Management of chronic kidney disease in the elderly

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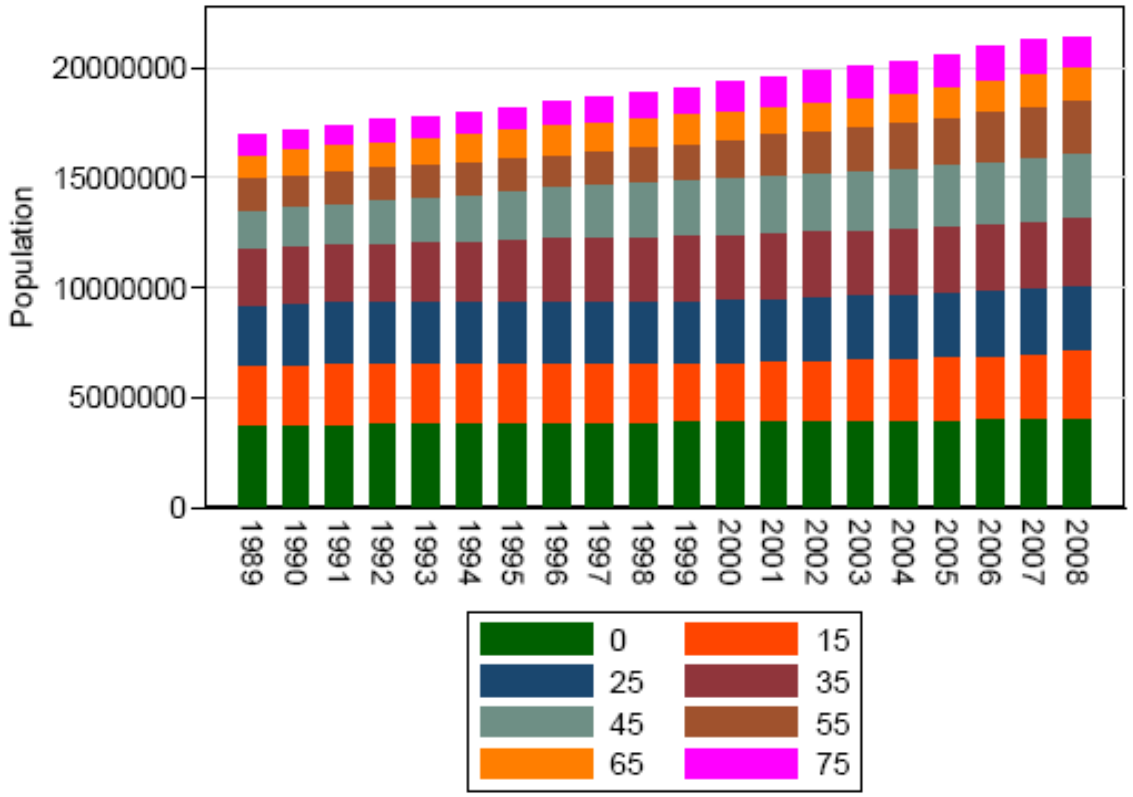
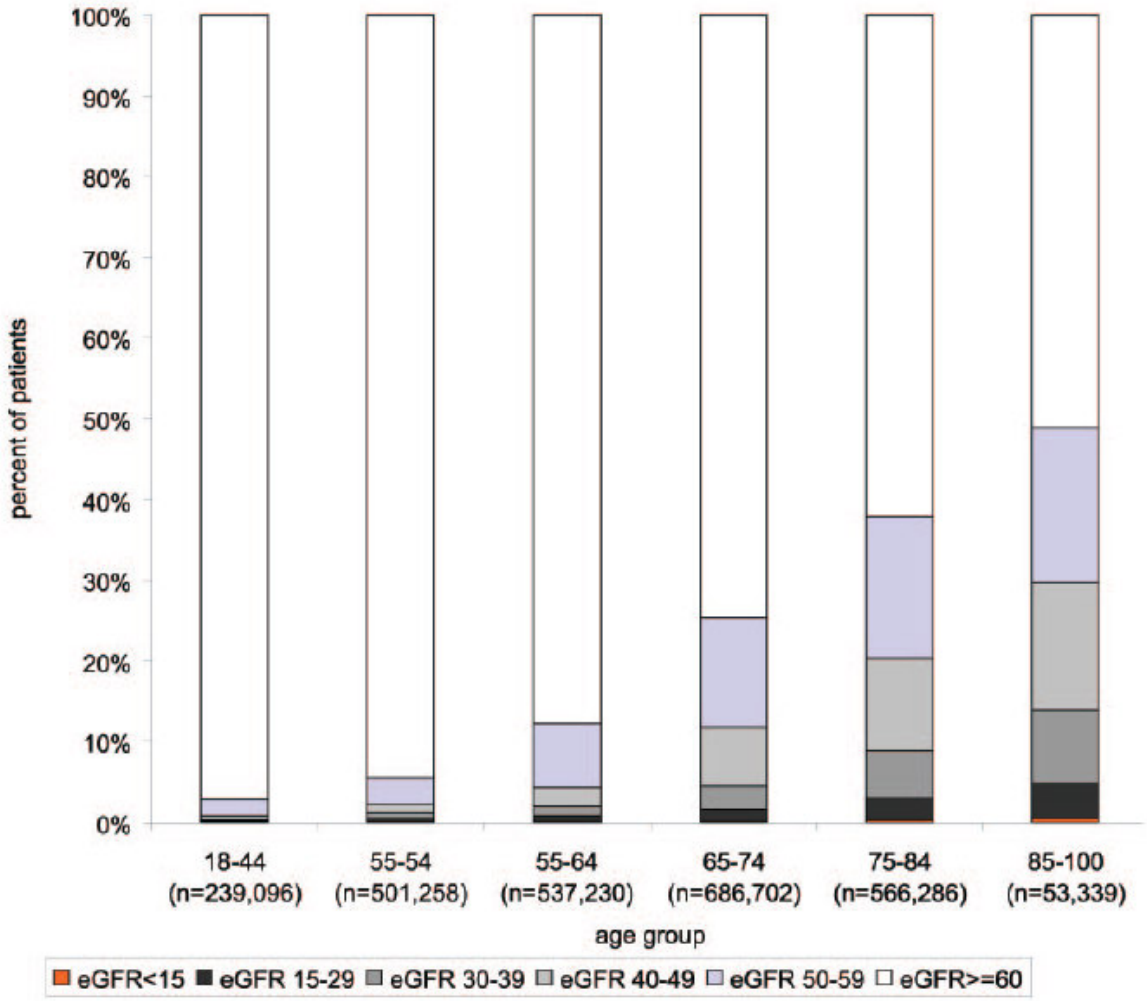
Why is CKD in the elderly important?



Australian population, ABS 32010.9 2008

Why is CKD in the elderly important



O'Hare et al JASN 17; 846-853, 2006

Why is CKD in the elderly important?

ANZDATA 2009

What is chronic kidney disease (CKD)?

- GFR < 60 mL/min/1.73m^2 for >3 months with or without evidence of kidney damage

OR

- Evidence of kidney damage (with or without decreased GFR) for >3 months:
    - microalbuminuria
    - proteinuria
    - glomerular haematuria
    - pathological abnormalities
    - anatomical abnormalities.

How is CKD classified?

Stage	Kidney damage	GFR (mL/min/1.73 m^2)
1	present	>90
2	present	60-89
3	not applicable	30-59
4	not applicable	15-29
5	not applicable	<15 or on dialysis

KDOQI CKD classification system

How is GFR estimated?

