



# Transplantation

Jason Ali

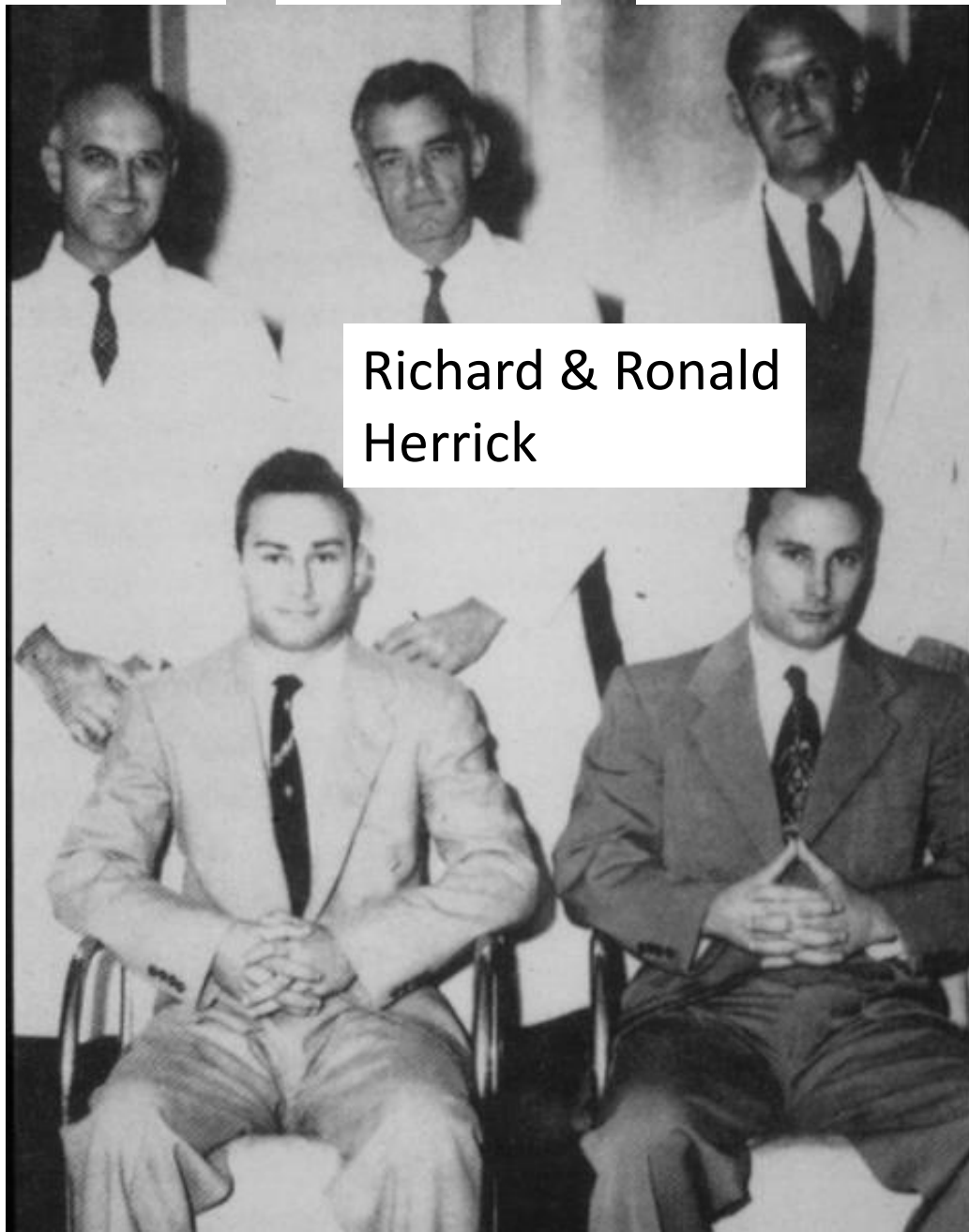
Academic Clinical Fellow

Transplant Surgery

Joe Murray

John Merrill

Hartwell Harrison



Richard & Ronald  
Herrick

Twin  
transplant  
1954  
Boston

# Solid Organ Transplantation



- Thoracic
  - Heart
  - Single or double lung
  - Heart/lung block
- Abdominal
  - Liver
  - Kidney
  - Pancreas
  - Small bowel

# Addenbrookes Hospital



- Regional multi-organ transplant centre
- Kidney Transplants – 150 per year
- Liver Transplants – 75 per year
- Pancreas Transplants – 50 per year
- Small Bowel Transplants -

