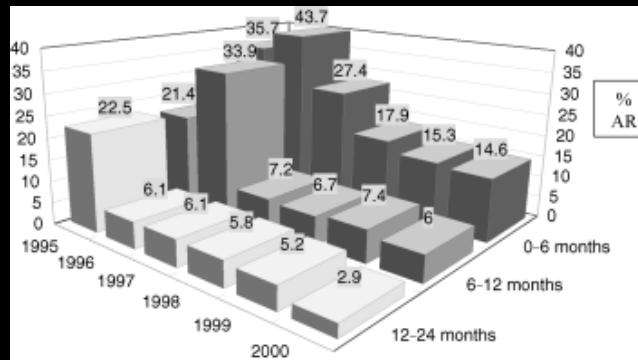
## RESULTS: Immunosuppressive drugs

20 of 22 pts received triple immunosuppression:

- Calcineurin Inhibitor:
  - Cyclosporine (CSA) 81.8% (18 pts)
  - Tacrolimus (FK) 18.2% (4 pts)
- Anti-Proliferative Agent:
  - MMF 68.2% (15 pts)
  - AZA 22.7% (5 pts)
- Glucocorticoids: 100% (22)

No acute rejection episodes in 68.2% (15 of 22 pts)

## Incidence of acute rejection episodes by era



- USRDS 2005

Time post-op	# Pts	% Acute Rejection
0 - 6 months	6	31.8%
6 - 12 months	1	4.5%
12 - 24 months	1	4.5%

## RESULTS: Post-op Infections

- 63.6% (14 pts) had major infectious complications
- 13.6% (3 pts) had an invasive fungal infection with 100% mortality

<b>Pyelonephritis, Urosepsis</b>	45.5% 10 pts	E. Coli, Enterococcus, Pseudomonas	0 - 21 months 3 pts rec. MDR E. Coli
<b>CMV</b>	18.2% 4 pts	CMV colitis CMV viraemia (3)	< 6 months 1 pt rec. gancyclovir-res
<b>Septic shock</b>	18.2% 4 pts	Group B Strep Disseminated Aspergillus Pseudomonas, E. Coli, Aspergillus wound infection Pseudomonas pneumonia	< 6 months
<b>Disseminated Fungal Infections</b>	13.6% 3 pts	Aspergillus (cerebral, lung) (3) P. Boydei (MTP joint) L. Theobromaes (osteomyelitis)	2-16 months 1 pt had nephrectomy All 3 pts died
<b>TB</b>	18.2% 4 pts	Pulmonary TB (2) +ve PPD (2)	< 1 month

## RESULTS: Other infections

- |   |       |  |
|---|-------|--|
| • Wound/perirenal abscesses                     | 3 pts | Pseudomonas<br>E. Coli<br>Aspergillus<br>S. Aureus |
| • Pneumonia                                     | 3 pts | Pseudomonas,<br>Parainfluenzae                     |
| • Paraspinal/psoas abscess and L3 osteomyelitis | 1 pt  | Pseudomonas  |
| • Oral ulcers                                   | 1 pt  | HSV, Candida                                       |

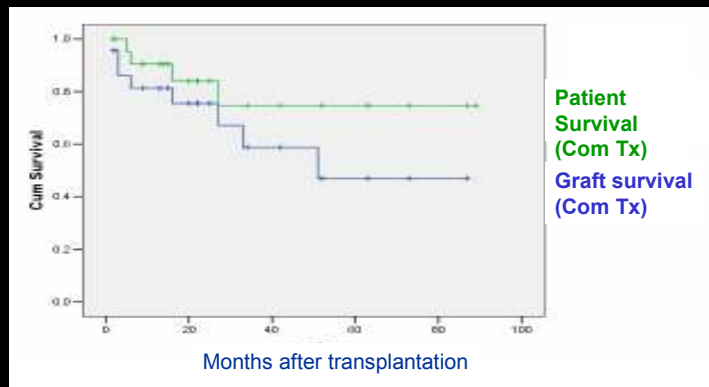
## RESULTS: Surgical complications

- 54.5% had urological complications (12 pts):
  - Wound infection (4)
  - Perirenal infection (2)
  - Lymphocele drained
  - Urinary leak from transplant ureter
  - Transplant ureteral obstruction (stone)
  - Incisional hernia
  - Post-op ileus
  - Gross hematuria with clots
  - Eosinophilic cystitis

