

# Transplant recipient workup

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Renal STR training day

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# Transplantation®



## **KDIGO Clinical Practice Guideline on the Evaluation and Management of Candidates for Kidney Transplantation**

### **CLINICAL PRACTICE GUIDELINES**

#### **Assessment of the Potential Kidney Transplant Recipient**

**UK Renal Association**

**5<sup>th</sup> Edition, 2010**

**Final Draft 12.11.10**

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Posted at [www.renal.org/guidelines](http://www.renal.org/guidelines) September 2010

- Why?
- When?
- Who?
- Psychosocial assessment
- Adherence
- Surgical issues
- PRD
- Infection
- Cancer
- Heart
- HLA

# Why transplant?

Reduced risk of death

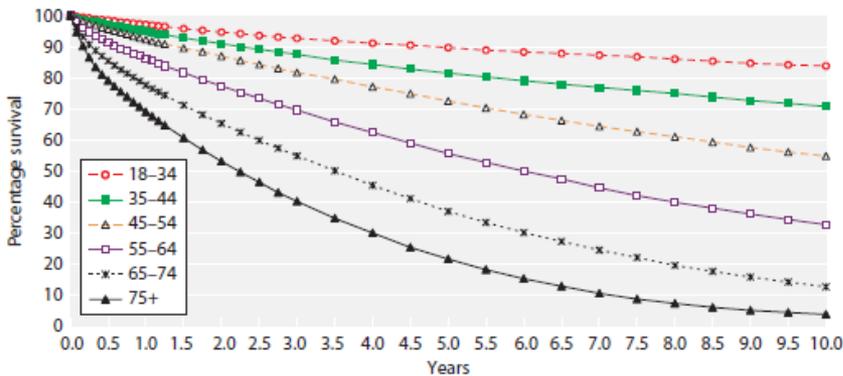
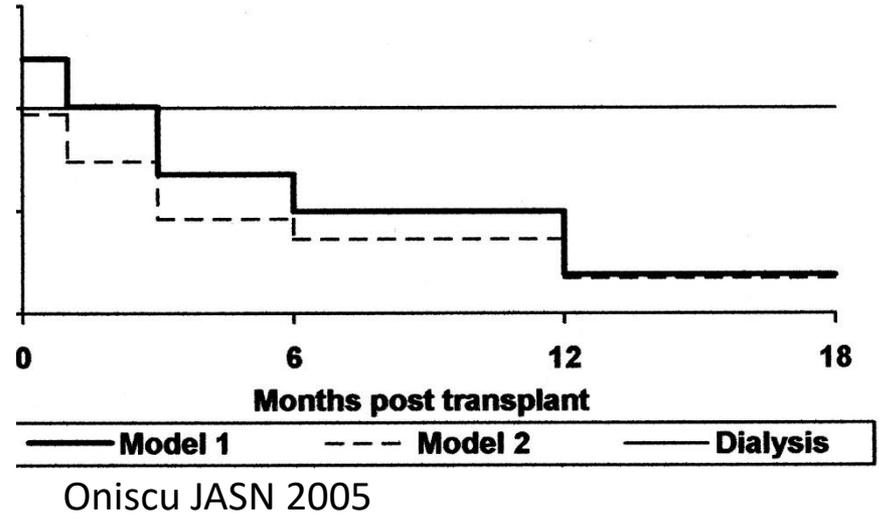
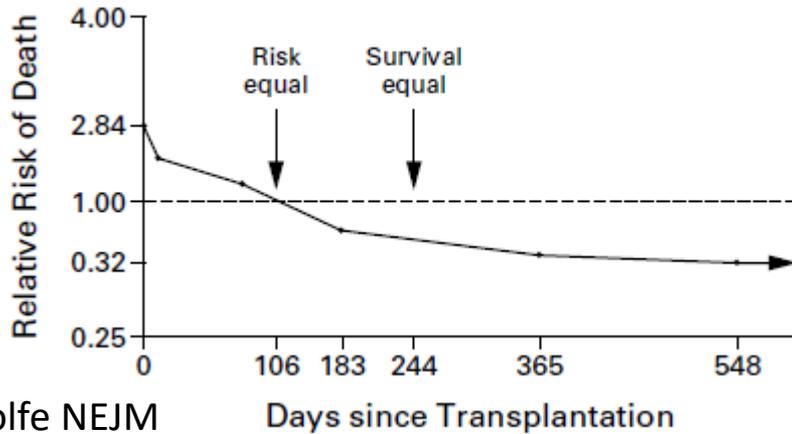