Serum creatinine alone is an inaccurate measure of GFR, as it is affected by age, sex, race and muscle mass

Cockgroft Gault, MDRD equation and CKD-EPI factor in creatinine, age and sex (and weight with CG) to estimate GFR

These 3 equations can yield quite disparate estimates of renal function in a given individual

- What happens to kidneys as they age?
- How important is a reduction in GFR in elderly people?
- How to manage CKD in elderly people?
- How to manage ESKD in elderly people?

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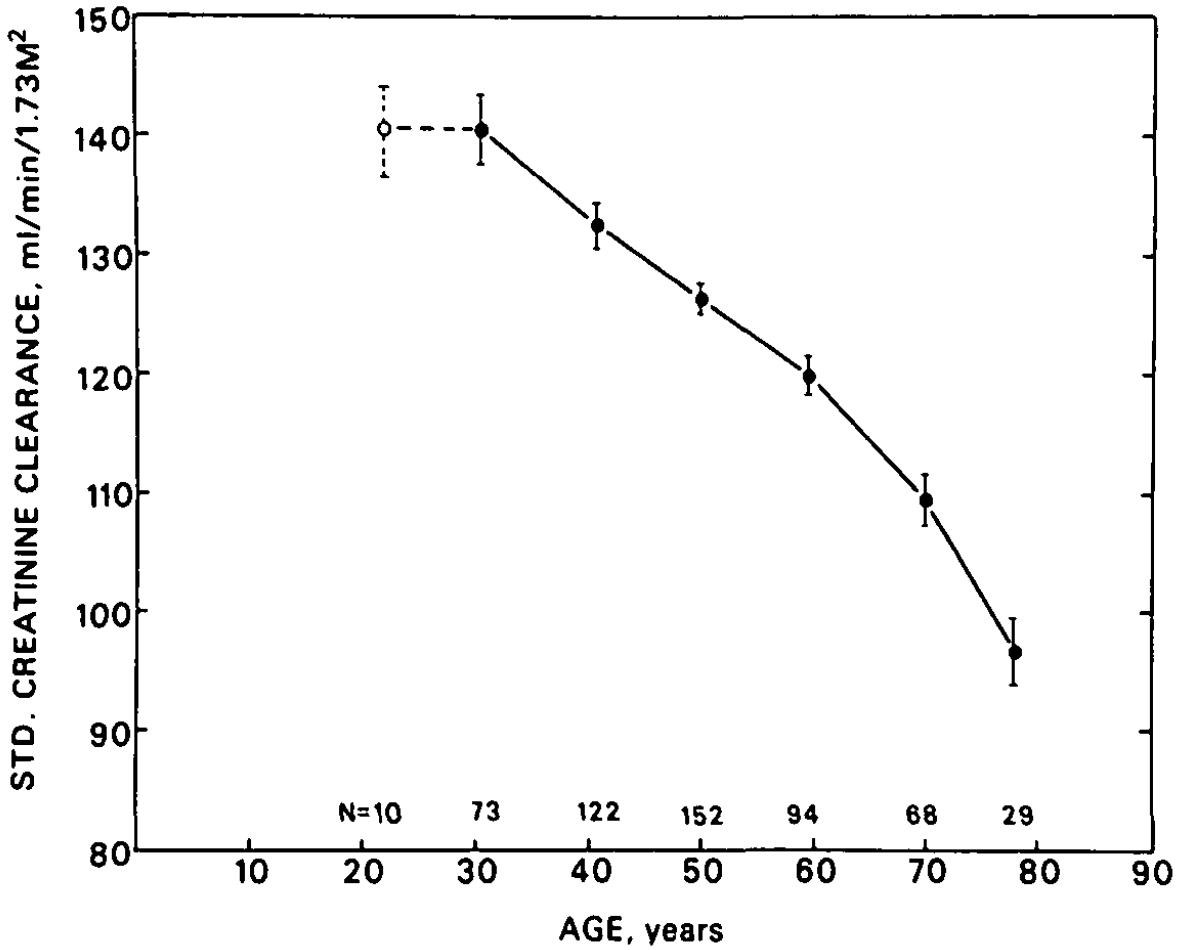
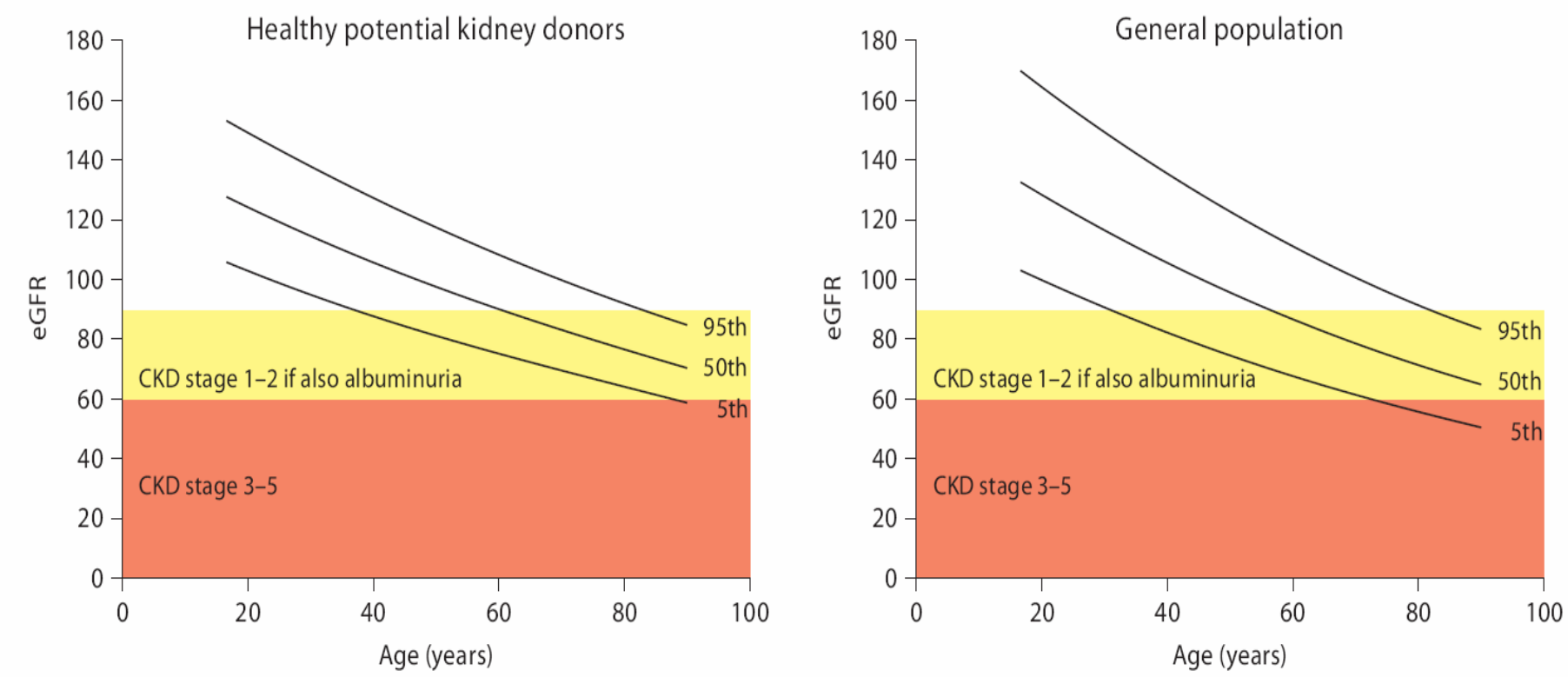
What happens to kidneys as they age?