## RESULTS: Surgical complications

- Urologic procedures in 31.8%
  - Stent removal (3)
  - Drainage of perirenal fluid collection (3)
  - Cysto and bladder fulguration
  - Inguinal hernia repair
  - PNL
  - Debridement of wound (4)
  - Tx nephrectomy (4)
    - 2 months (presumed early graft thrombosis)
    - 3 months (perirenal abscesses)
    - 3 months (infected ureteral leak)
    - 37 months (chronic rejection)

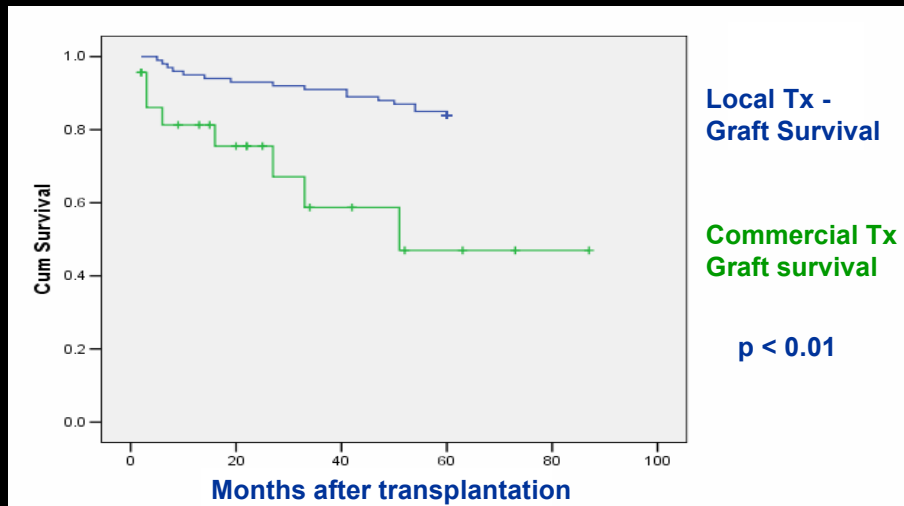
## Patient- and Graft- Survival in Commercial Transplant Recipients at SMH



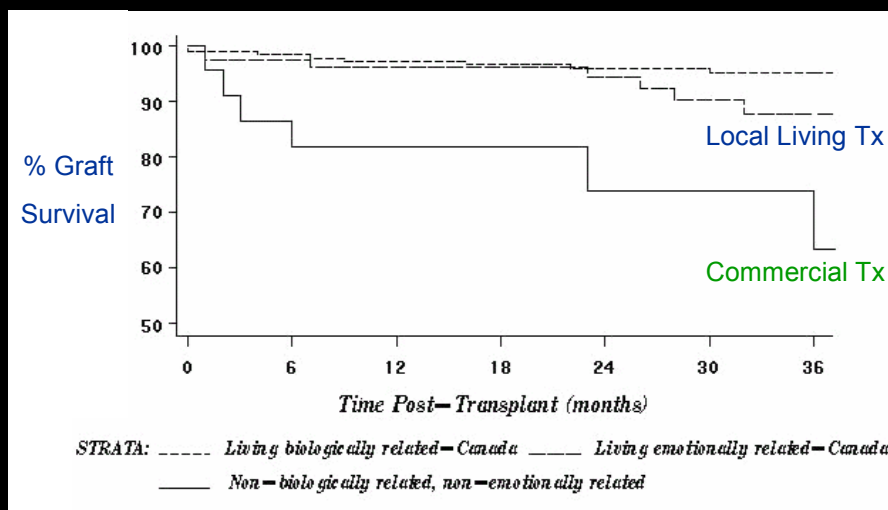
4 Deaths:  
 Disseminated Aspergillus (5, 6, 16 mos)  
 Metastatic Ca (27mos)

Allograft Loss = 8:  
 1. Graft thrombosis (2 mos)  
 2. Tx Nx: sloughed ureter, E. Coli infection (3 mos)  
 3. Tx Nx: perirenal abscesses (3 mos)  
 4. Chronic rejection (non-compliance) (33 mos)  
 5. MPGN and CHF (51 mos)  
 6. 3 deaths with functioning graft