Fig. 5.4. Survival of incident RRT patients (unadjusted), 1997–2014 cohort (from day 0)

(cheaper)

Tx: 17K upfront then £5K/year  
Dialysis: £30k/year  
(old 2009 NHS England data)

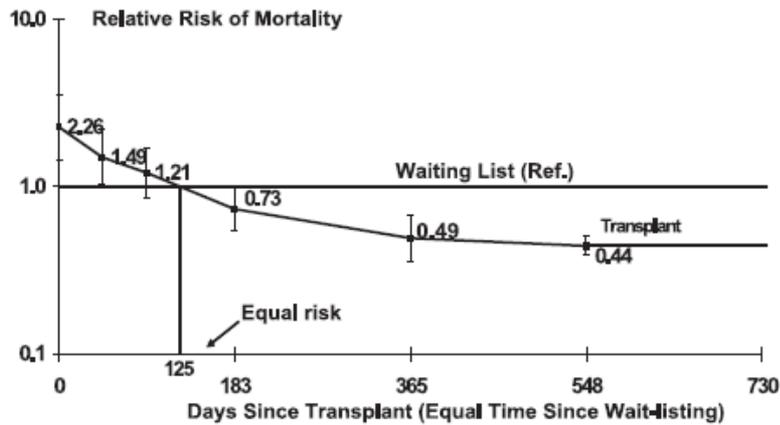
Improved QoL Laupacis, KI, 1996; Neipp, Transplantation 2006

# When to start working up?

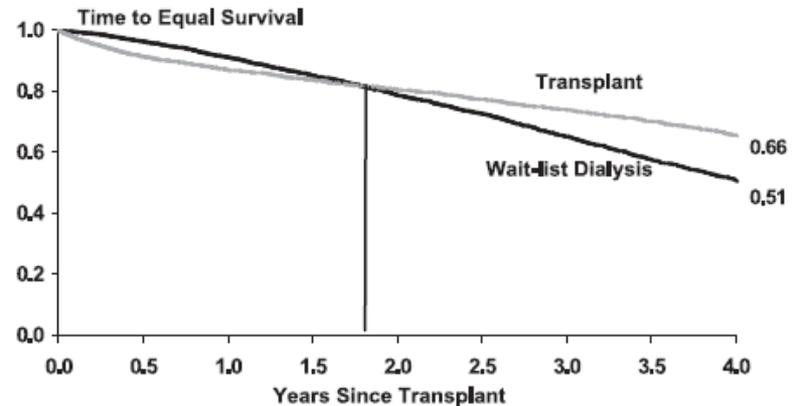
- KDIGO: 'At least 6-12 months before expected RRT'
- Renal association 'list within 6 months of expected RRT'
- Common sense: 'early enough to get it all done in time for the best treatment':
  - Pre-emptive>post-dialysis
  - Living donor>deceased-donor

# Who to work up?

- Risk vs benefit
- 'Age alone not a contraindication'



**FIGURE 1.** Mortality RR (95% CI) for 2078 first deceased donor kidney transplant recipients versus 5667 wait-listed dialysis patients older than 70 years of age.



**FIGURE 2.** Cumulative survival curves for elderly deceased donor transplant recipients and elderly wait-listed dialysis patients.

