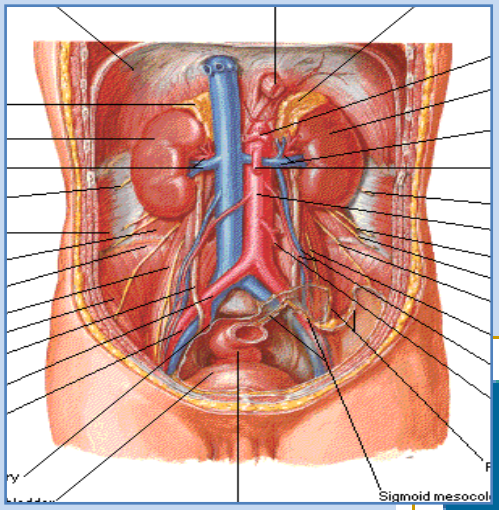
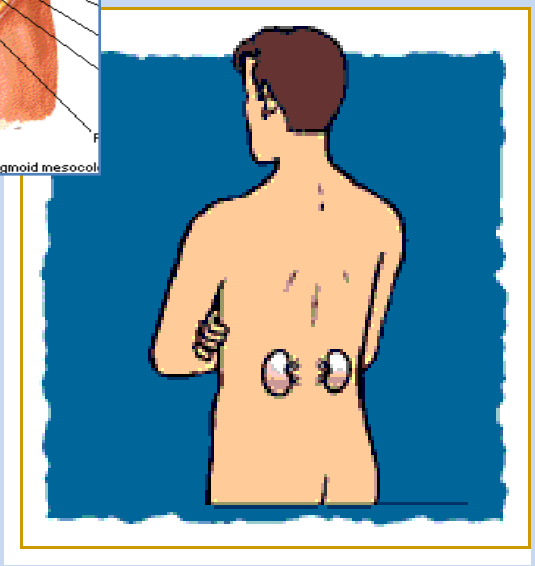
Renal Disease: Pathology, trajectory, numbers and treatment options

RENAL PALLIATIVE CARE SYMPOSIUM 2010





George Mangos
Nephrologist
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Kogarah
UNSW

The Patient

The Patient

- 73 yo female
- Resistant HT
- T2 Diabetes, proteinuria
- Cr 230 micromol/l
- eGFR 18 ml/min

SEVERE CHRONIC KIDNEY DISEASE

Questions

- But I feel fine !
- Will I lose my kidneys?
- Am I going to need dialysis?
- Can I have a transplant?
- Are there side-effects to dialysis?

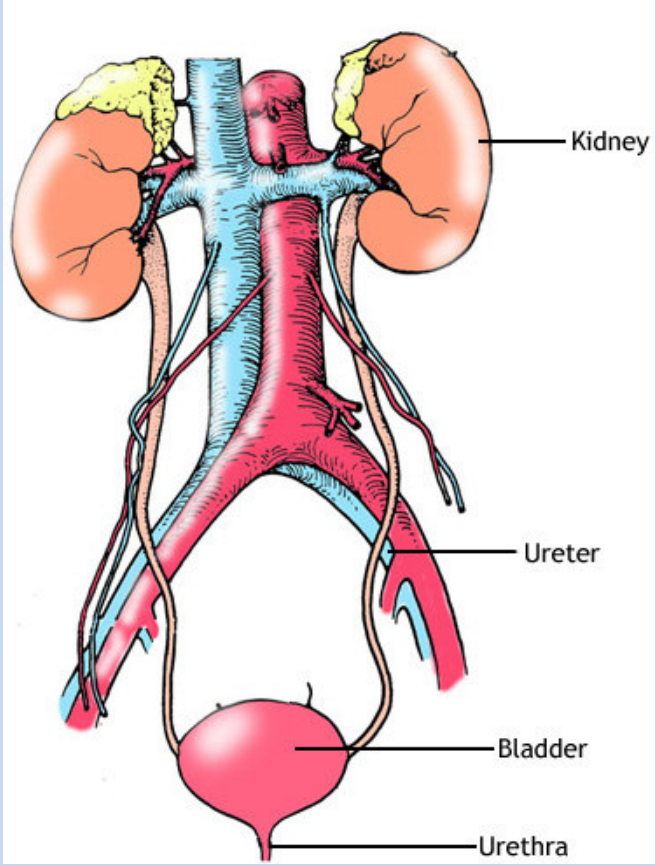
** Fear **

RENAL PALLIATIVE CARE SYMPOSIUM

- Kidneys and Chronic Kidney Disease
- Age and GFR
- Burden and pathology of disease in A&NZ
- Symptoms of CKD
- Pathways and planning treatment
- Renal Replacement Therapy

The Kidneys & Glomerular Filtration

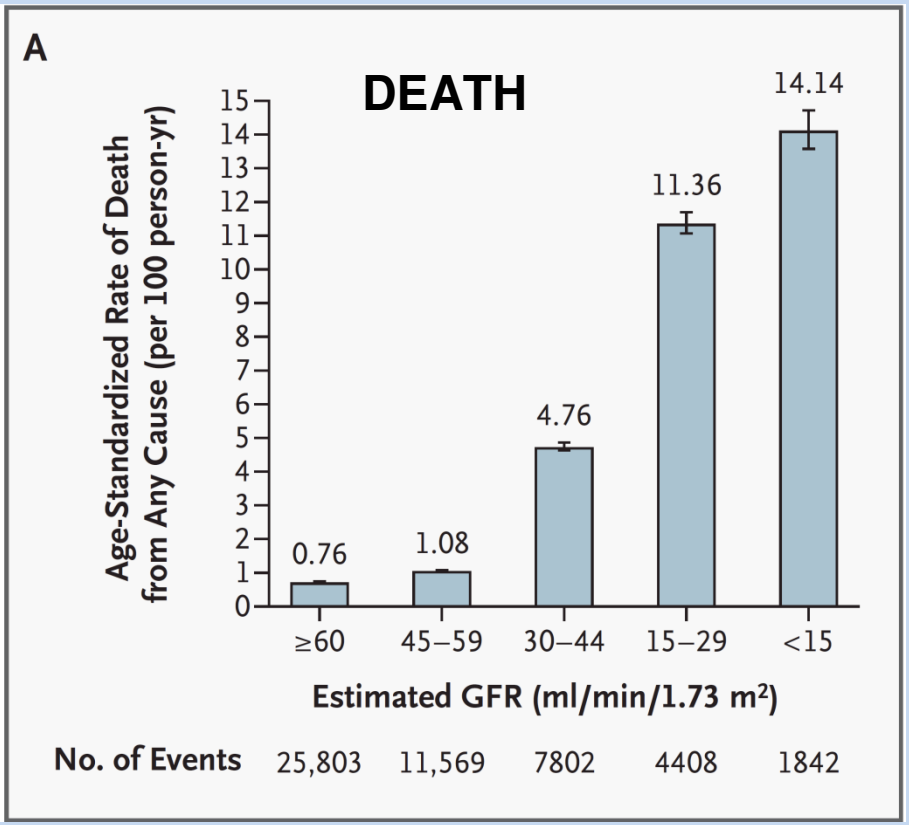
- Upper abdomen
- 0.3-1 million filters each side
- 2600 L blood/day
- 180 L filtered fluid (glomerular filtrate)
- 2 L urine per day

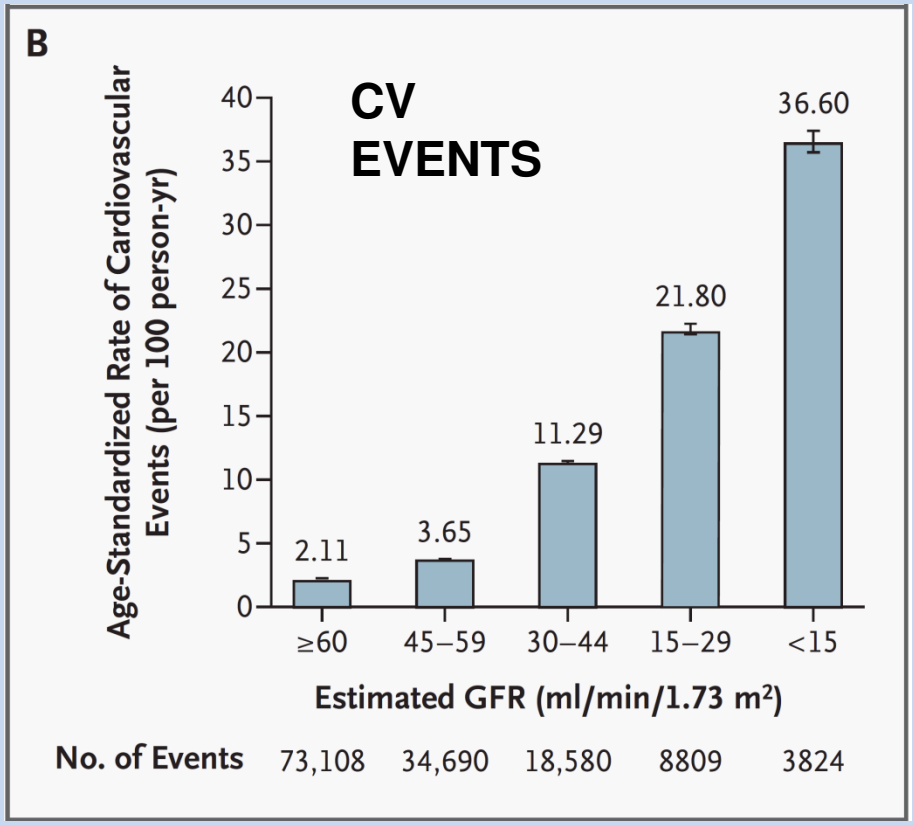


Jonah Lomu

CKD Mortality and Cardiovascular Events

Age-Standardized Rates of Death from Any Cause (Panel A) and Cardiovascular Events (Panel B), According to the Estimated GFR among 1,120,295 Ambulatory Adults