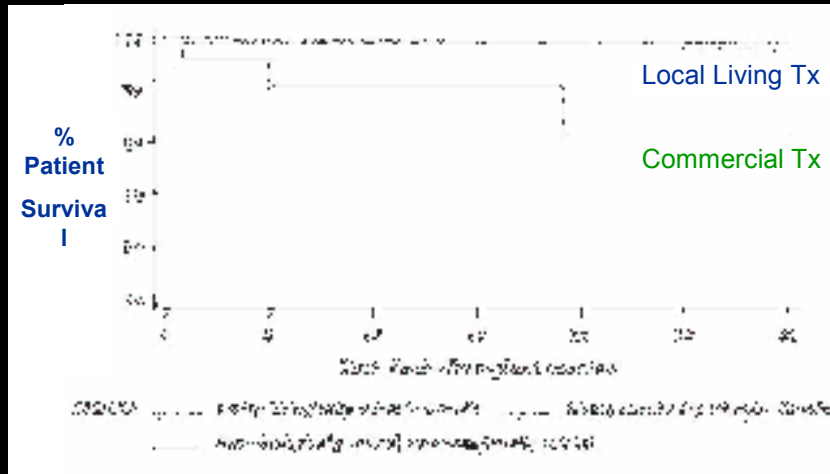
## Graft Survival in Commercial Transplant Recipients and Local Living-Donor Transplant Recipients



## Graft Survival: Commercial transplant recipients vs. local living biologically- and emotionally-related recipients

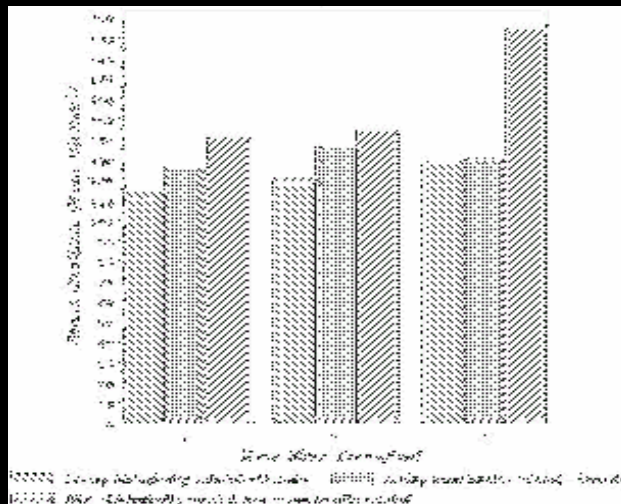


**Patient Survival: Commercial transplant recipients vs. local living biologically- and emotionally-related recipients**



**Graft function in Commercial Transplant Recipients:**

- 13 (56.5%) Tx surviving with good graft function (Cr  $\leq$ 130  $\mu$ mol/L)
- 2 Tx chronic graft insufficiency

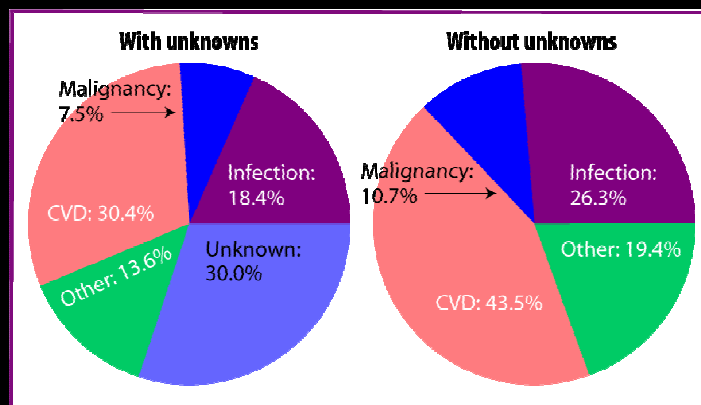




## Summary of Our Experience with Commercial Transplant Recipients

- **Severe systemic infections common and resulted in 3 deaths**
  - Pyelonephritis 46%
  - Systemic bacterial sepsis 23%
  - Systemic fungal infection 18%
  - CMV 18%
  - TB 18%
- **High acute rejection rate (32%) despite use of modern IS**
- **Surgical complications very common (55%)**
- **Poor 1-year and 3-year graft-survival (81% and 59%) and patient-survival (91% and 75%)**