# Psychosocial

- Evaluation recommended 'by a healthcare professional' (KDIGO)
- No clear evidence (RCTs needed):
  - Pre-transplant psychosocial issues may not predict post-transplant ones
- A way of identifying need for support

# Predicting adherence to treatment

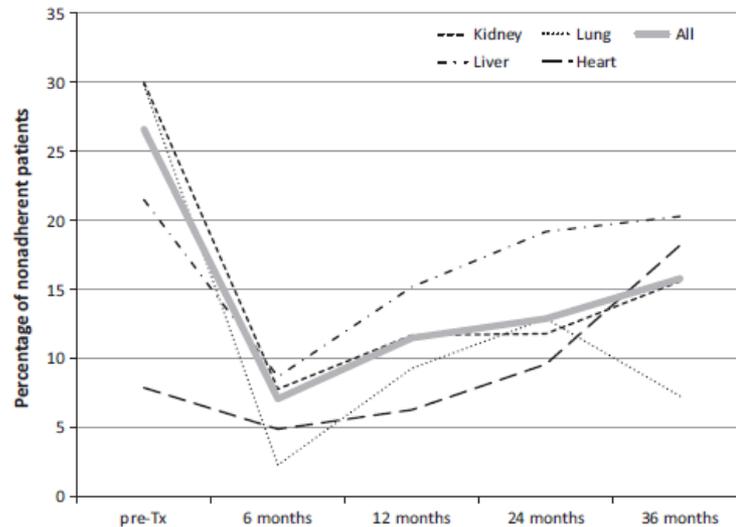


Figure 2 Evolution of medication nonadherence from pretransplant to 3 years post-transplant. Tx, transplantation.

De Geest, Transplant International, 2014

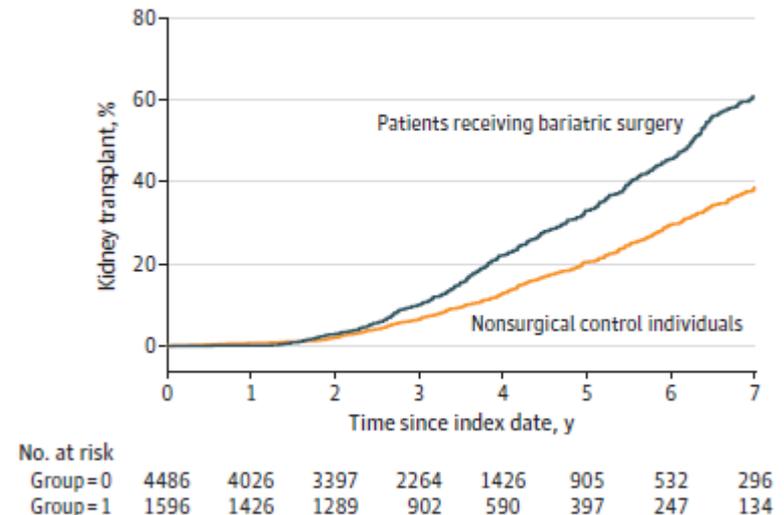
ifference over time and across differe

Contrast	Prediction of post-Tx nonadherence by pre-Tx nonadherence ( $n = 1166$ ) <sup>§</sup>	
	Adjusted odds ratio (95% Confidence limit)	<i>P</i>
Pre-Tx versus month 6*	3.10 (2.29–4.21)	<0.0001
Month 12 versus month 6	1.69 (1.27–2.25)	0.0003
Month 24 versus month 6	1.15 (1.59–2.92)	<0.0001
Month 36 versus month 6	2.89 (2.05–4.08)	<0.0001

# Surgical issues

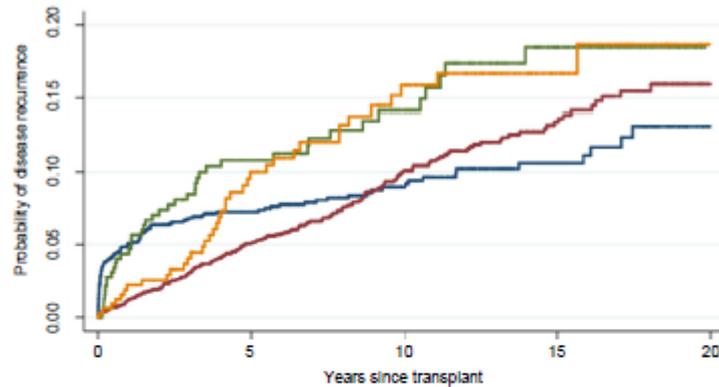
- PVD: need iliac vessel imaging
- Bladder issues – reflux, small bladder, conduit – urology input, flow studies, plan for post-op catheters etc
- Big polycystic kidneys?
- No DOACs
- Obesity (BMI?)
  - Robotically-assisted?
  - Bariatric surgery?