# Kidney Transplantation

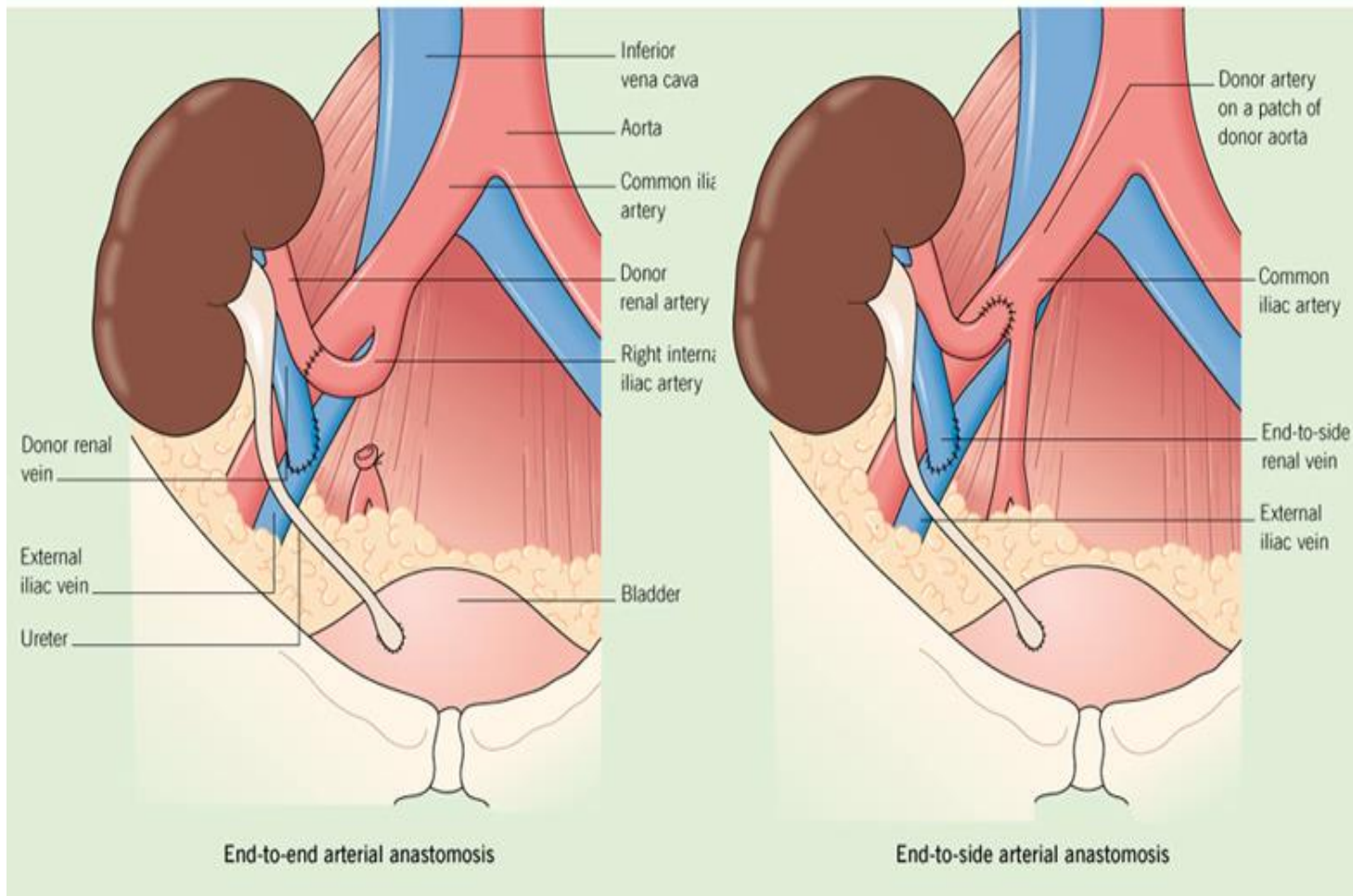


- Causes of end stage renal failure:
  - Hypertension
  - Diabetes
  - Glomerulonephritis
- Alternatives?
  - Medical management
  - Dialysis