## Overall cause-specific mortality after Tx



1. Cardiovascular disease (CVA, MI, arrhythmias)
2. Infection
3. Malignancy

- USRDS 2005 (N = 10,648 first-time renal Tx)

## Fungal infections after renal Tx ~ 5%

- Aspergillus sp
  - Invasive 0.7%, mortality ~ 75%
  - Risk factors
    - CMV, AR, steroids, OKT3, neutropenia
    - Hospital construction, nosocomial endemics
  - Prevention = ↓ spore counts in ambient air
  - First line treatment: Ampho B +/- surgical excision

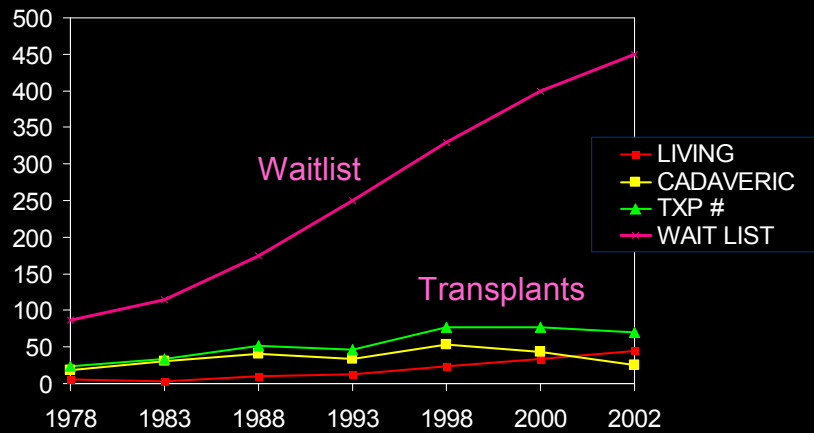
– Patterson, *Transpl Infec Dis* 1999

## Motivation to purchase a kidney abroad?

1. No local living donors
2. Faster transplantation to improve survival

## Motivation to purchase a kidney abroad....

### St. Michael's Hospital Transplant Activity



## Motivation to purchase a kidney abroad....

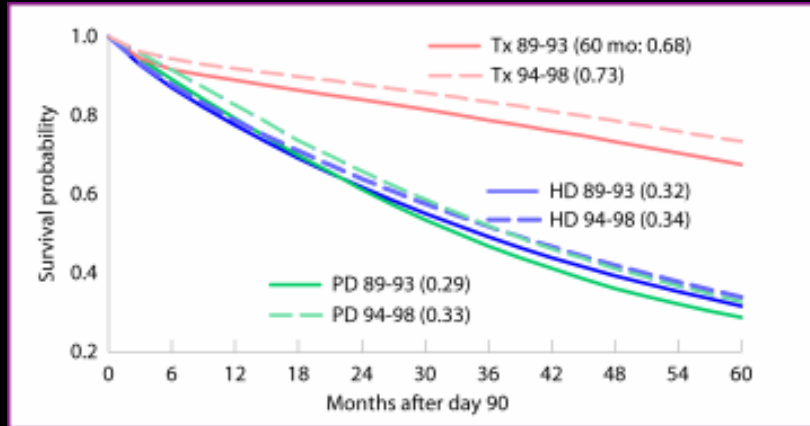
Average waiting times for adult cadaveric kidney in Toronto:

- 1981 : 6-12 months
- 1986 : 12-24 months
- 1991 : 15-36 months
- 1996 : 24-55 months
- 2000 : 36-72 months
- 2002 : 48- 96 months
- **2004 : 60-120 months**