Go et al. NEJM 2004 351: 1296

CKD and Mortality in large studies: Meta-Analysis

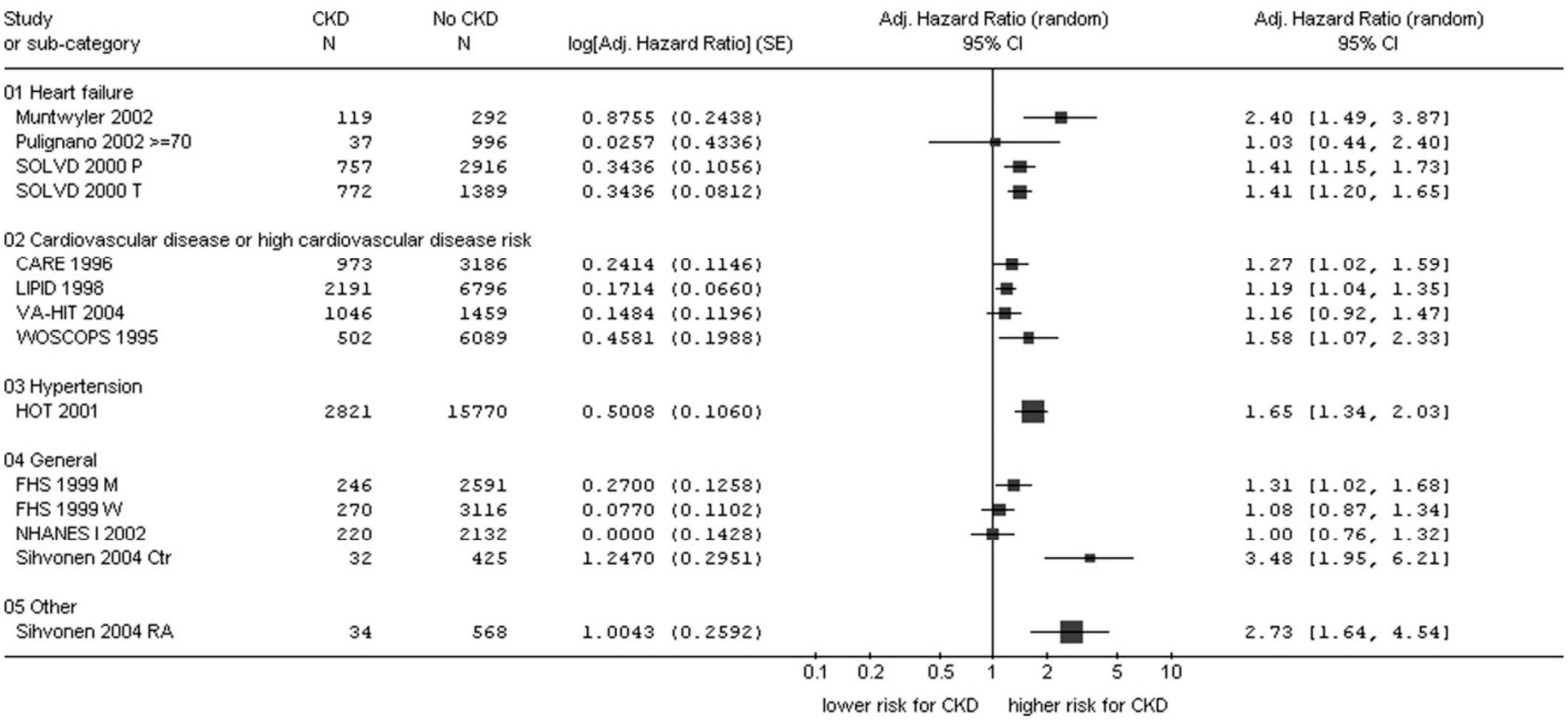


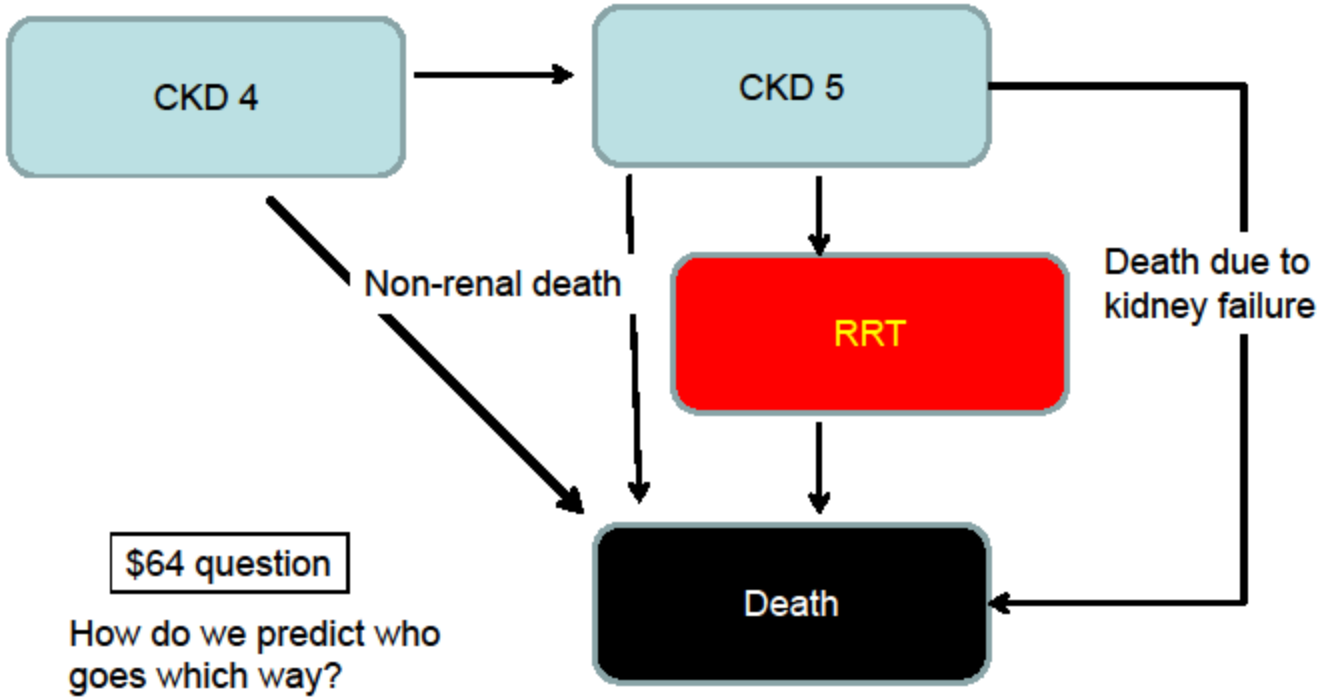
Figure 4. All-cause mortality in CKD using adjusted hazard ratios.

What happens to CKD 4?

- 2 key outcomes
  - Death
    - From non-renal causes
    - From end-stage kidney disease
  - Renal replacement therapy