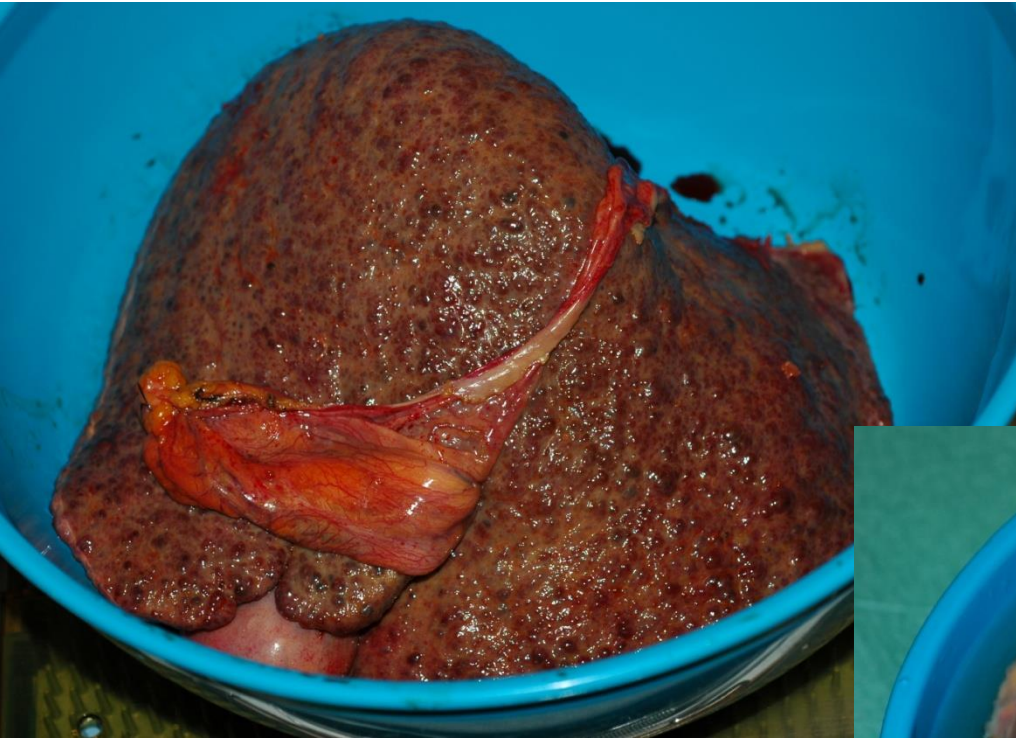
# Kidney Transplantation



## RENAL TRANSPLANT PROCEDURE



# Liver Transplantation



# Liver Transplantation



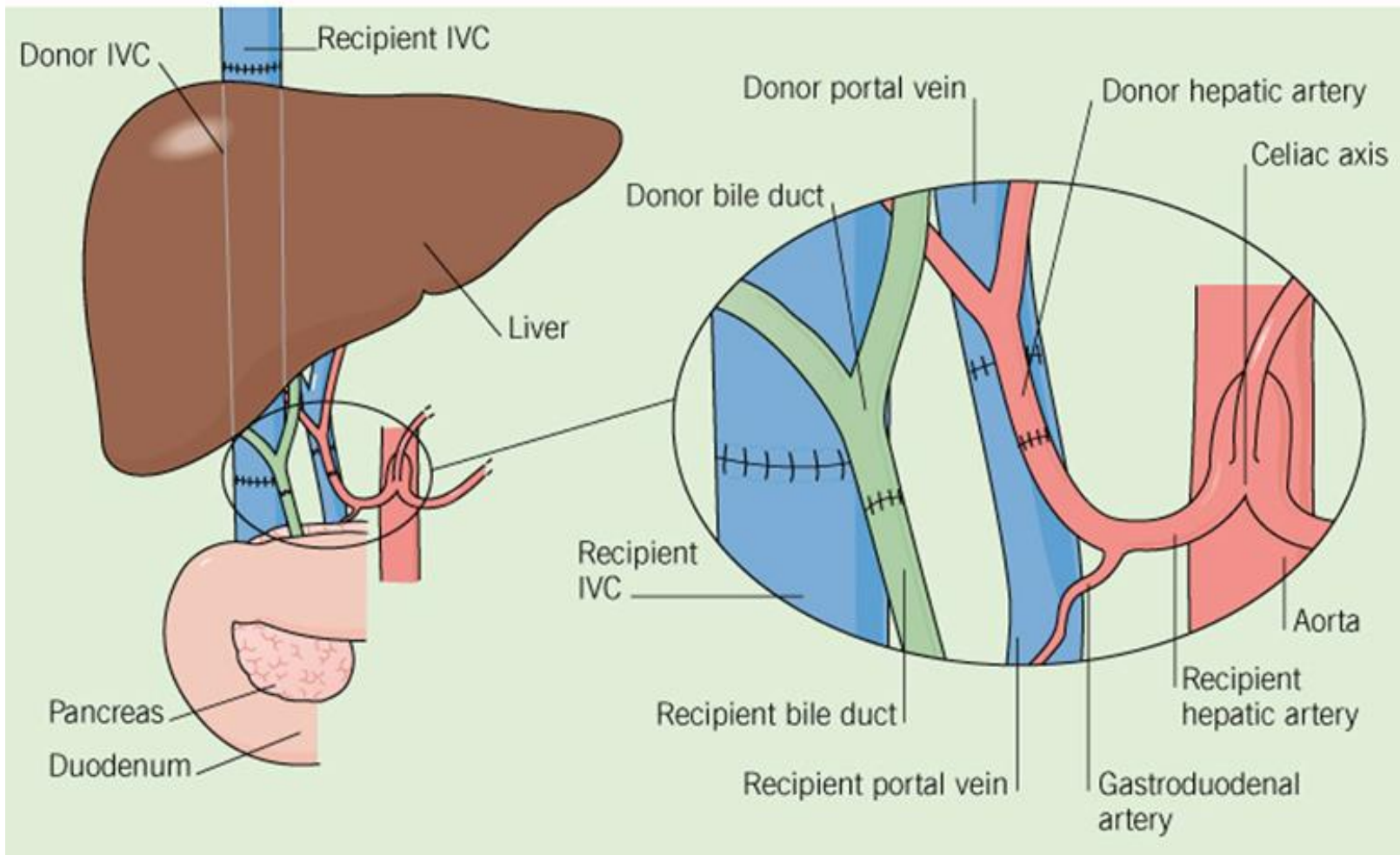
- Causes of liver failure
  - Alcohol
  - Hepatitis B and C
  - Non-alcoholic fatty liver disease
  - Hepatocellular carcinoma
  - Metabolic diseases
  - Acute liver failure (e.g. paracetamol)
- Alternatives?
  - None