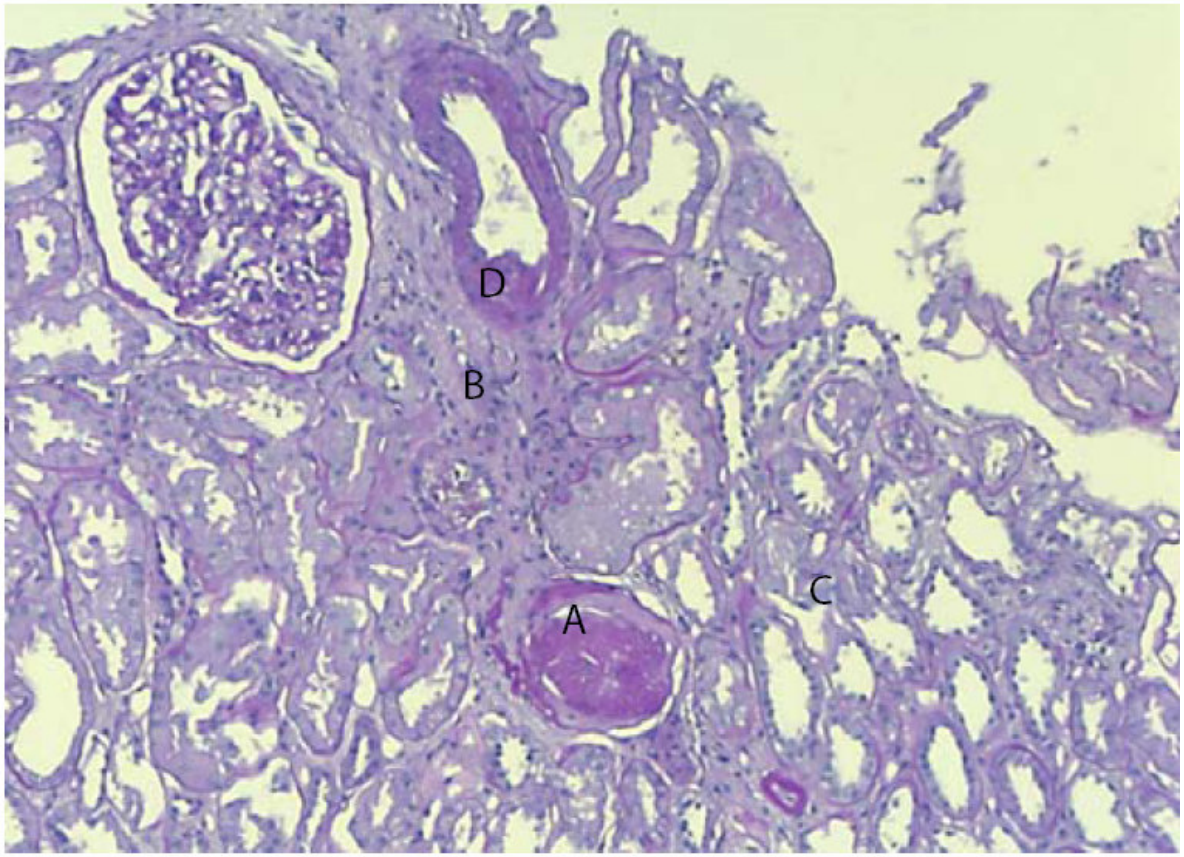
Rowe et al J gerontol 31:155-163, 1976

What happens to kidneys as they age?



Hallan NDT 2006;21:1525-1533

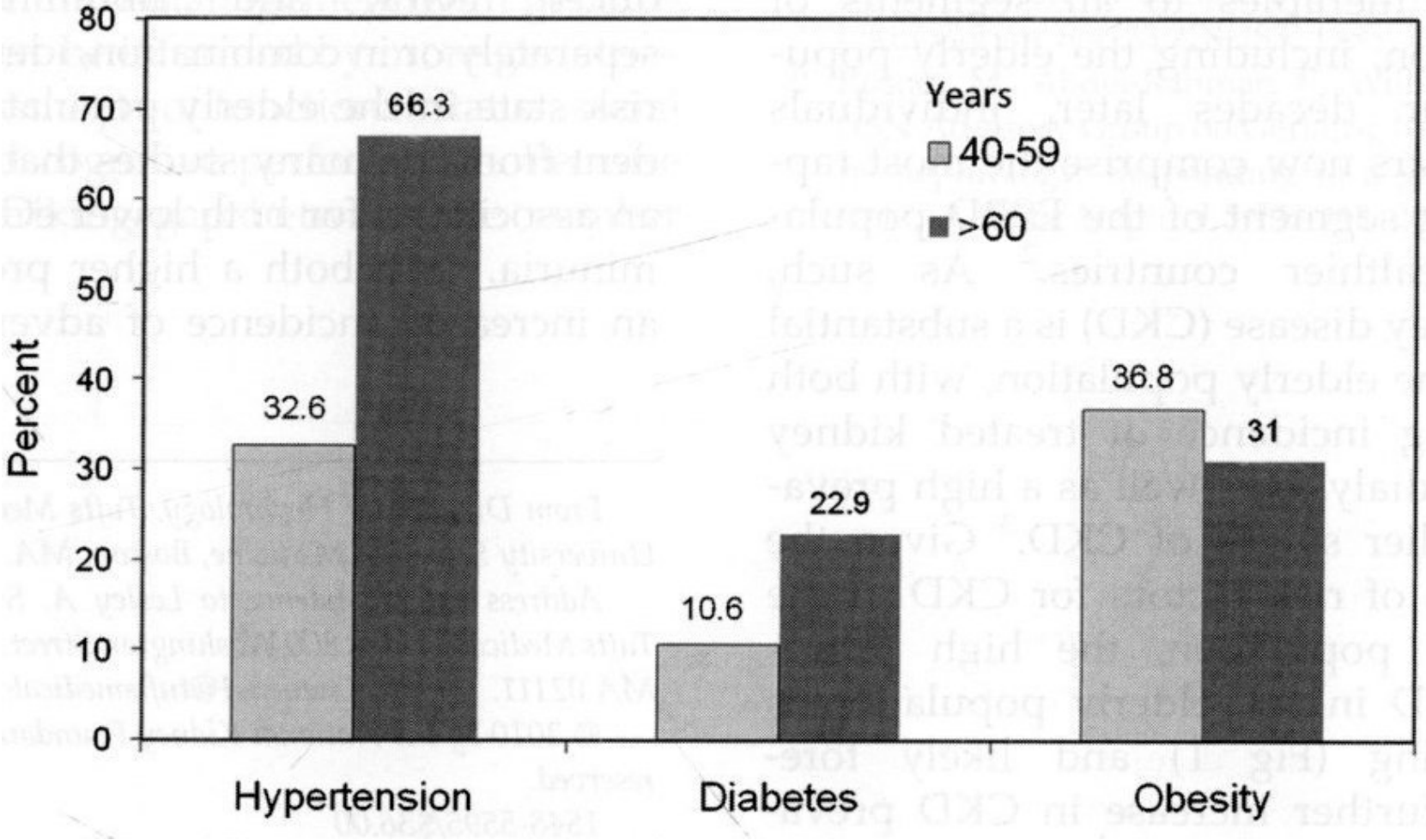
Structural changes



- Glomerular obliteration
- Tubulointerstitial fibrosis
- Tubular atrophy
- Vascular sclerosis
- Loss of renal mass

Nephron Clin Pract 2 c308
010;116:c307–c316

Pathophysiology



Aetiology

- Smoking
- Dyslipidaemia
- Atherosclerotic disease
- Presence of inflammatory markers
- Increased levels of AGE
- Acute kidney injury