Slide adapted from A/P Stephen McDonald, ANZDATA

Possible transitions

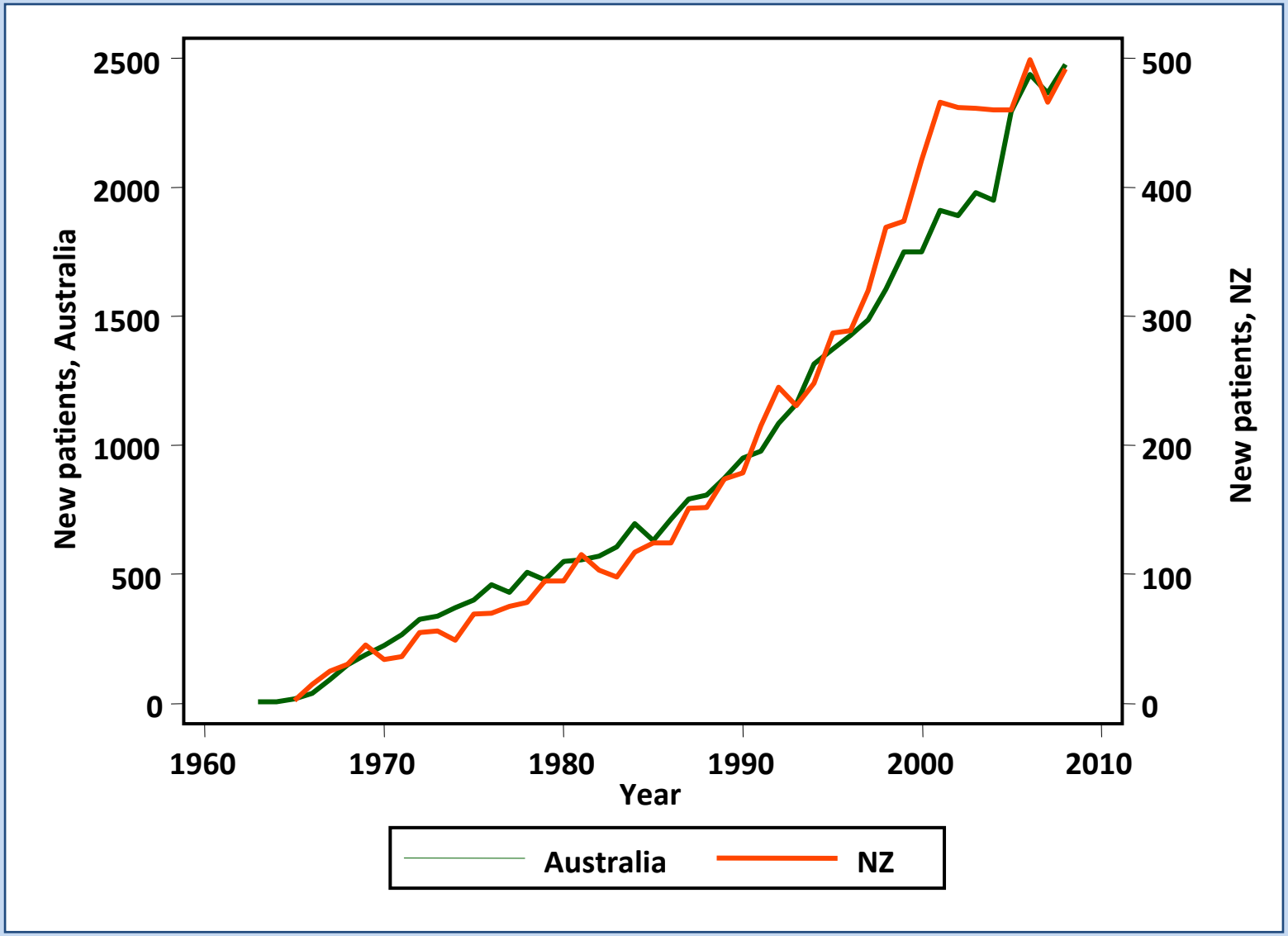


Slide adapted from A/P Stephen McDonald, ANZDATA

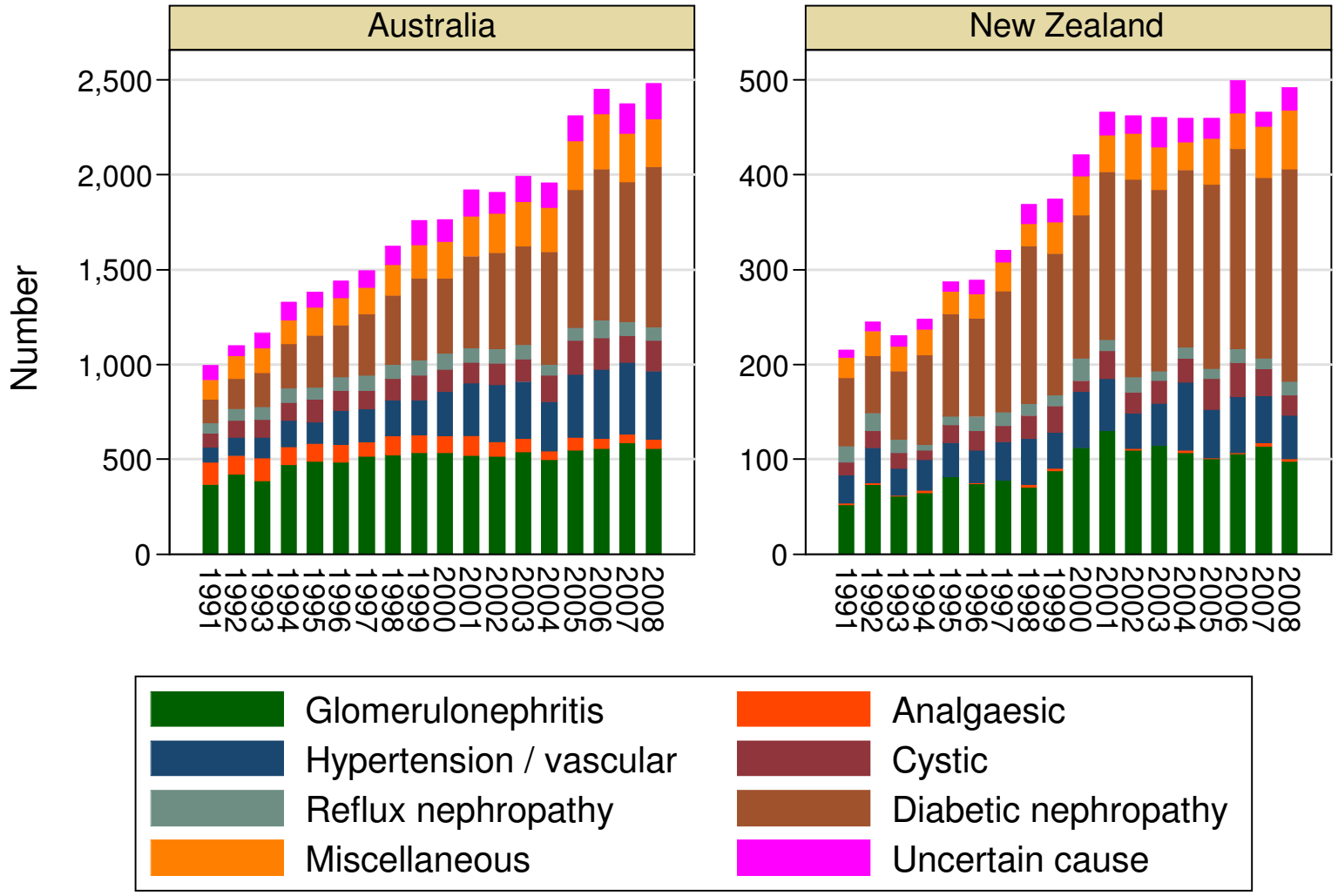
Burden of Disease – 2009 report

- Australia (2008 data)
- RRT = 17,578
- Transplant = 7,516
- Dialysis = 10,062
- *Numbers St 4 & St 5 without RRT unknown*

Number Starting Renal Replacement Therapy
Dialysis or Transplantation
Australia and New Zealand