# Liver Transplantation



## COMPLETION OF THE ANASTOMOSES



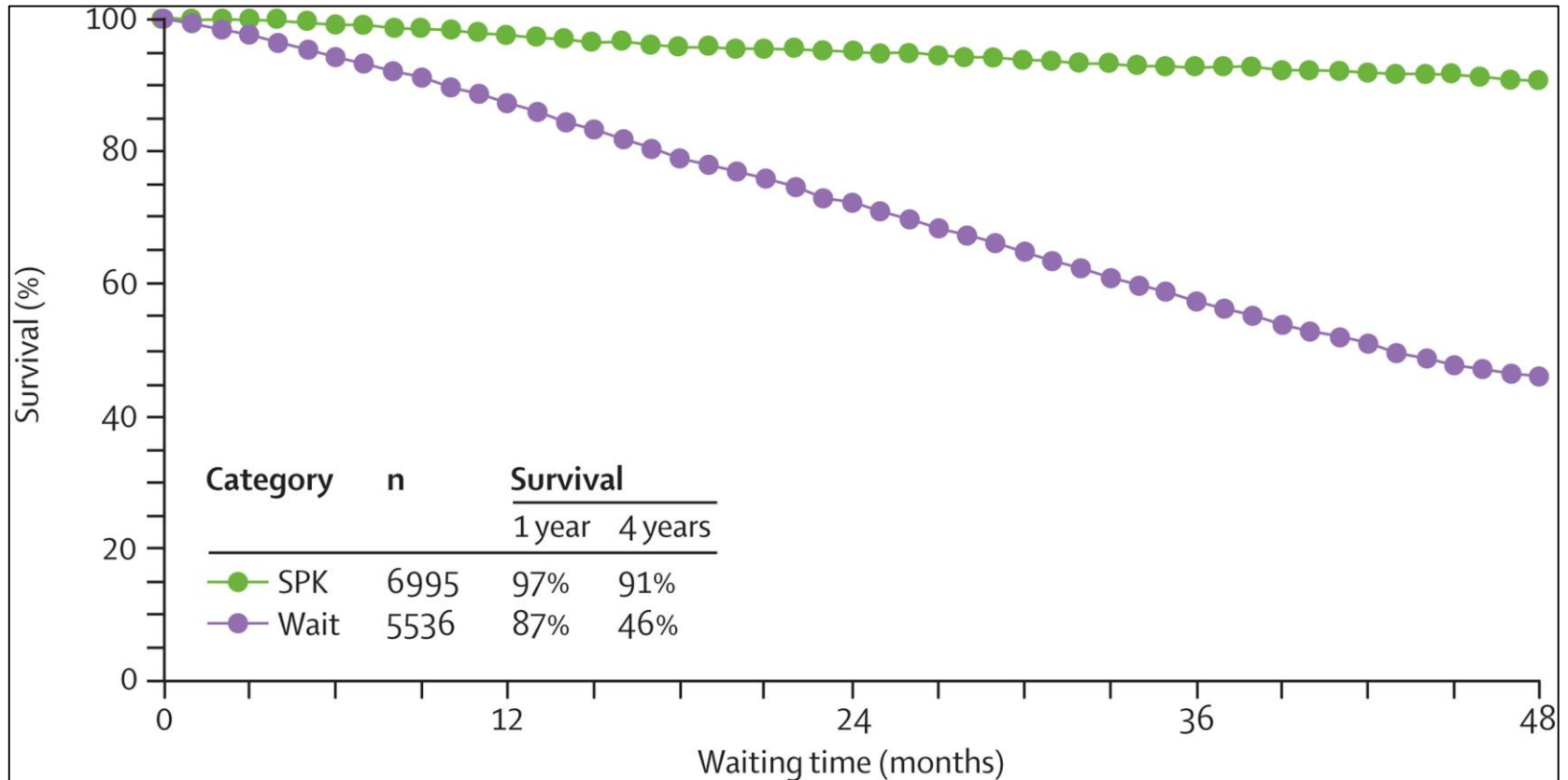
# Pancreas Transplantation



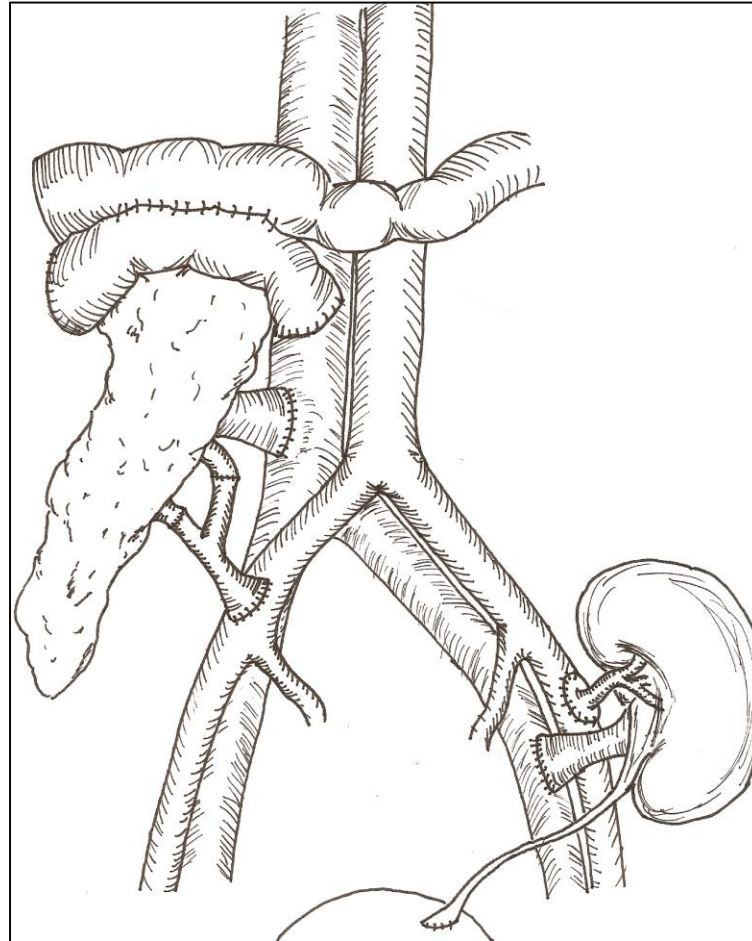
- Usually performed as a simultaneous kidney and pancreas transplant.
- For diabetic patients with diabetic nephropathy