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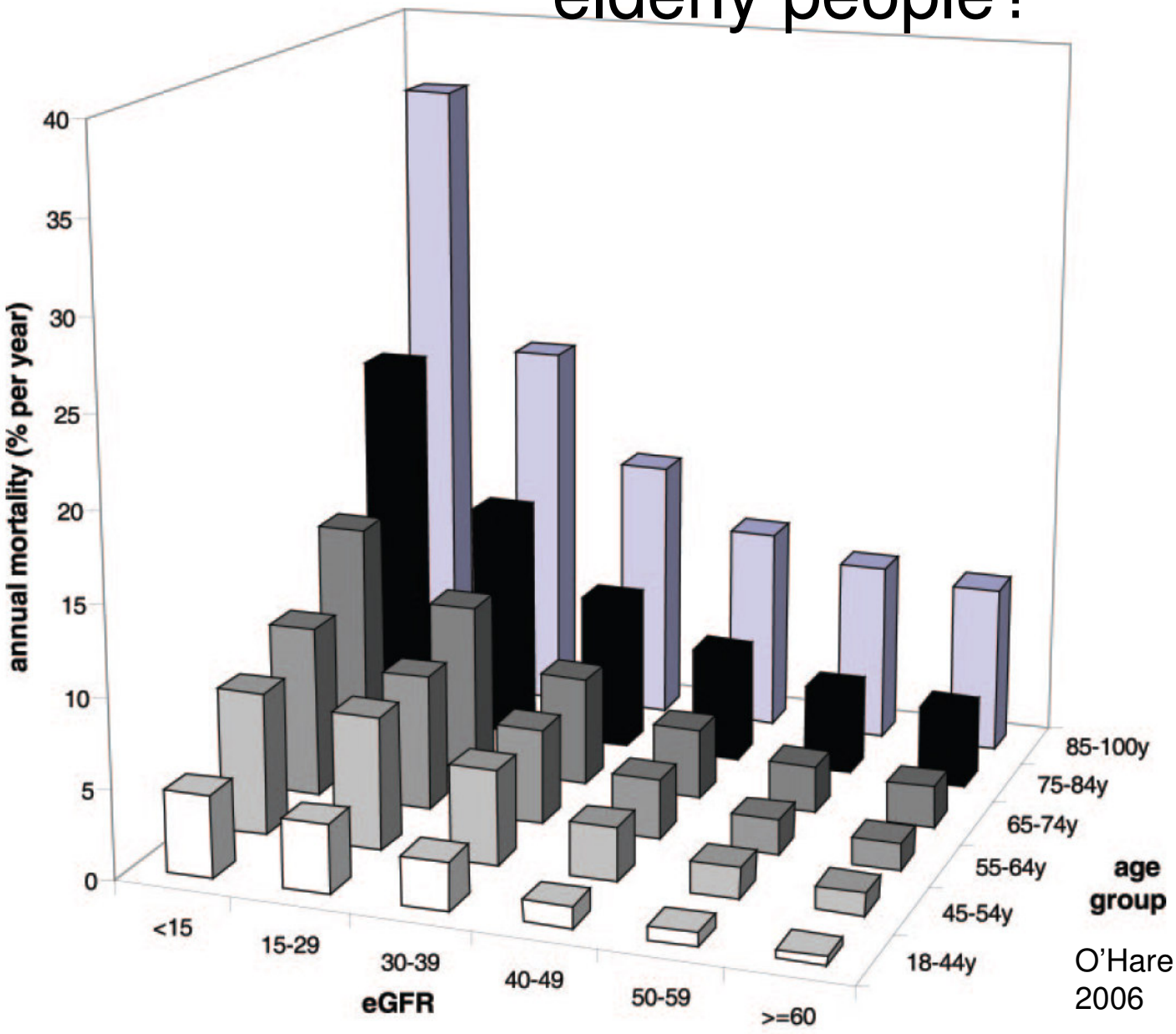
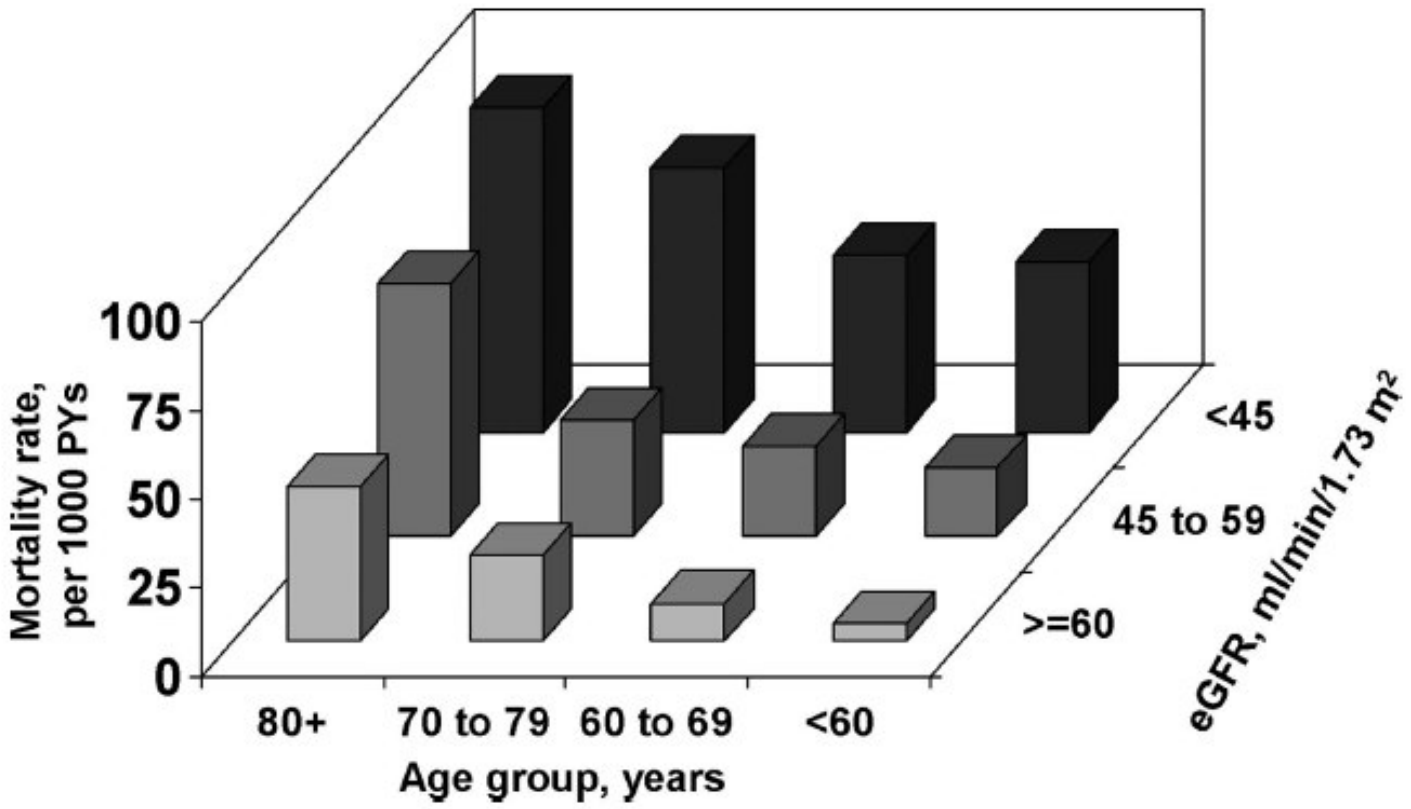
How important is a reduction in eGFR in elderly people?