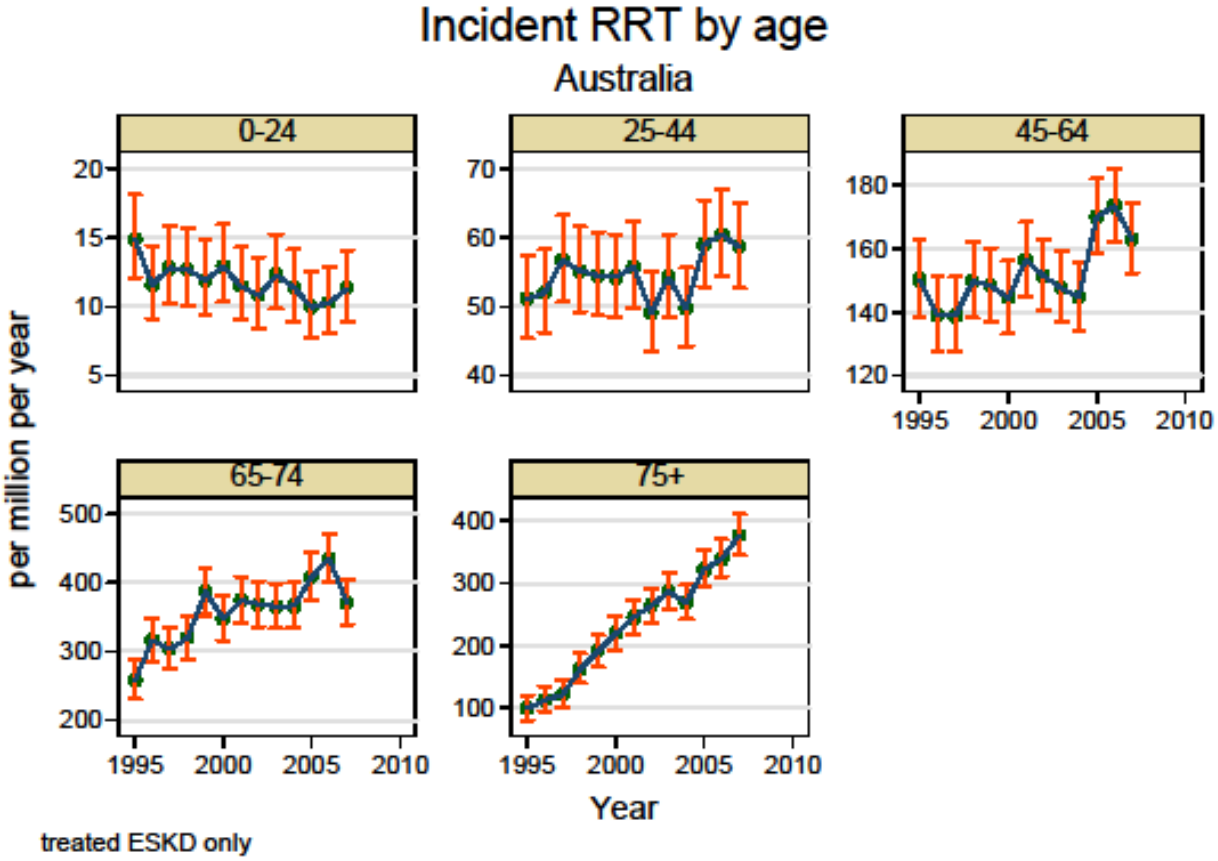


Primary Renal Disease Among People Starting Renal Replacement Therapy

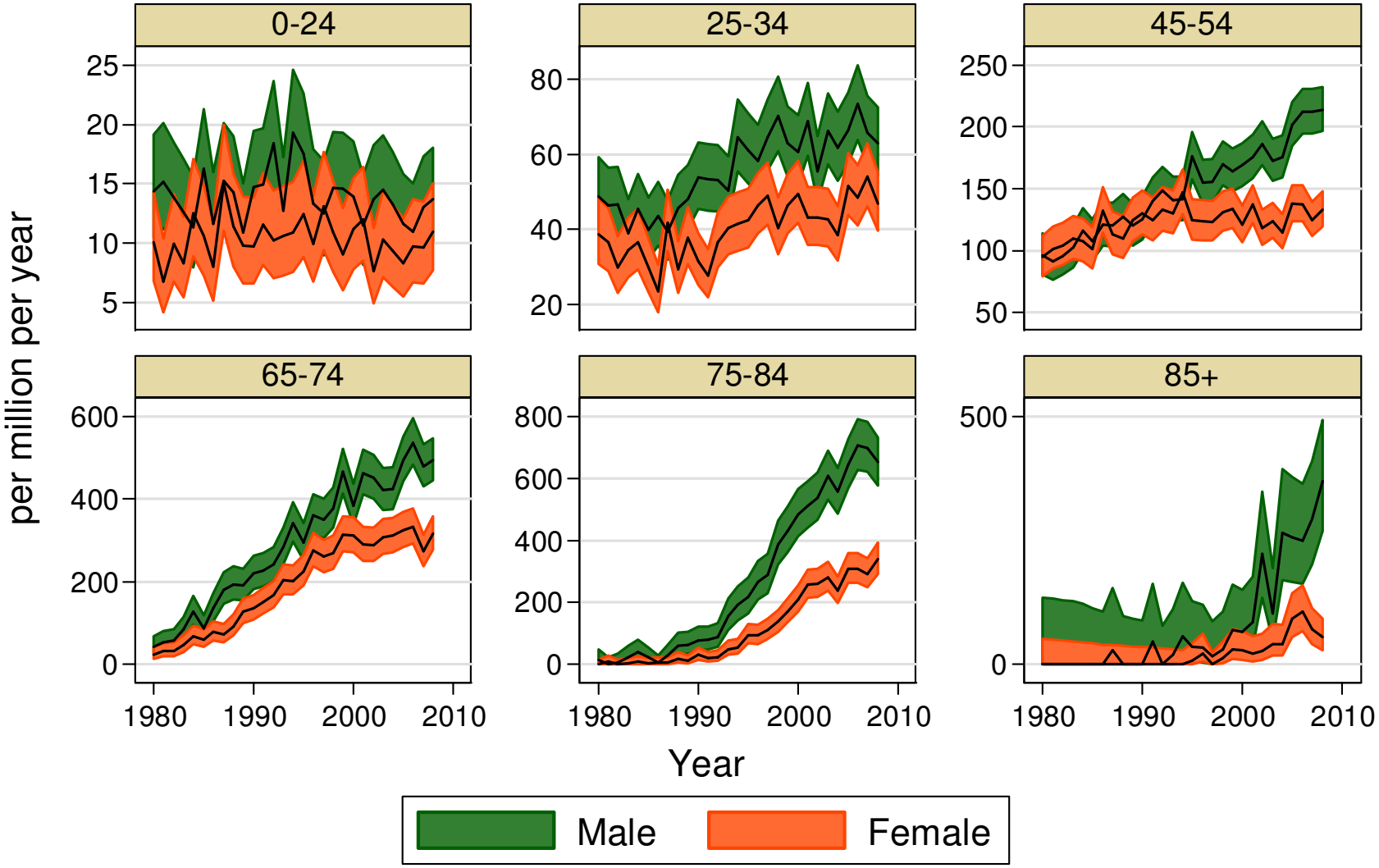


Note different y axis scales

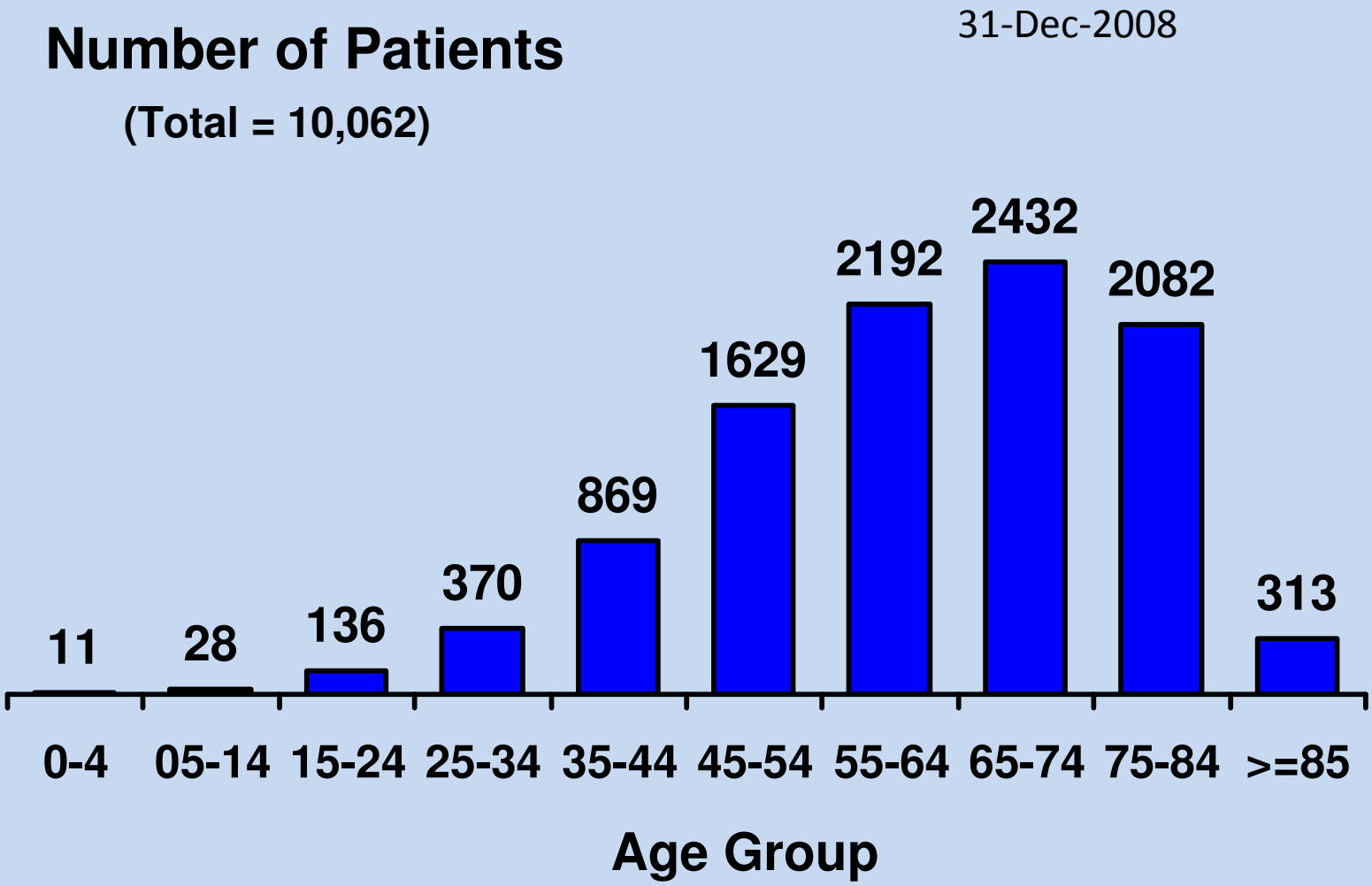
Incidence of RRT in Australia



Incident RRT Rates – Australia
By Gender and Age Group



Prevalent Dialysis Patients (Australia)



Outcomes in CKD4/5

- Australian data from AusDiab
  - Some selection bias
  - Only current national population-based data
  - Prevalence of CKD
    - For 65-74 y.o., 24% stage3, 0.8% CKD 4/5
    - For 75+ y.o. 38% CKD3, 2.5% CKD4/5

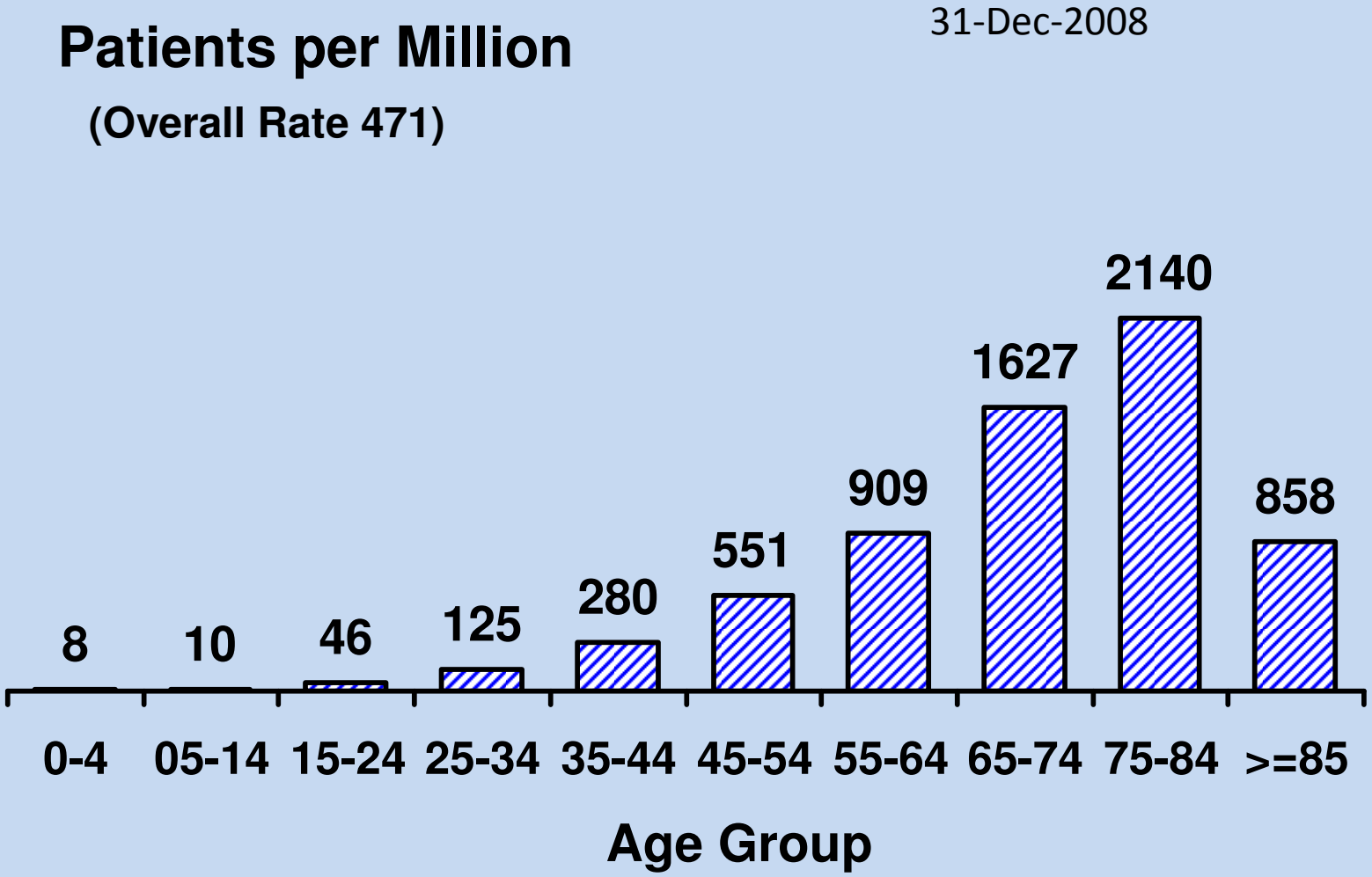
65-74 = 8 000 / 1 000 000 CKD 4/5
75 + = 25 000 / 1 000 000 CKD 4/5