# SPK Transplantation



# SPK Transplantation



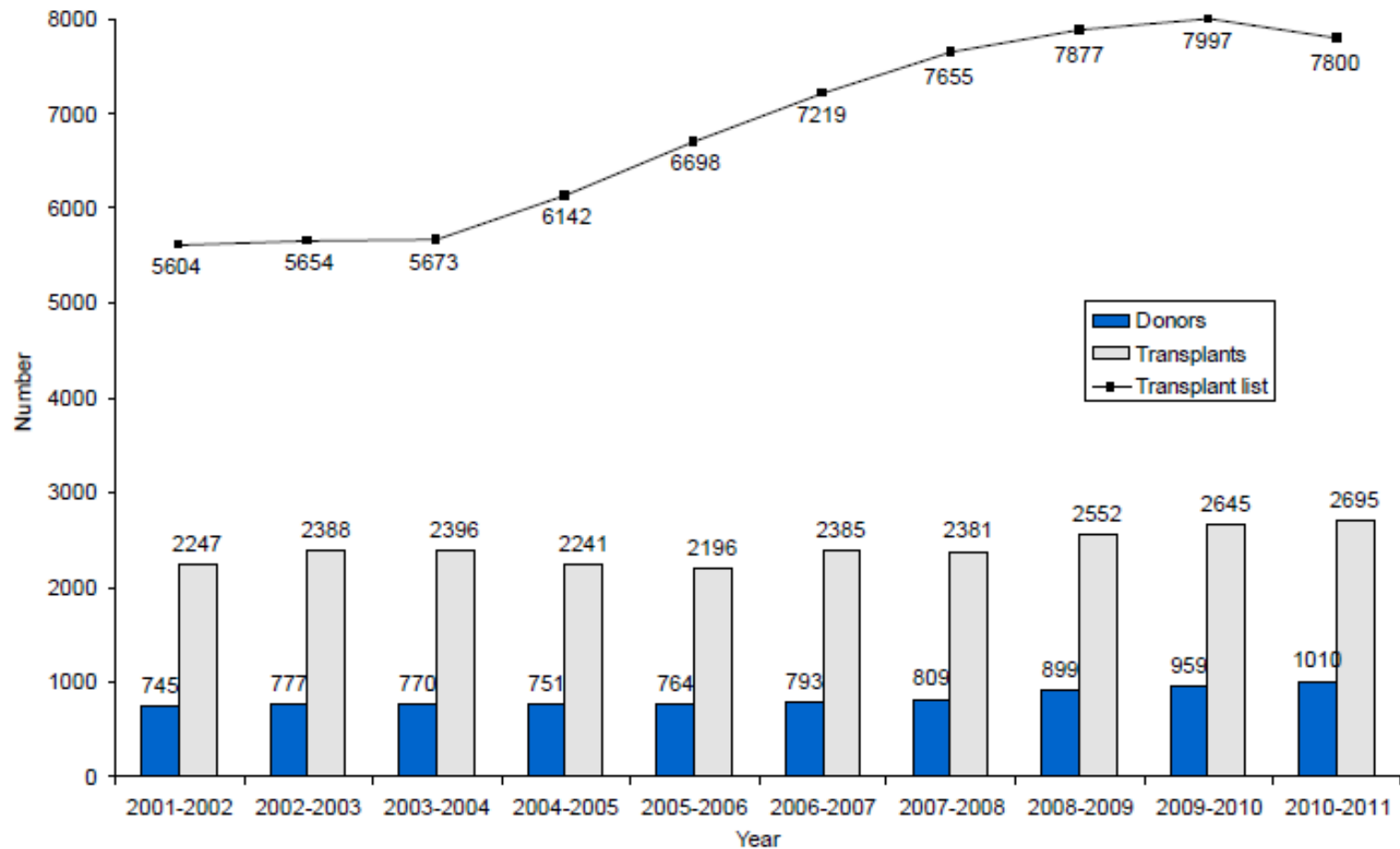


**Lack of organs is the single most important problem in transplantation**



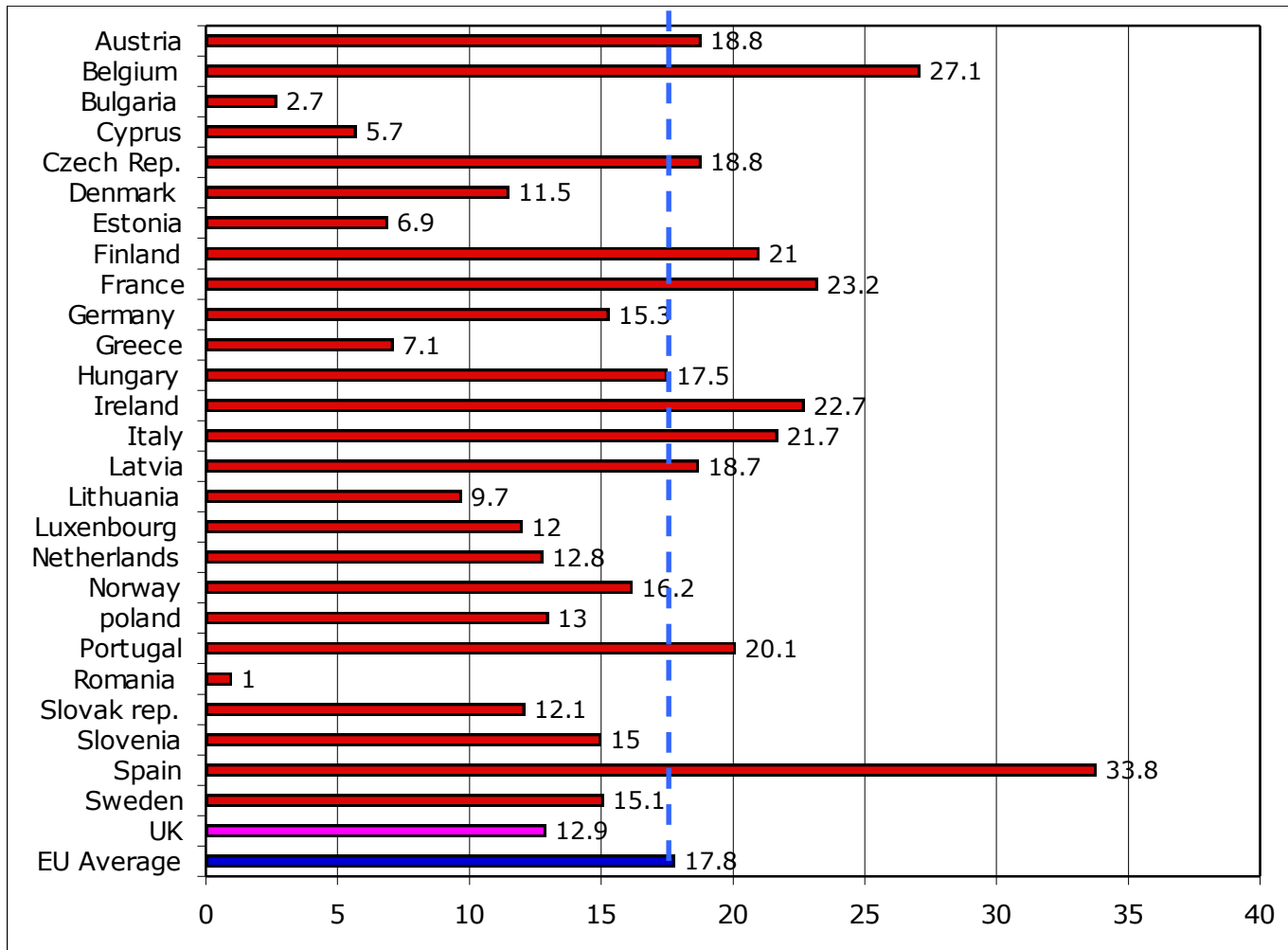
# Organ Donation

**Figure 2.1** Number of deceased donors and transplants in the UK, 1 April 2001 - 31 March 2011, and patients on the active transplant lists at 31 March





# Deceased organ donor rates



(Council of Europe 2007)



# Donor types

- Cadaveric donor
  - Donation after brain (stem) death (DBD)
  - Donation after circulatory death (DCD)
- Live donor