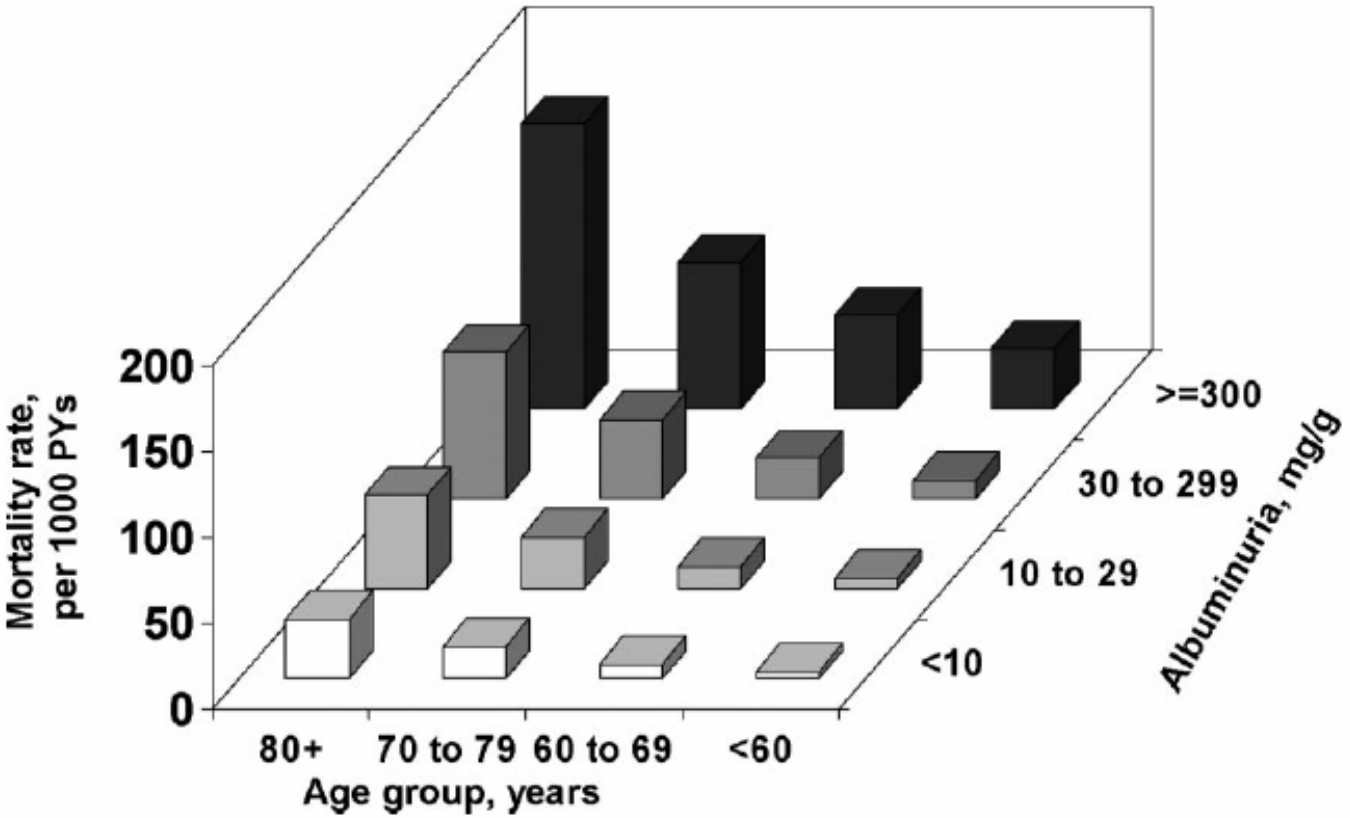
O'Hare et al JASN 17; 846-853, 2006

Mortality



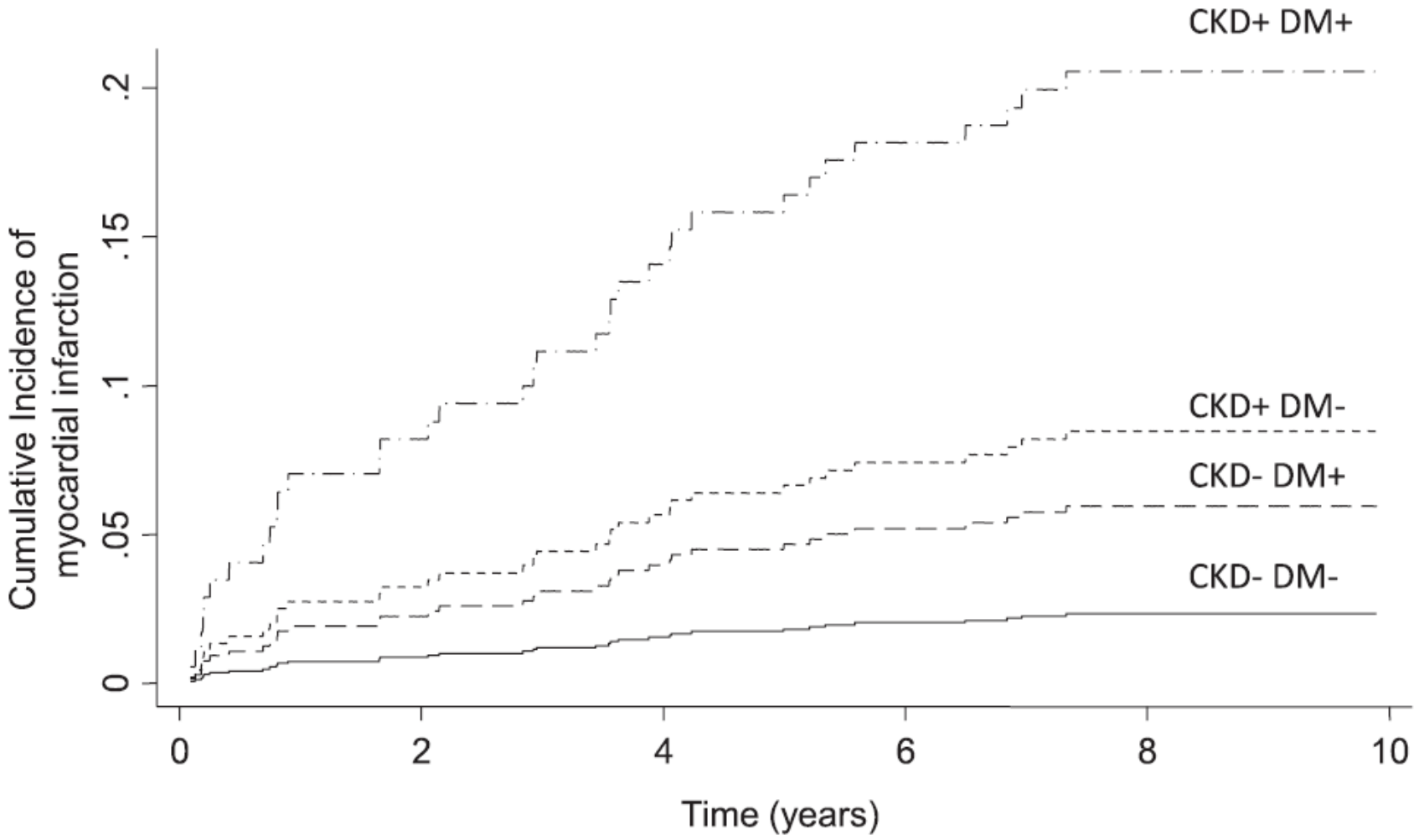
Muntner et al CJASN Vol 6 2011

Mortality



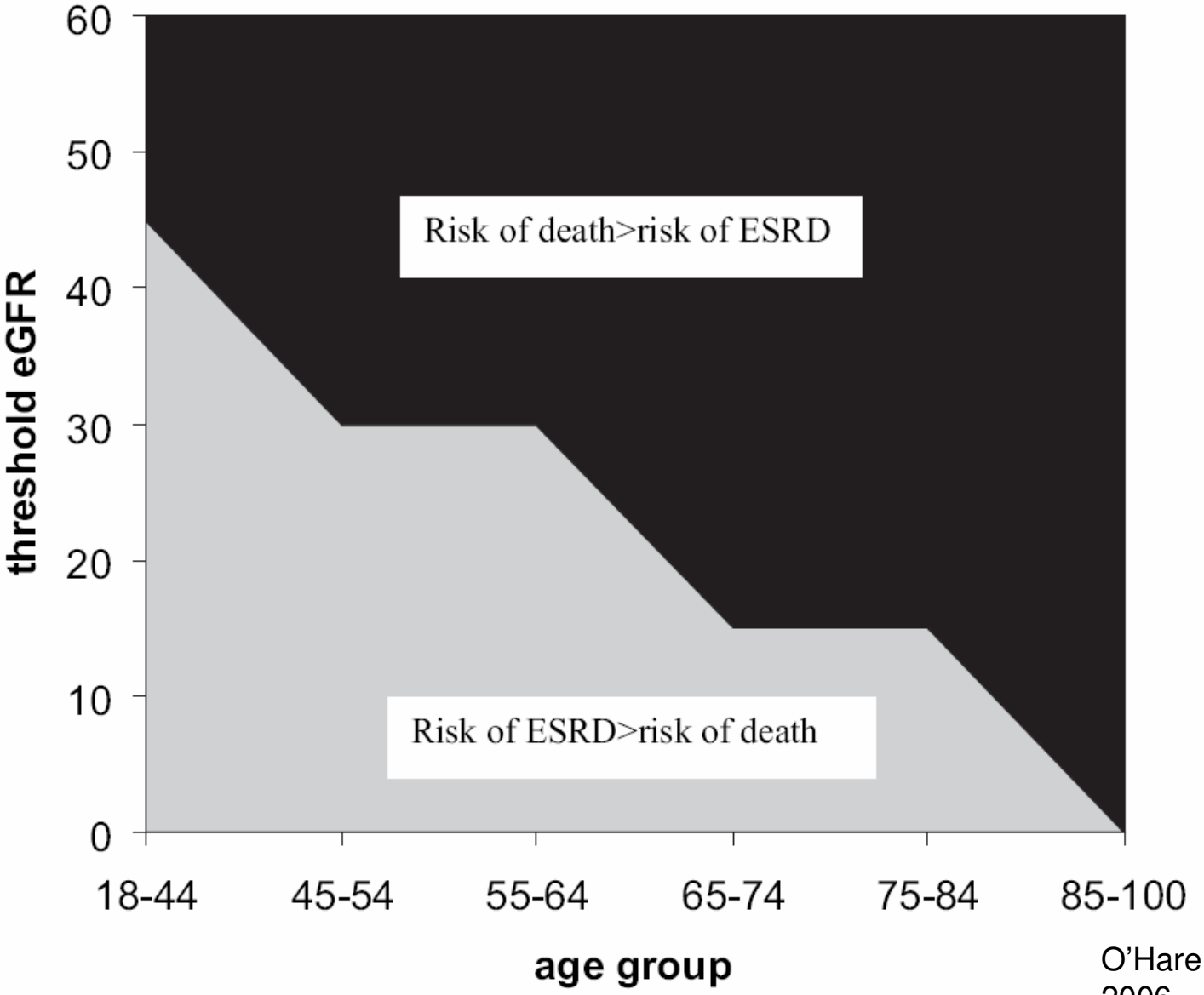
Muntner et al CJASN Vol 6 2011

Cardiovascular outcomes



Debella et al CJASN Vol 6 June 2011

Renal outcomes: progression to ESKD



O'Hare et al JASN 17; 846-853, 2006

Renal outcomes

	eGFR ≥60	eGFR 45–59	eGFR 30–44	eGFR 15–29
Adjusted relative risk				
Normal ACR	1.0 (ref.)	11.7	25.3	120
Microalbuminuria	18.2	60.9	183	765
Macroalbuminuria	110	302	934	982
Absolute risk	Reference	Low risk	Moderate risk	High risk
Incidence rate (per 100,000 person-years)	4	69	586	3,938

Nephron Clin Pract 2 c308
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Renal outcomes

- Risk of progression:
  - AKI
  - Drugs
  - Intervention
  - HT /diabetes

Rate of progression

- Population based study of moderate CKD in Norway found higher rate of change in older v younger patients Eriksen KI 2006; 69 :375-82
- Community dwelling adults in Canada saw relatively low rates of change Hemmelgam KI 2006; 69:2155-61
- Veteran cohort, rates of decline in eGFR decreased with age at eGFR <45 ml/min but increased with age at eGFR >45 ml/min O'Hare JASN 2007; 18:2758

Other outcomes

Associations between:

- Increasing creatinine and loss of lean muscle mass
- Cystatin C by quartile and loss of BMD in men and hip fracture in women
- Reducing eGFR and funfctional limitation
- Increasing microalbuminuria and cognitive decline

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How to manage elderly people with CKD

- Lack of RCT that are relevant to older patients
- RCT performed in younger patients with CKD may not be generalisable to older patients
- The care of these patients should be individualised and incorporated with patient preferences

General medication issues in the elderly

- Multiple chronic medications
- Multiple prescribers
- Comorbid cognitive issues
- In-hospital adverse events
- Underprescribing of indicated medications

Issues related to reduced GFR and drug dosing

Drug levels can be affected by:

- Decreased filtration
- Impaired tubular function
- Altered renal metabolism
- Altered protein binding

When dosing drugs with narrow therapeutic window, confirm which equation was used to produce dosing recommendations

CKD summary

- Creatinine based equations are associated with significant inaccuracy, particularly for the extremes of renal disease and age
- There is a natural loss of GFR with increasing age but this decrease is relatively minor
- GFR < 60 and albuminuria are independent risk factors for death and cardiovascular disease
- GFR < 60 and albuminuria together may stratify risk of progression to ESKD
- In patients recognised to be a moderate or high renal risk, the search for primary or secondary renal disease and vascular risk factors is important.
- General strategies to delay progression are the same as in younger patients but specific therapeutic interventions have not been well trialled in the elderly population