Slide adapted from A/P Stephen McDonald, ANZDATA

www.anzdata.org.au

Chadban S et al JASN 2003

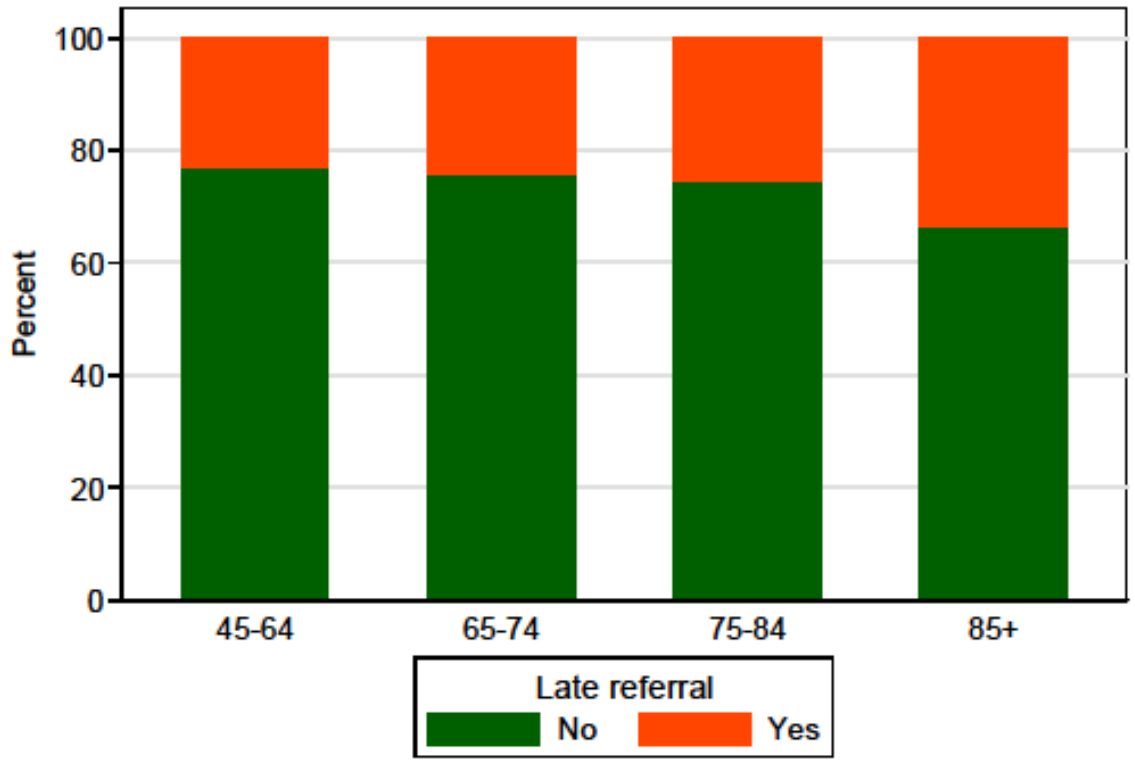
Prevalent Dialysis Patients (Australia)



- Only a small proportion of elderly people with Stage 4/5 will be dialysed.

- This is elderly group will (dialysed or not) require expertise we are discussing today

Late referral



RRT starts, Australia, 2003-7

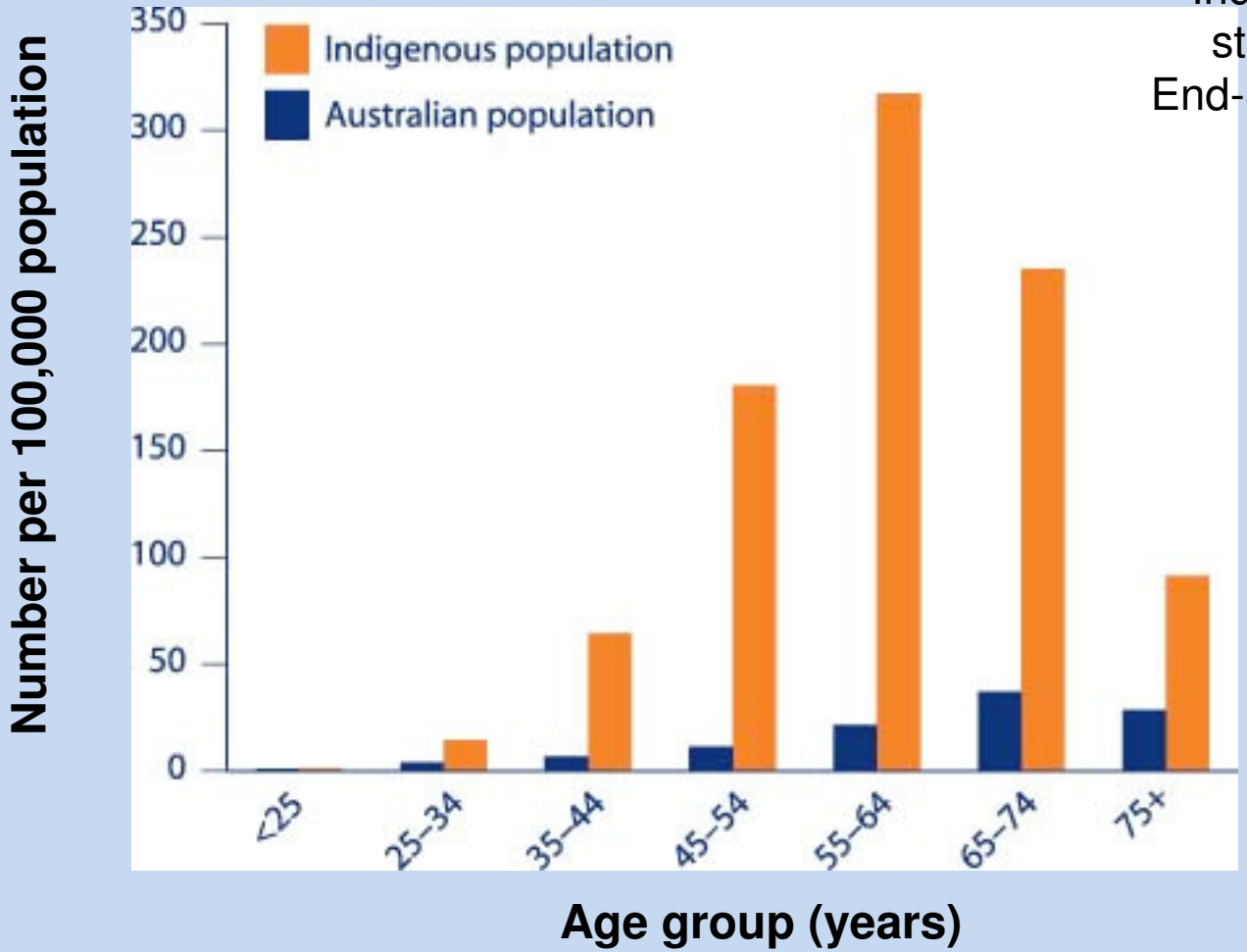
www.anzdata.org.au

Slide adapted from A/P Stephen McDonald, ANZDATA

Non-modifiable risk factor:

Aboriginal or Torres Strait Islander heritage

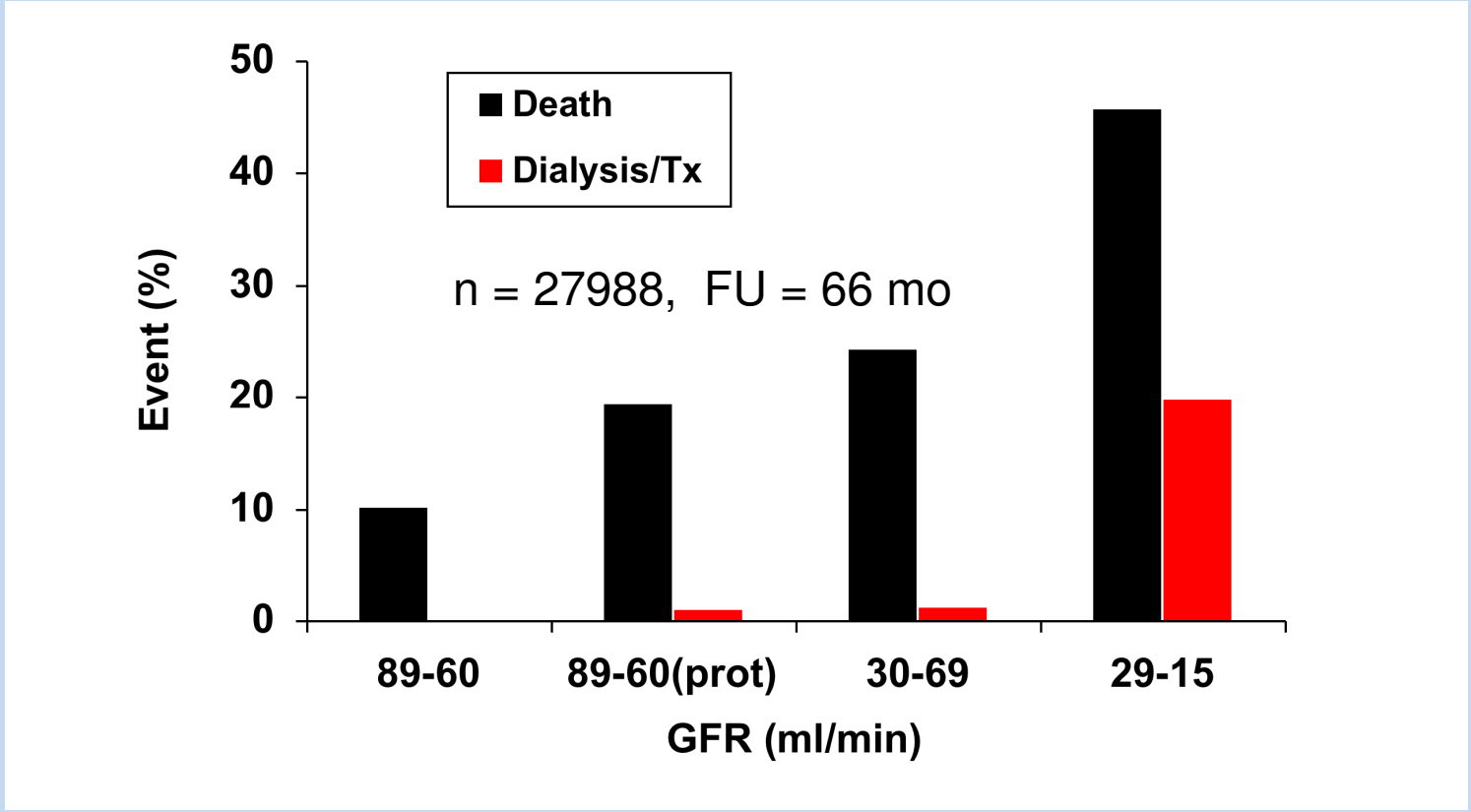
Indigenous Australians starting treatment for End-Stage Kidney Disease



Source: Australian Institute of Health and Welfare, "Heart, stroke and vascular diseases, Australian facts 2004".

Outcomes in patients with CKD

Kaiser Permanente Longitudinal Study



Patients with CKD are 20 times more likely to die from cardiovascular events than survive to reach dialysis

Keith et al Arch Int Med 2004

Symptoms of Kidney failure

- Fatigue
- Nausea
- Itch

- Insomnia
- Dyspneoa
- Depression

- Anaemia
- ?
- Multiple

- Iron and EPO
- ?
- Antihistamines + creams

Presentation of CKD

Clinical Presentation of CKD

CKD is generally asymptomatic.

- Patients do not normally present with symptoms of CKD, so annual checking of those at risk is essential
- People with CKD may not notice any symptoms until they reach end stage kidney disease requiring dialysis or transplant (eGFR <15 mL/min/1.73^2)

Symptoms of end stage kidney disease include:

- Nocturia
- Malaise
- Anorexia/nausea/vomiting
- Pruritus
- Restless legs
- dyspnoea

eGFR clinical action plan

eGFR mL/min/1.73m²	Description	Clinical Action Plan
≥ 90	Stage 1 CKD – kidney damage* with normal kidney function OR	Further investigation for CKD may be indicated in those at increased risk**: • blood pressure • assessment of proteinuria • urinalysis
60 – 89	Stage 2 CKD – kidney damage* with mild ↓ kidney function	Cardiovascular risk reduction: • blood pressure • lipids • blood glucose • lifestyle modification (smoking, weight, physical activity, nutrition, alcohol)

* imaging or biopsy abnormalities, or proteinuria/haematuria

** hypertension, diabetes, smoker, age > 50 yrs, obesity, family history of kidney disease, Aboriginal and Torres Strait Islander people

eGFR clinical action plan…continued

eGFR mL/min/1.73m^2	Description	Clinical Action Plan
30 - 59	Stage 3 CKD – moderate ↓ kidney function	Stage 3 CKD - moderate ↓ kidney function As above, plus: • monitor eGFR 3 monthly • avoid nephrotoxic drugs • Prescribe antiproteinuric drugs (ACE inhibitors and/or ARB) if appropriate • Address common complications • Ensure drug dosages appropriate for level of kidney function Consider referral to nephrologist
15-29	Stage 4 CKD – severe ↓ kidney function	As above + referral to nephrologist is usually indicated for physical and psychosocial preparation for renal replacement therapy (dialysis, pre-emptive transplantation, transplantation) or conservative medical management
<15	Stage 5 CKD – end-stage kidney disease	As above + referral to nephrologist

eGFR clinical action plan…continued

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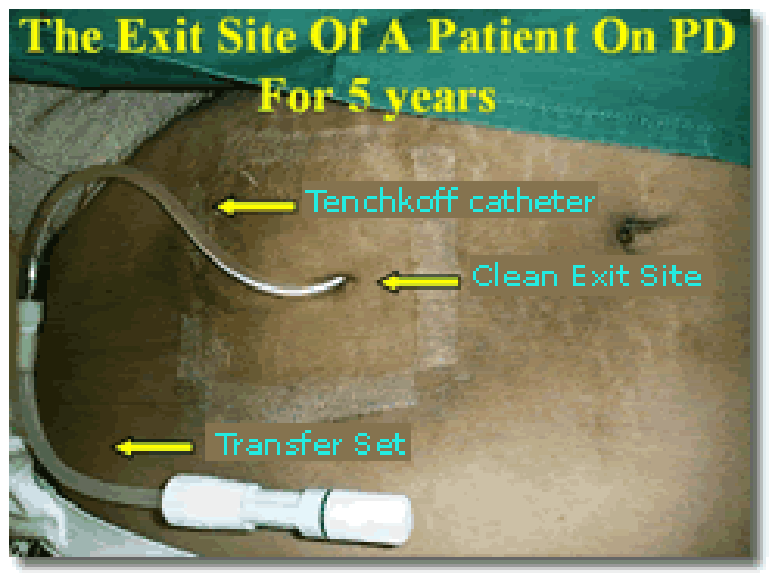
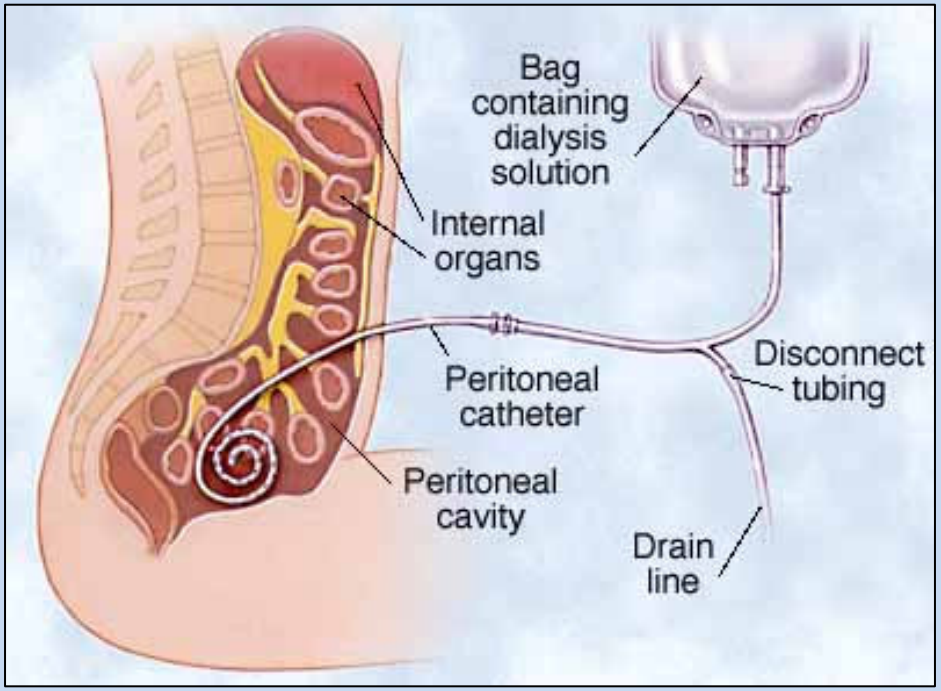
Peritoneal Dialysis

Peritoneal Dialysis

- Tube placed in patient's abdomen
- Fluid exchanged 4 times/day or overnight to clean blood
- Waste removed through thin layer of tissue lining the abdomen