TGOL 2004

## Motivation to purchase a kidney abroad....

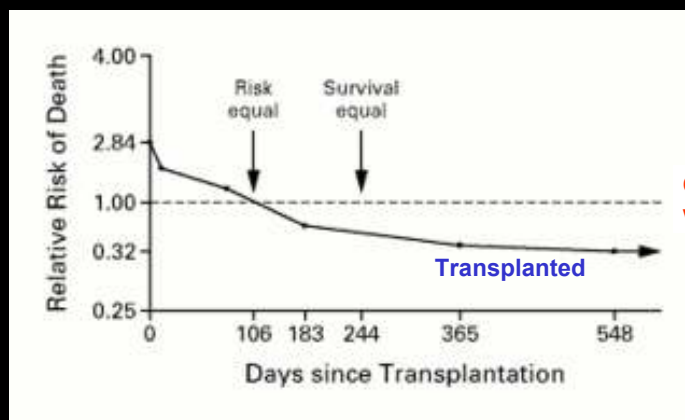
### “Death while waiting”



- USRDS 2005

## Motivation to purchase a kidney abroad....

### “Death while waiting”



On dialysis waiting for kidney

Wolfe, R. A. et al. N Engl J Med 1999

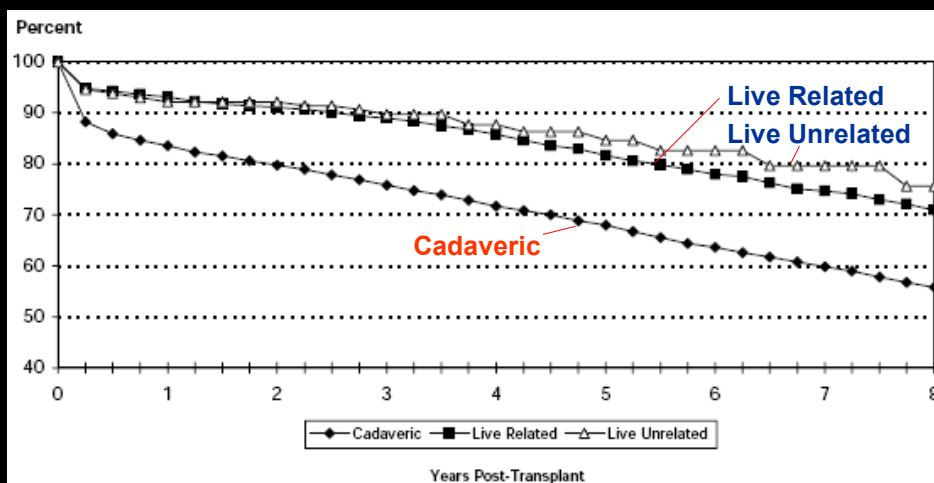


## Motivation to purchase a kidney abroad?

1. No local living donors
2. Faster transplantation to improve survival
3. Improved living donor graft- and patient-survival

## Motivation to purchase a kidney abroad....

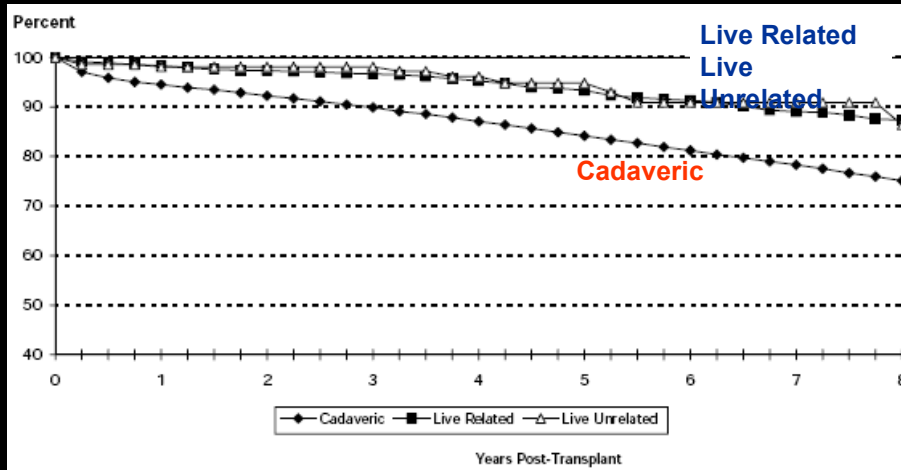
### Graft Survival by Donor Type (1981 – 1999)