D Cumulative incidence of kidney transplant



# Primary disease: GN

Will it come back?

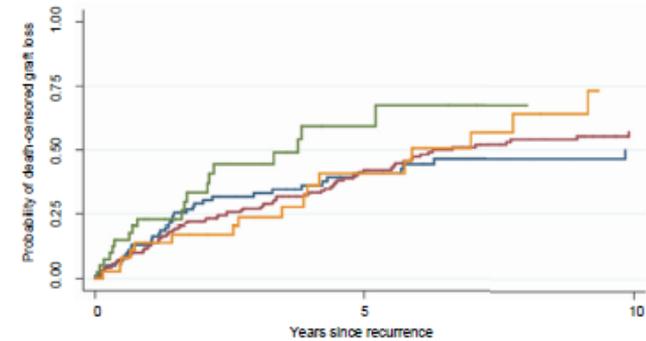


Number at risk					
	0	5	10	15	20
FSGS	1653	769	412	194	67
IgA nephropathy	2451	1543	836	365	115
MPGN	352	201	122	63	35
Membranous	340	194	121	51	13

<span style="color: blue;">—</span> FSGS	<span style="color: red;">—</span> IgA nephropathy
<span style="color: green;">—</span> MPGN	<span style="color: orange;">—</span> Membranous GN

If it does, will my kidney fail?



Number at risk			
	0	5	10
FSGS	103	35	15
IgA nephropathy	195	70	26
MPGN	41	5	1
Membranous	37	13	2

<span style="color: blue;">—</span> FSGS	<span style="color: red;">—</span> IgA nephropathy
<span style="color: green;">—</span> MPGN	<span style="color: orange;">—</span> Membranous GN

MPGN worst for current graft if it recurs. FSGS bad for this one and the next one  
 IgA recurrence less damaging (still not great)

Never a reason not to do the first transplant, but need consent and monitoring

# Infection

## Screen

**TABLE 11.**

**Recommendations for initial and follow-up screening of viral and non-viral pathogens in kidney transplant candidates.**

Pathogen	Test	Repeat testing
<b>Viral infections</b>		
HIV	IgG	If negative, repeat annually and at time of transplant
HCV	IgG	If negative, repeat annually and at time of transplant
HBV	Anti-HBs, Anti-HBc, HBsAg	If negative, repeat annually and at time of transplant
CMV	IgG	If negative, repeat at time of transplant
EBV	VCA IgG or EBNA IgG	If negative, repeat at time of transplant
HSV	IgG	If negative, repeat at time of transplant
VZV	IgG	If negative, repeat at time of transplant and 4 weeks post-vaccination
Measles, Mumps, Rubella	IgG	If negative, repeat at time of transplant and 4 weeks post-vaccination
HTLV	IgG	None unless ongoing risk of exposure
<b>Non-Viral infections</b>		
Syphilis	IgG with confirmatory testing if IgG positive	None
Strongyloides	IgG	None
Chagas disease	IgG	None
Tuberculosis (in low prevalence areas)	Tuberculin skin test or Interferon-gamma release assay (IGRA)	Annually if ongoing risk of exposure
Malaria	Blood smear if clinically indicated	None

Anti-HBc, hepatitis B core antibody; Anti-HBs, hepatitis B surface antibody; CMV, cytomegalovirus; EBNA, EBV nuclear antigen; EBV, Epstein-Barr virus; HBV, hepatitis B virus; HBsAg, hepatitis B surface antigen; HCV, hepatitis C virus; HIV, human immunodeficiency virus; HSV, herpes simplex virus; HTLV, human T-lymphotropic virus; IgG, immunoglobulin G; VCA, viral capsid antigen; VZV, varicella zoster virus.