# Donation after brain death



- Preconditions

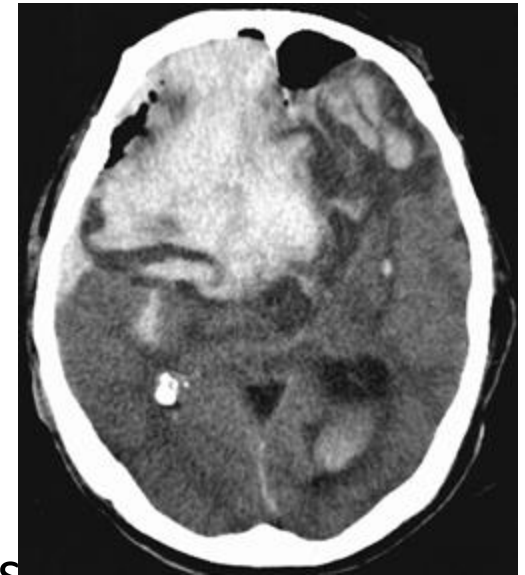
- Identifiable pathology causing irremediable damage
- Apnoeic coma

- Exclusions

- Hypothermia, drugs, endocrine disorders

- Clinical testing

- Absent brain stem reflexes
- Persistent apnoea



# Donation after circulatory death

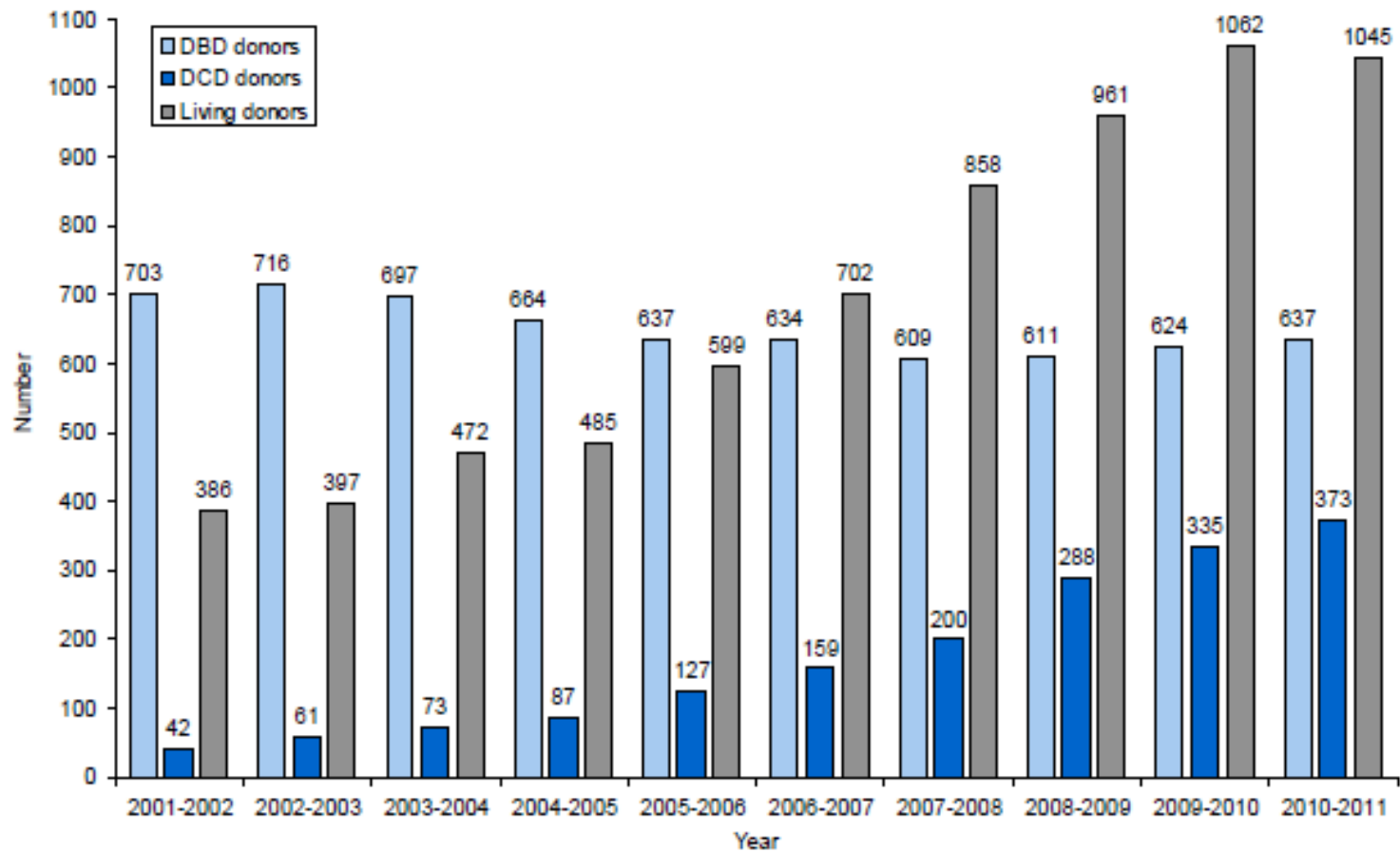


- Death declared on ‘standard’ criteria
  - Absent heart sounds, no pulse, no breath sounds, no movement, fixed and dilated pupils
- Controlled donors
  - Further intervention deemed futile
  - Life supporting treatment withdrawn
  - Death certified
  - 5 minute ‘stand-off’ period before surgery



# Organ Donation

Figure 2.2 Number of deceased and living donors in the UK, 1 April 2001 - 31 March 2011