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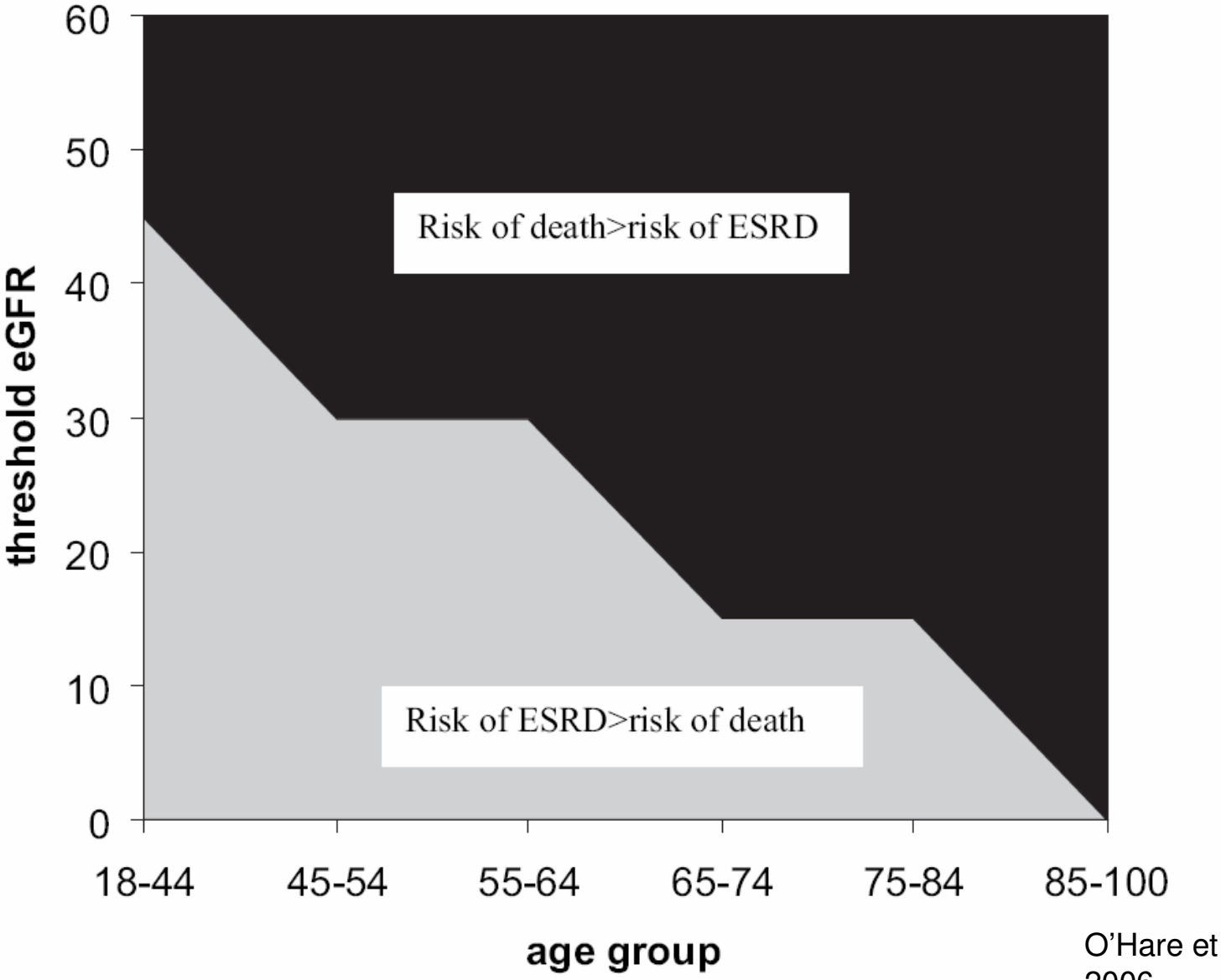
Progression to ESKD

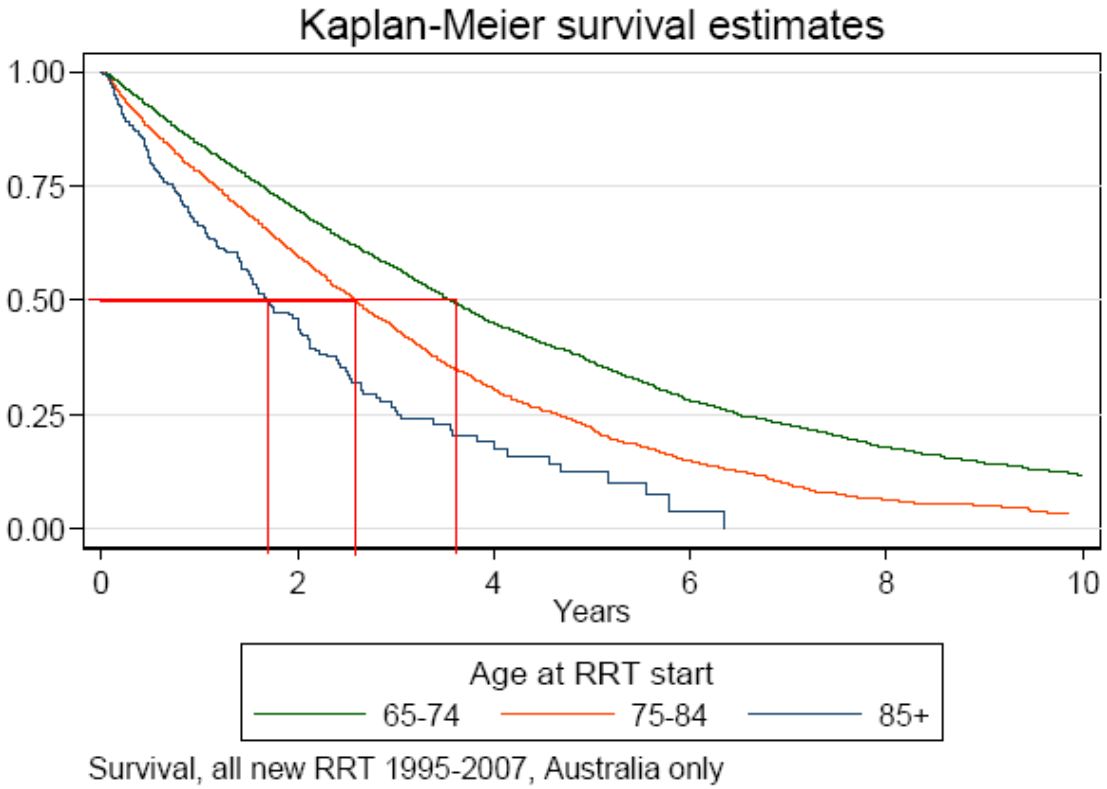


O'Hare et al JASN 17; 846-853, 2006

Management of ESKD

- High mortality rate
- Management options
  - Dialysis
  - Conservative therapy
  - Transplantation