# Infection

Treat

HIV	Hep C	Hep B
Stable on ARV	Can transplant before treatment if needed (eg if LKD) (and not decompensated)	Stable on antiviral treatment and with hepatology follow-up

# Vaccinate

## Summary of routine vaccinations for kidney transplant candidates

Routine Vaccines	Dosing Guidelines*	Comment
<b>Inactive Vaccines</b>		
Diphtheria, Pertussis, Polio, Tetanus, Hib	Generally given in childhood; Ensure these are up-to-date	
Pneumococcal Vaccination: PCV13, PPV23	One dose of PCV13 followed by one dose of PPV23 with a minimum of 8-week interval in between	One booster of PPV23 five years from previous PPV23
Influenza	One dose annually	
Hepatitis B	Three doses at 0, 1, 6 months	Check anti-HBs titer Monitor annually and give booster dose if titers decline <10 IU/ml
<del>Hepatitis A</del>	<del>Two doses at 0, 2 months</del>	<del>Check titers, if not immune, give vaccination again (i.e., repeat if no response to first series)</del>
Human Papillomavirus	Three doses in both males and females if not previously given (ages 9 to 45)	No boosters
Meningococcal quadrivalent conjugate (Serogroups A,C,Y,W-135)	Two doses given 8 weeks apart; Indicated for travel to endemic areas, prior or planned splenectomy or planned use of eculizumab	Repeat one dose every five years in patients at risk
Meningococcal B vaccine	One dose if planned use of eculizumab	
Shingles (Herpes Zoster Subunit)	Two doses at 0, 2-6 months for those age ≥ 50 years and VZV IgG positive	Unknown if benefit in less than 50 years of age No boosters
<b>Live Vaccines</b>		
Measles, Mumps, Rubella	Two doses given 4 weeks apart. Considered immune after two doses regardless of seroconversion.	Check serology and provide vaccination if negative
Varicella	Two doses given 4 weeks apart. Considered immune after two doses regardless of seroconversion.	Check serology and provide vaccination if negative
Shingles (Herpes Zoster Live)**	One dose in those age ≥ 50 years and VZV IgG positive	Unknown if benefit in less than 50 years of age No boosters

\*Duration and doses are suggestive only as they may be variable in different regions. Please check your local guidelines.

\*\*The herpes zoster subunit inactivated vaccine is preferred over the herpes zoster live vaccine. If the herpes zoster live vaccine has already been administered, the transplant candidate can be reimmunized with the inactivated vaccine a minimum of one year after the live vaccine.

Anti-HBs, hepatitis B surface antibodies; Hib, hemophilus influenzae type b; IgG, immunoglobulin G; IU, international unit; PCV13, pneumococcal conjugate vaccine-13 valent; PPV23, pneumococcal

See also 'the green book' gov.uk for UK-specific guidance

# Cancer

## Active cancers

NO – except:

- prostate (gleason <7);
- Superficial non-melanoma skin cancer
- Small incidentally-detected RCCs <1cm

## Screening

KDIGO: All as per general population screening, except – CXR +

<b>Kidney</b>	<p><small>ence for screening and screening should stop at the age of 70</small></p> <ul style="list-style-type: none"><li>• Routine screening for renal cell cancer is not recommended for average risk individuals</li></ul>	<ul style="list-style-type: none"><li>• Ultrasonographic screening of the native kidneys may be recommended for individuals who have a family history of renal cancer, a personal history of acquired cystic disease, analgesic nephropathy, long-term smoking and/or prolonged waiting time on dialysis<sup>369</sup> (see Rec 11.1.2)</li></ul>
<b>Bladder</b>	<ul style="list-style-type: none"><li>• Routine screening for bladder cancer is not recommended for average risk individuals</li></ul>	<ul style="list-style-type: none"><li>• Urine cytology and cystoscopies may be recommended for individuals who had been previously exposed to chemotherapeutic agents such as cyclophosphamide, regular users of compound analgesics and for heavy smokers (<math>\geq 30</math> pack-year history) (see Rec 11.1.3)</li></ul>

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**TABLE 14.**

Recommended waiting times between cancer remission and kidney transplantation<sup>91</sup>