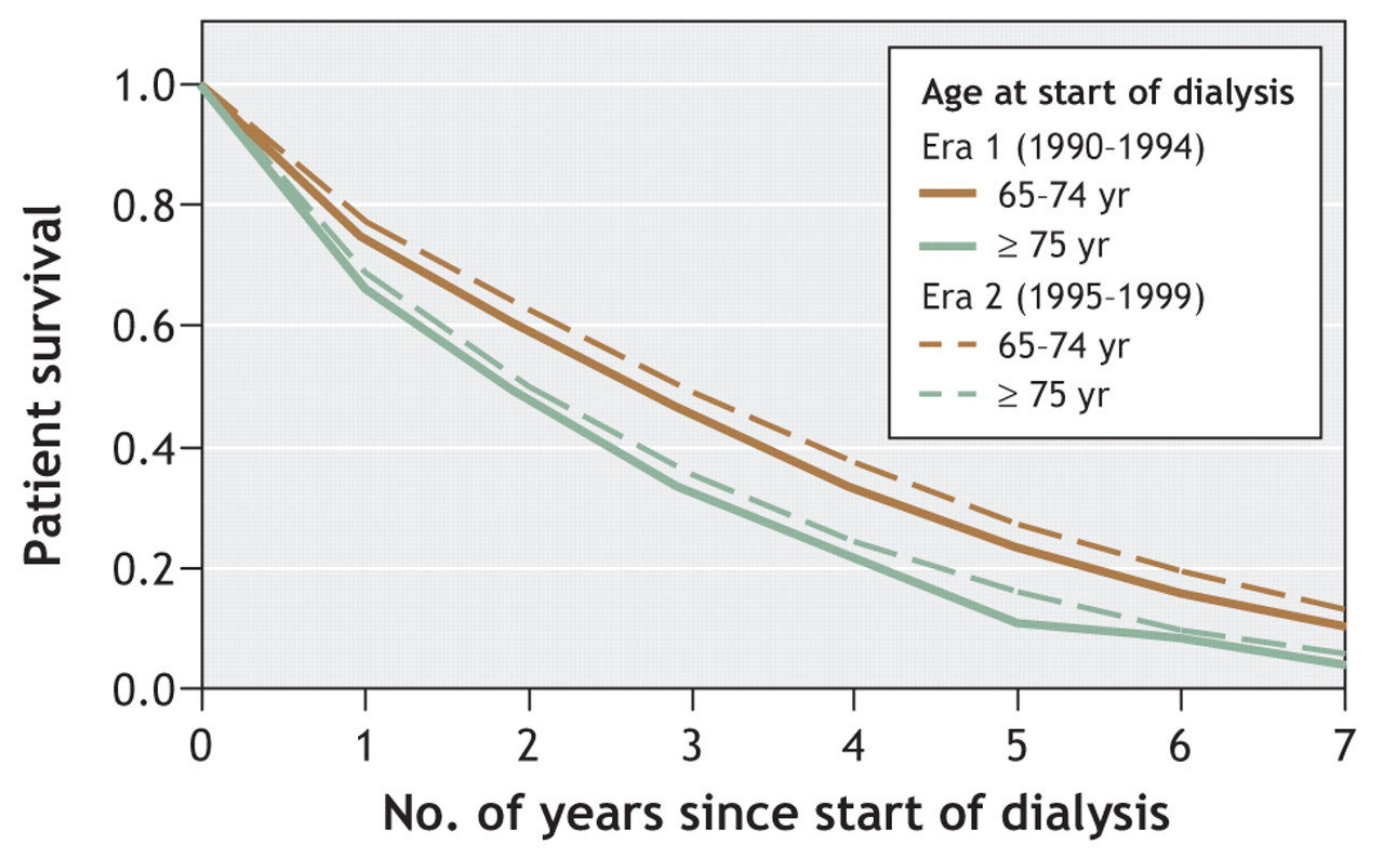


Haemodialysis

- Blood cleaned 3 times per week
- 5 hours/session
- Home or hospital
- Lifelong or until transplantation
- Requires a ‘fistula’ in the arm

Outcomes of the Elderly on Dialysis therapy

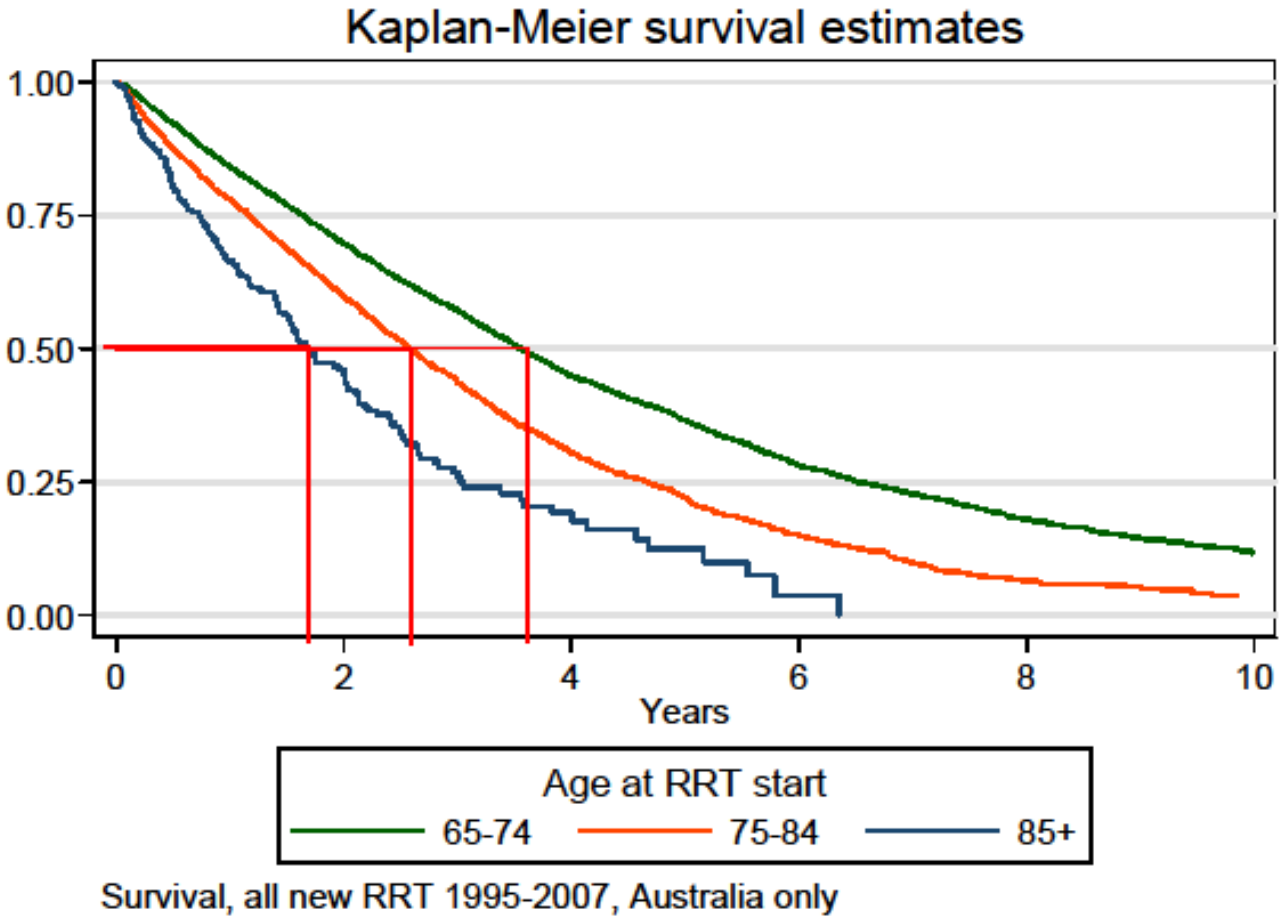
Figure 1: Survival curves for patients aged 65-74 years and those aged 75 or more who began dialysis during 1990-1994 (era 1, solid lines) and 1995-1999 (era 2, dotted lines)