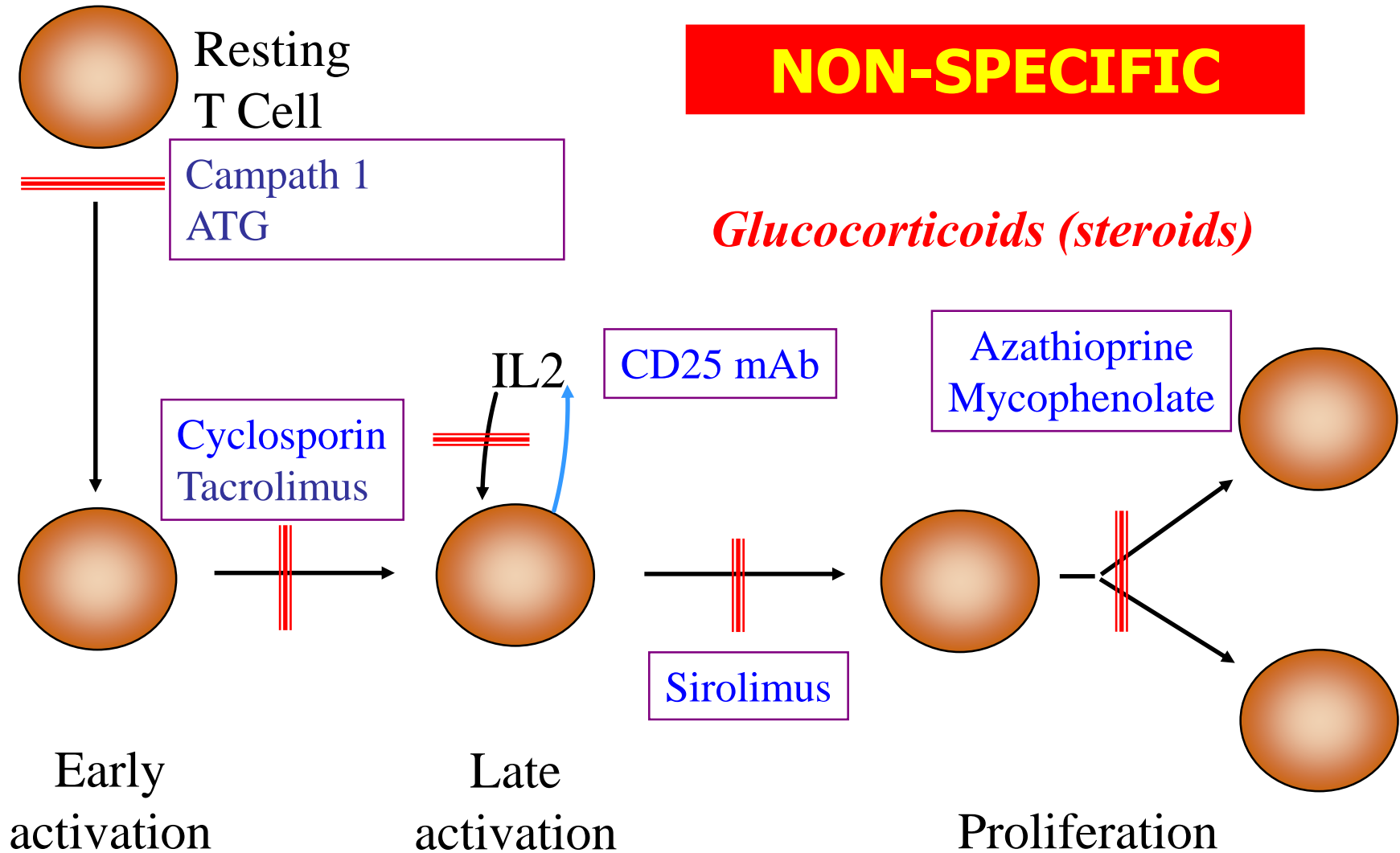
# Challenges of Transplantation



- REJECTION
- Classification based on
  - Time course
    - Hyperacute (within 12 hours)
    - Acute (within 6 months)
    - Chronic (after 6 months)
  - Mechanism
    - Cell-mediated
    - Humoral (Ab-mediated)



# Immunosuppression





# Side effects of immunosuppressant's

- Agent-specific
- Infection
- Malignancy



# Agent-specific side effects

## **Calcineurin inhibitors**

Nephrotoxicity  
Hypertension  
Diabetes  
Neurotoxicity  
Dyslipidaemia

## **mTOR inhibitors**

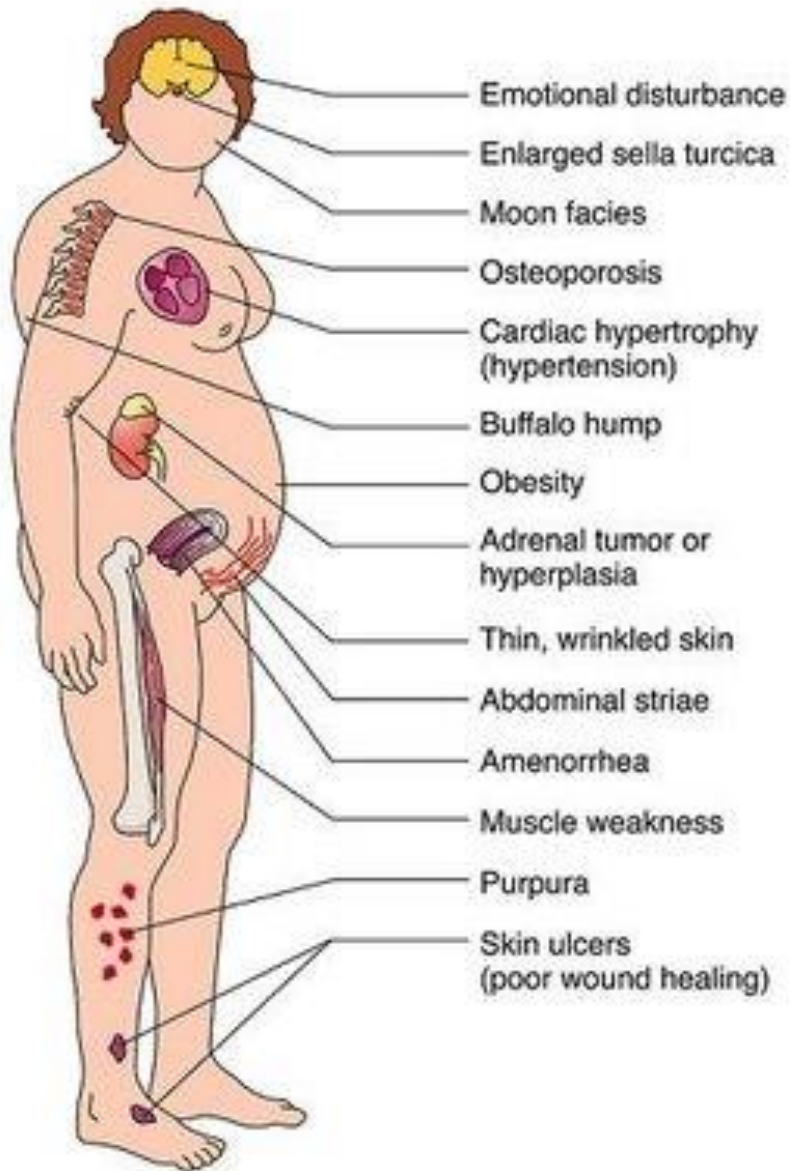
Skin disorder  
Bone problems  
Dyslipidaemia