- CORR (Canadian Organ Replacement Register) 2001

## Motivation to purchase a kidney abroad....

### Patient Survival by Donor Type (1981 – 1999)



- CORR (Canadian Organ Replacement Register) 2001

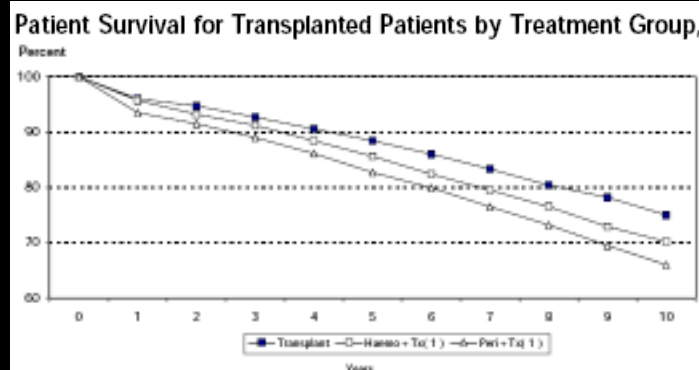
## Motivation to purchase a kidney abroad?

1. No local living donors
2. Faster transplantation to improve survival
3. Improved living donor graft- and patient-survival
4. **Desire preemptive transplant**

## Motivation to purchase a kidney abroad....

### Timing:

- Preemptive transplant can improve outcomes
- Usually not possible with cadaveric donors



- CORR (Canadian Organ Replacement Register) 2001

## Results from Commercial Transplant Series

Country of origin	N	Tx country	1 yr graft survival	1 yr pt survival	Complications
Australia 2005	16	India, Iraq, China	66%	85%	↑ HBV Aspergillus
Turkey 2001	115	India, Iraq, Iran	84% (2yr) p = 0.04	90% (2yr) p = NS	↑surgical (3 non-function) ↑opportunistic (malaria, 4% fatal invasive fungi, HBV 6%)
Tunisia 2001	20	Iraq, Egypt, Pakistan	85% (3yr)	93% (3yr)	↑ infections, surgical Cx, AR
Malaysia 2000	515	Not published	-	92%	↑ HBV 12%
Israel 1997	540	India	90% p = NS	96% p = NS	↑ HIV 4.6% ↑ HBV 8.1% ↓ graft survival if AR (p < 0.01)
	1206		66 - 90%	85 - 96%	

CORR (1981-1999) = 92% 98%

## Ethical debate

### Justification:

1. Life-saving option when no other exists, helps poor donors overcome extreme poverty
2. Patient autonomy
3. Health risk to donor minimal

### Criticism:

1. Exploitation of poor, poverty maintained
2. Prevents establishment of cadaveric Tx program
3. Not patient autonomy, but acts of desperation
4. Moneylenders demand kidney sale for debt payment, middleman keeps large portion of payment

## Economic and health consequences to selling a kidney in India. - Goyal, JAMA 2002

- Survey in 2001 of 305 pts who sold a kidney in India:
- Reason: 96% to pay off debts
- Average received: \$1070 (debt, food, clothing)
- Family income declined 1/3 after Nx ( $p < 0.01$ )
- 75% still in debt
- 89% deterioration in health
- 79% not recommend others sell their kidney



## Ethical issues

### What do we tell patients?

1. Not ethical, not condoned, illegal in Canada
2. Health risks: infection, avoid certain countries, obtain documents
3. Will manage patients upon return
4. Options

## How do you buy a kidney?

- **Internet:** <http://www.yeson.com.tw>, <http://www.liver4you.org>
- **Private kidney transplant brokerage agencies**
  - India, Middle East, E. Europe, S. America, S. Africa, Philippines
  - China - 90% executed prisoners
  - Illegal in India since 1994 – 60% still paid donors
  - Donors receive ~ \$500 – \$1000
- **Cost \$7,000 - \$200,000**
  - Private charities
  - Israel government refund veterans \$40,000

Evaluation for transplant



Transplant in as little as ten days

**Liver Transplant for \$100,000. Kidney transplants from \$35,000. to \$70,000. Do you want our help to get a transplant quickly ?**

## Conclusions

- “Unethical” & “illegal” labels are not effective deterrents
- Transplants at sub-optimal centers result in increased patient morbidity & mortality
- “Kidney shopping” by Canadians is a largely unrecognized but growing ethical issue
- Transplant community & society at large need to pay urgent attention to this important issue