Jassal, S. V. et al. CMAJ 2007;177:1033-1038

CMAJ·JAMC

Survival on dialysis

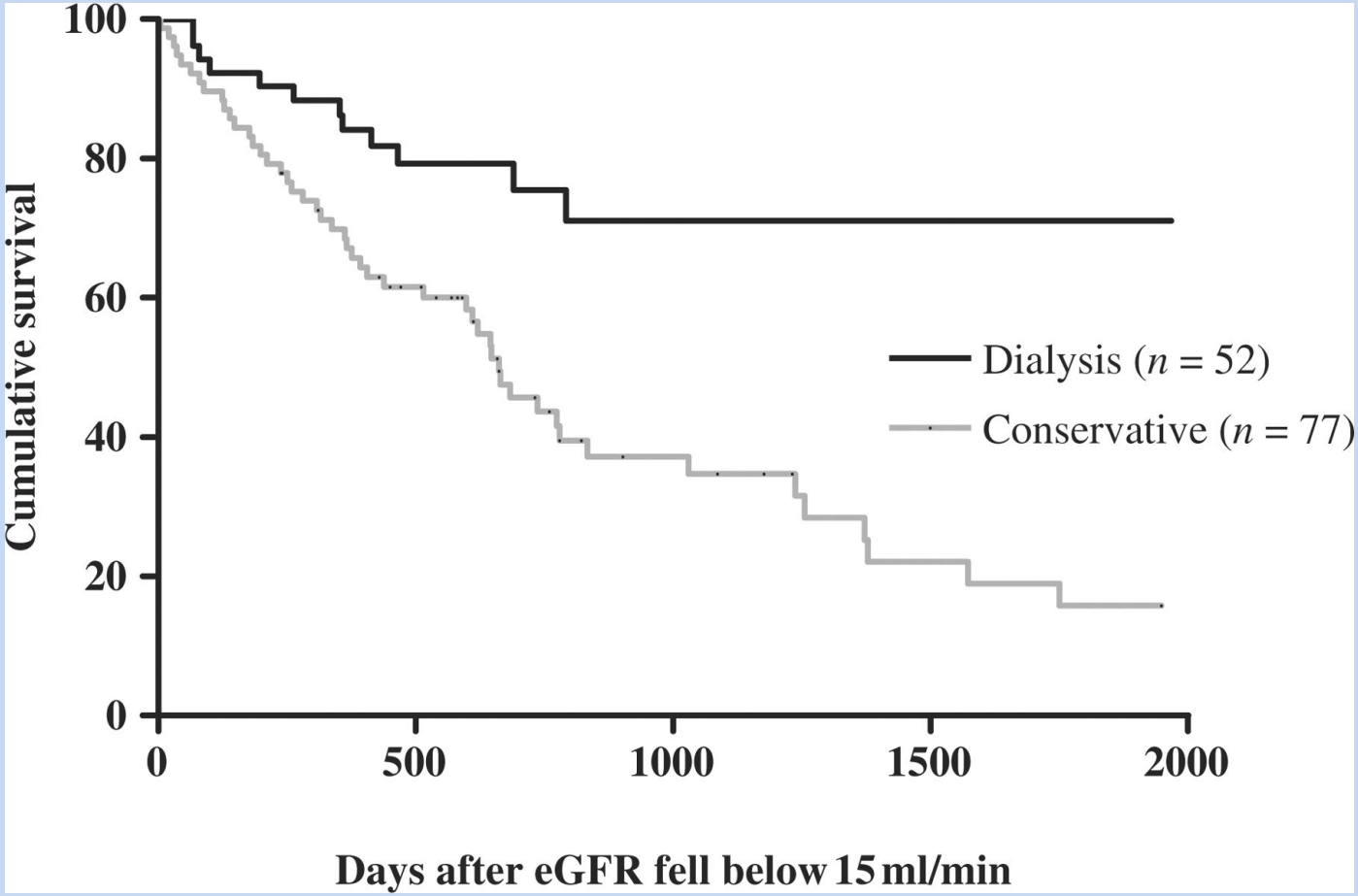


Survival, all new RRT 1995-2007, Australia only

Slide adapted from A/P Stephen McDonald, ANZDATA

Does dialysis treatment prolong survival in the elderly ?

Kaplan-Meier survival curves comparing the dialysis and conservative groups (log rank statistic = 13.63, P < 0.001) - age >75 yrs



Murtagh, F. E. M. et al. Nephrol. Dial. Transplant. 2007 22:1955-1962; doi:10.1093/ndt/gfm153

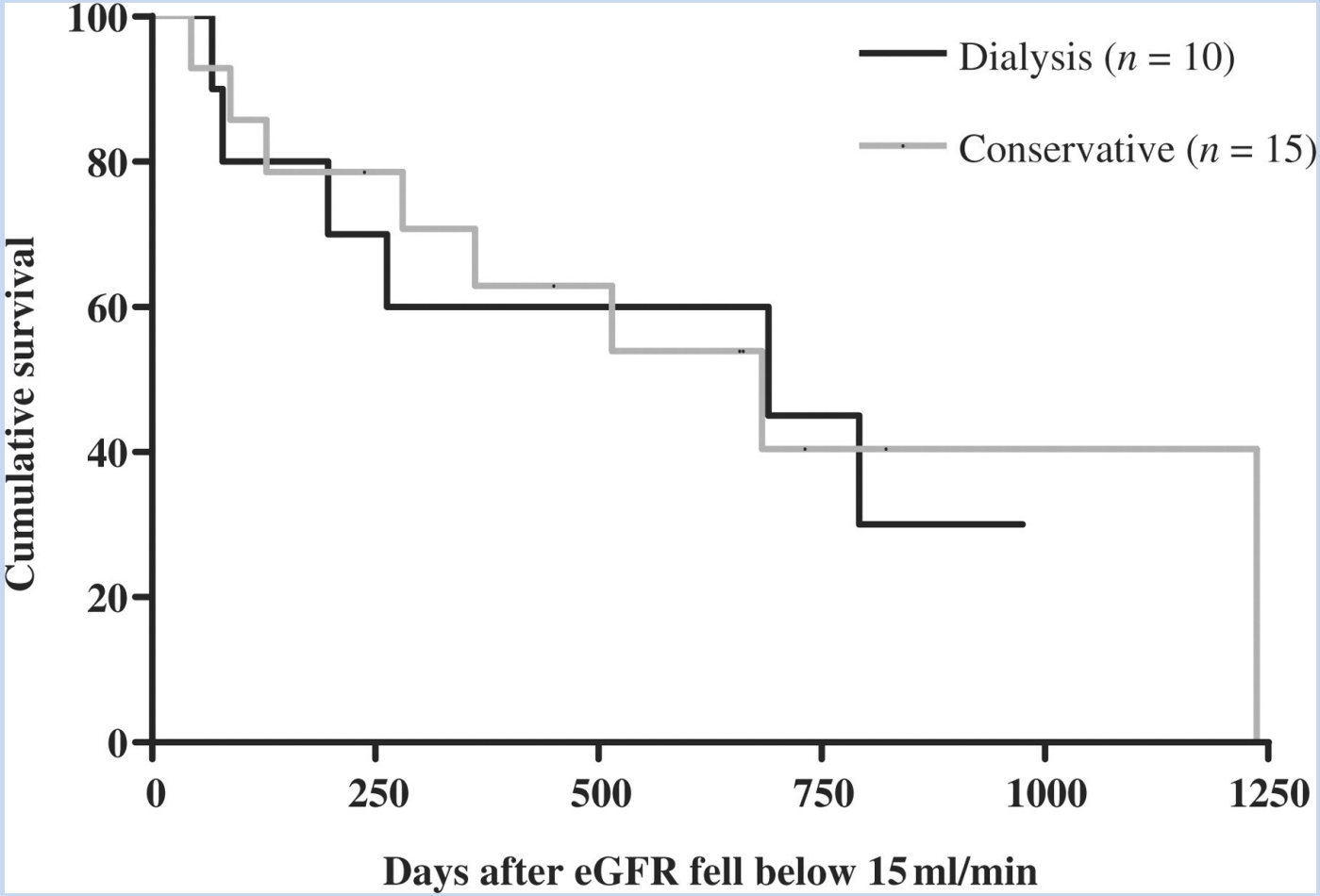
NDT Nephrology Dialysis Transplantation

Effect of comorbidities

Factor	Time ratio	
Diabetes	0.90 [0.85-0.95]	
Coronary artery disease	0.78 [0.74-0.83]	
Cerebrovascular disease	0.83 [0.78 to 0.88]	
Peripheral vasc disease	0.78 [0.73 to 0.82]	
Chronic lung disease	0.79 [0.74 to 0.84]	
Age 75-84	0.69 [0.66 to 0.73]	
Age 85+	0.48 [0.41 to 0.56]	
Male gender	1.15 [1.10 to 1.21]	

Time ratios from multivariate analysis (assuming exponential distribution).
Ratios are MULTIPLICATIVE.

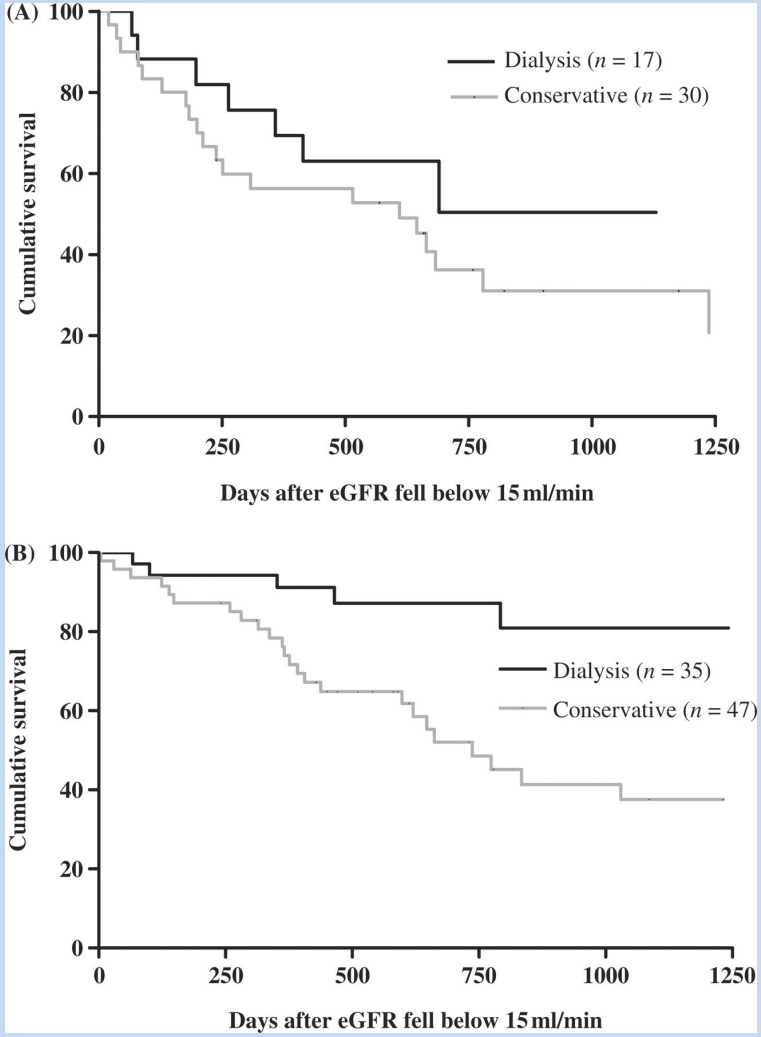
Kaplan-Meier survival curves for those with high comorbidity (score = 2), comparing dialysis and conservative groups (log rank statistic <0.001, df 1, P = 0.98) age > 75 yrs



Murtagh, F. E. M. et al. Nephrol. Dial. Transplant. 2007 22:1955-1962; doi:10.1093/ndt/gfm153

NDT Nephrology Dialysis Transplantation

(A) Kaplan-Meier survival curves for those with ischaemic heart disease, comparing the dialysis and conservative groups (log rank statistic 1.46, df 1, P = 0.27) age > 75 yrs



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NDT Nephrology Dialysis Transplantation

- Good luck and thank you for attending today

Thank you