Breast	Early	At least 2 years
	Advanced	At least 5 years
Colorectal	Dukes A/B	At least 2 years
	Duke C	2-5 years
	Duke D	At least 5 years
	Bladder	Invasive
Kidney	Incidentaloma (< 3 cm)	No waiting time
	Early	At least 2 years
Uterine	Large and invasive	At least 5 years
	Localized	At least 2 years
	Invasive	At least 5 years
Cervical	Localized	At least 2 years
	Invasive	At least 5 years
Lung	Localized	2-5 years
Testicular	Localized	At least 2 years
	Invasive	2-5 years
Melanoma	Localized	At least 5 years
	Invasive	Contraindicated
Prostate	Gleason ≤6	No waiting time
	Gleason 7	At least 2 years
	Gleason 8-10	At least 5 years
Thyroid	Papillary/Follicular/	
	Medullary	
	Stage 1	No waiting time
	Stage 2	At least 2 years
Hodgkin Lymphoma	Stage 3	At least 5 years
	Stage 4	Contraindicated
	Anaplastic	Contraindicated
	Localized	At least 2 years
	Regional	3-5 years
Non-Hodgkin Lymphoma	Distant	At least 5 years
	Localized	At least 2 years
	Regional	3-5 years
Post-transplant lymphoproliferative disease	Distant	At least 5 years
	Nodal	At least 2 years
	Extranodal and cerebral	At least 5 years

# Previous cancers

Pre-transplant cancer, higher risk of:

- Mortality
- Cancer mortality
- New cancer

(Acuna, Transplantation 2017)

But, recurrence risk although 'high', may be outweighed by risk of ongoing non-transplanted ESRD

**Individualised, careful consent**

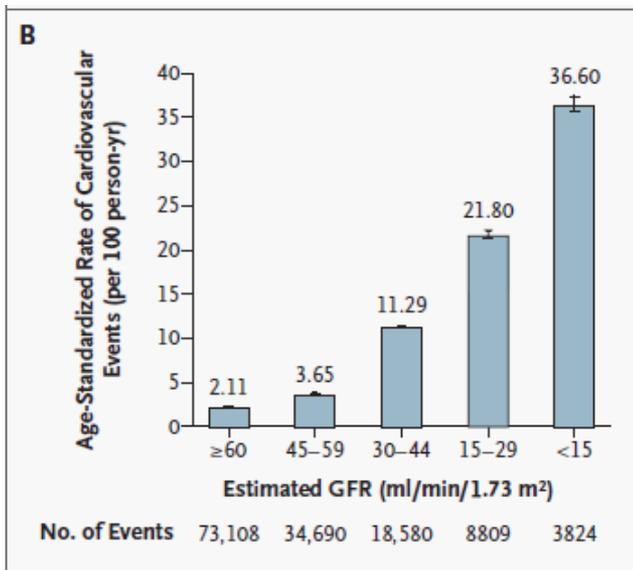
# Known heart disease

- See a cardiologist (KDIGO)
- No transplant if severe CAD or severe LVSD
- Known MI – see cardiologist, stable of secondary prevention, no clear guidance on time since event (though antiplatelet therapy may dictate)

# Screening for heart disease

More likely to have CAD,  
often asymptomatic

So, screen for CAD?



KDIGO:

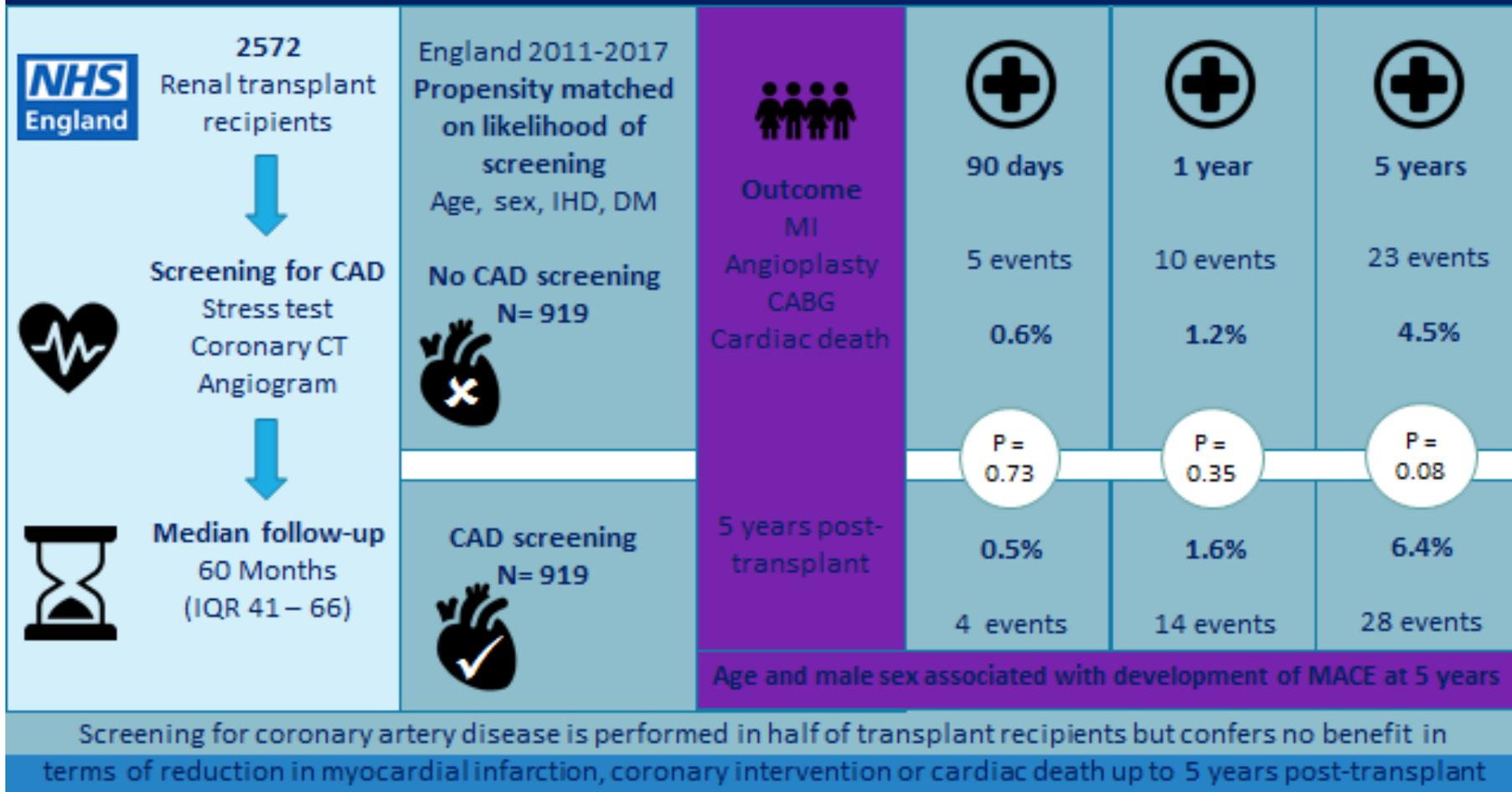
- Screen all with exam and ECG
- 'high risk' with non-invasive screening
- Echo if on list >2 years (for LVSD)

Bristol:

- >60 (was 50) or diabetes/FH/high risk/prev IHD – refer cardiology
- Tend to get treadmill or MPS then angio if abnormal

Go, NEJM 2004

# Effect of screening for asymptomatic coronary artery disease pre-transplantation on major adverse cardiac events



Nimmo, unpublished data

# Send blood for HLA typing

- Calculate matchability/CRF:
  - <https://www.odt.nhs.uk/transplantation/tools-policies-and-guidance/calculators/>
- Can use chance of transplant calculator to show likelihood of DD offers

- Why?
- When?
- Who?
- Psychosocial assessment
- Adherence
- Surgical issues (vascular, urology, weight)
- PRD
- Infection
- Cancer
- Heart
- HLA

'early enough to get it all done in time for the best treatment':

Pre-emptive > post-dialysis

Living donor > deceased-donor

Convince these people to do things quickly