## **Corticosteroids**

Hypertension  
Diabetes  
Weight gain  
Dyslipidaemia  
Osteoporosis

## **Antiproliferative Agents**

Gastrointestinal problems  
Haematological problems



Corticosteroid side effects  
≡ Cushing's syndrome





# Infections

< 1 month

1-6 months

>6 months

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## Nosocomial infections

Wound infection

Aspiration pneumonia

Catheter-related infection

Urinary infections

**Infection from previous colonisation** (eg MRSA)

**Infection from donor organ**

## Activation latent infection

CMV

BK virus

PCP

Herpesvirus

Adenovirus

TB

**Community-acquired infection**

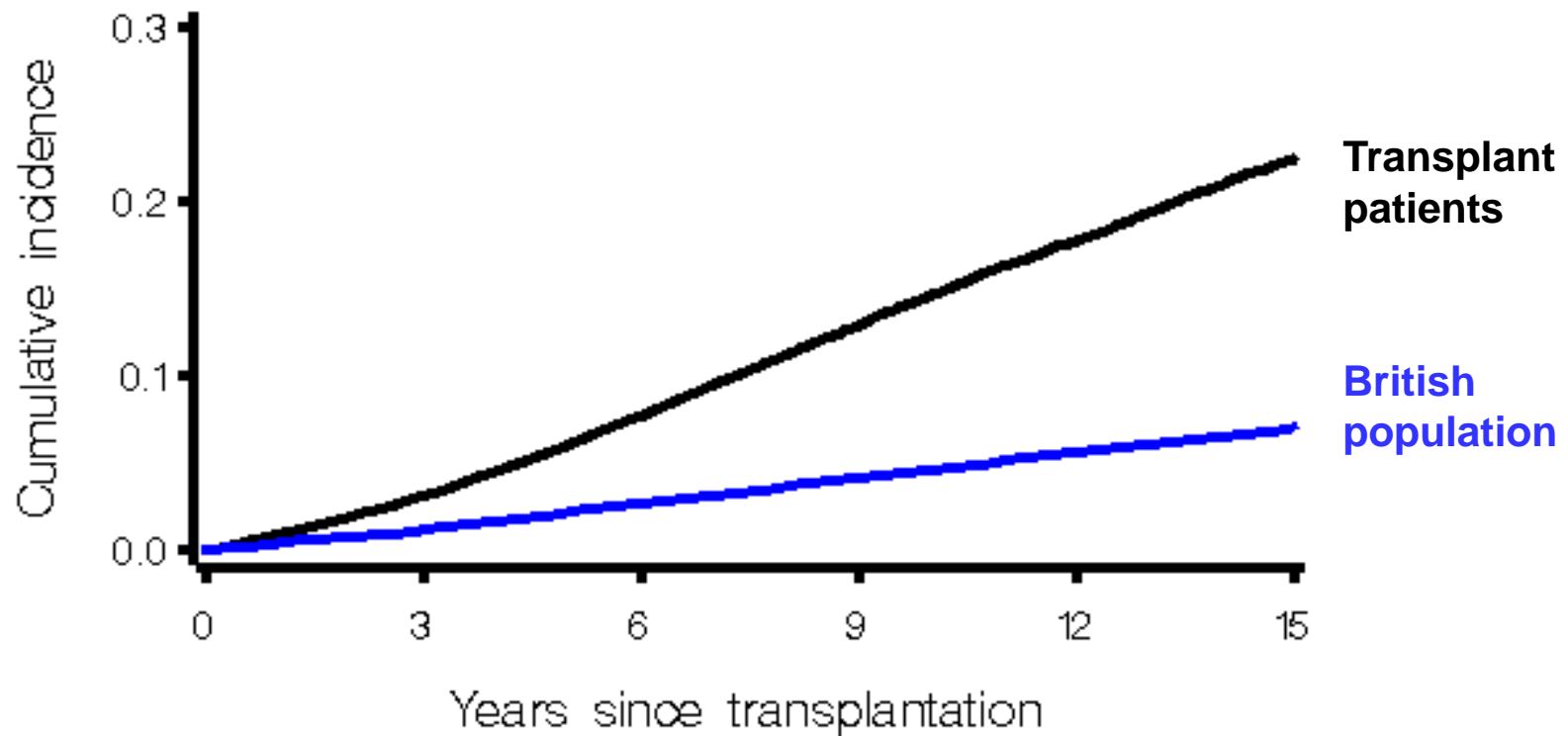
**Late viral infection**

CMV

EBV



# Cancer after transplantation





# Cancer after transplantation

- Skin cancers
  - Squamous cell carcinoma
- Post-transplant lymphoproliferative disorders (PTLD)
- Solid organ tumours
  - Bowel - Prostate
  - Breast - Pancreas
  - Lung





# Outcomes

- Liver, kidney, pancreas, heart
  - 10-year survival ~ 50%
- Lung, small bowel
  - 10-year survival ~ 30%
- Kidney transplantation vs dialysis
  - Cheaper
  - Better quality of life
  - Longer life

# Summary



- Improves quality of life
- Extends life
- Cost-effective (kidney transplantation)
- Donor scarcity is the critical issue
- Significant success, but with major side effects