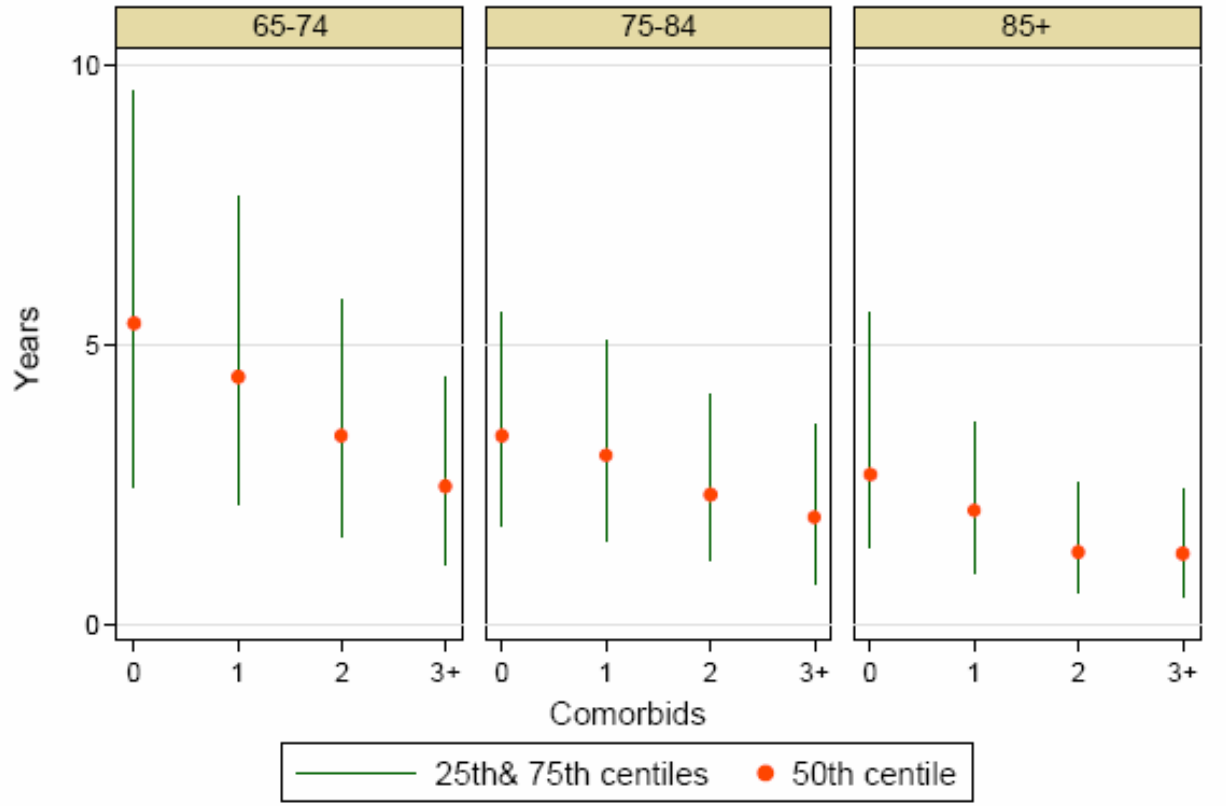
Survival with RRT



Survival, all new RRT 1995-2007, Australia only

ANZDATA 2008

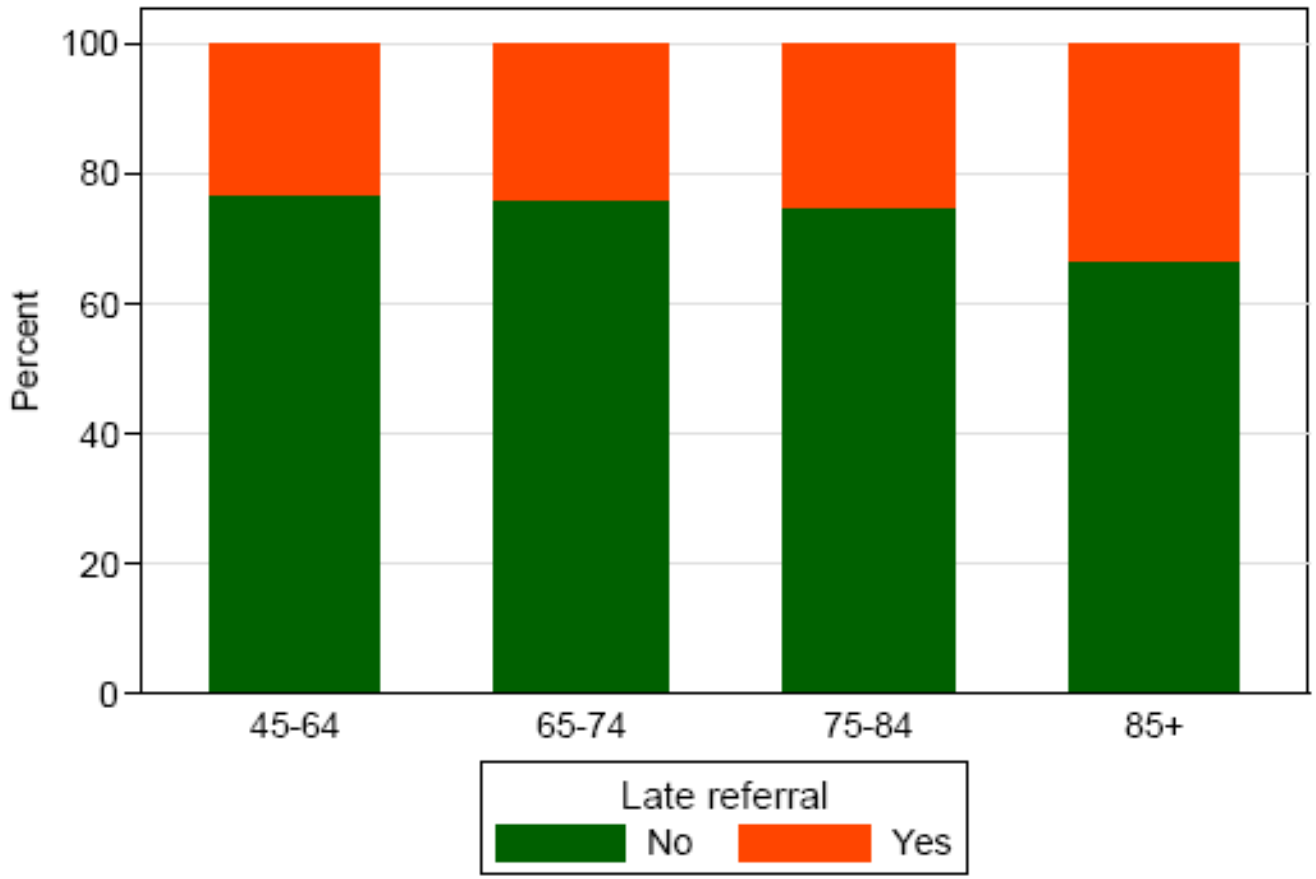
Effects of comorbidities



Survival, Australian new RRT 1995-2007

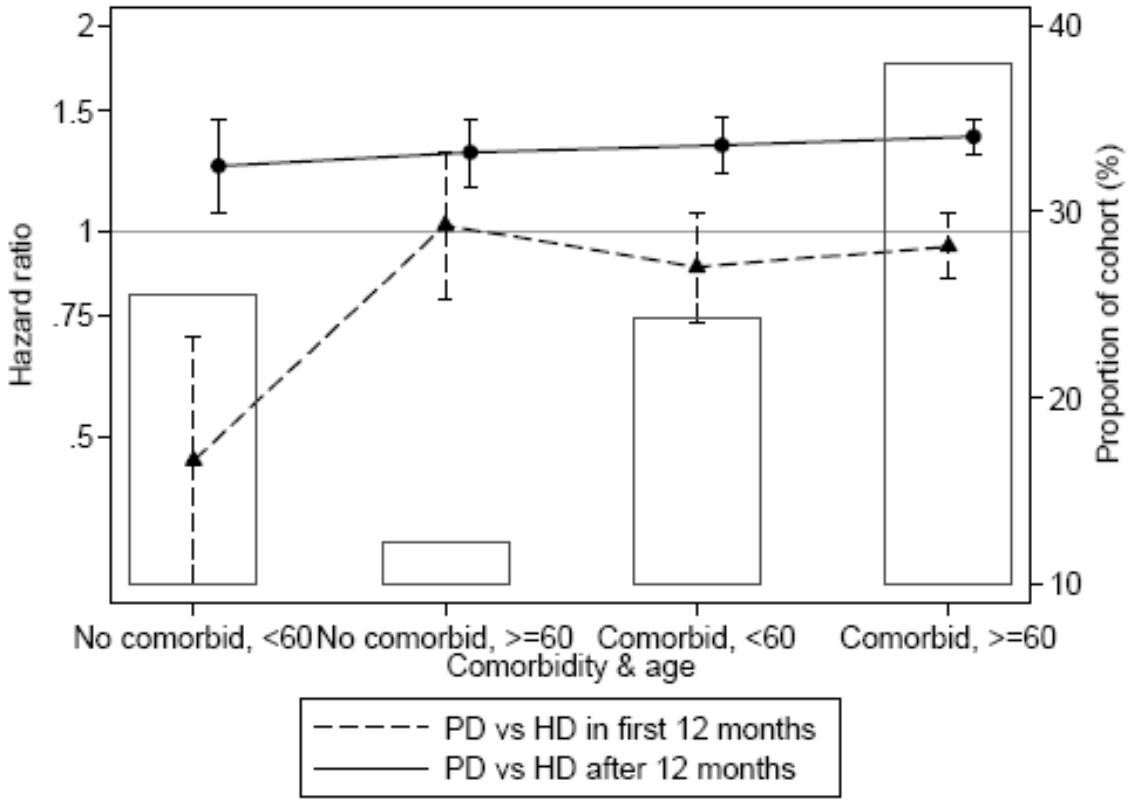
ANZDATA 2008

Are older people referred on time?



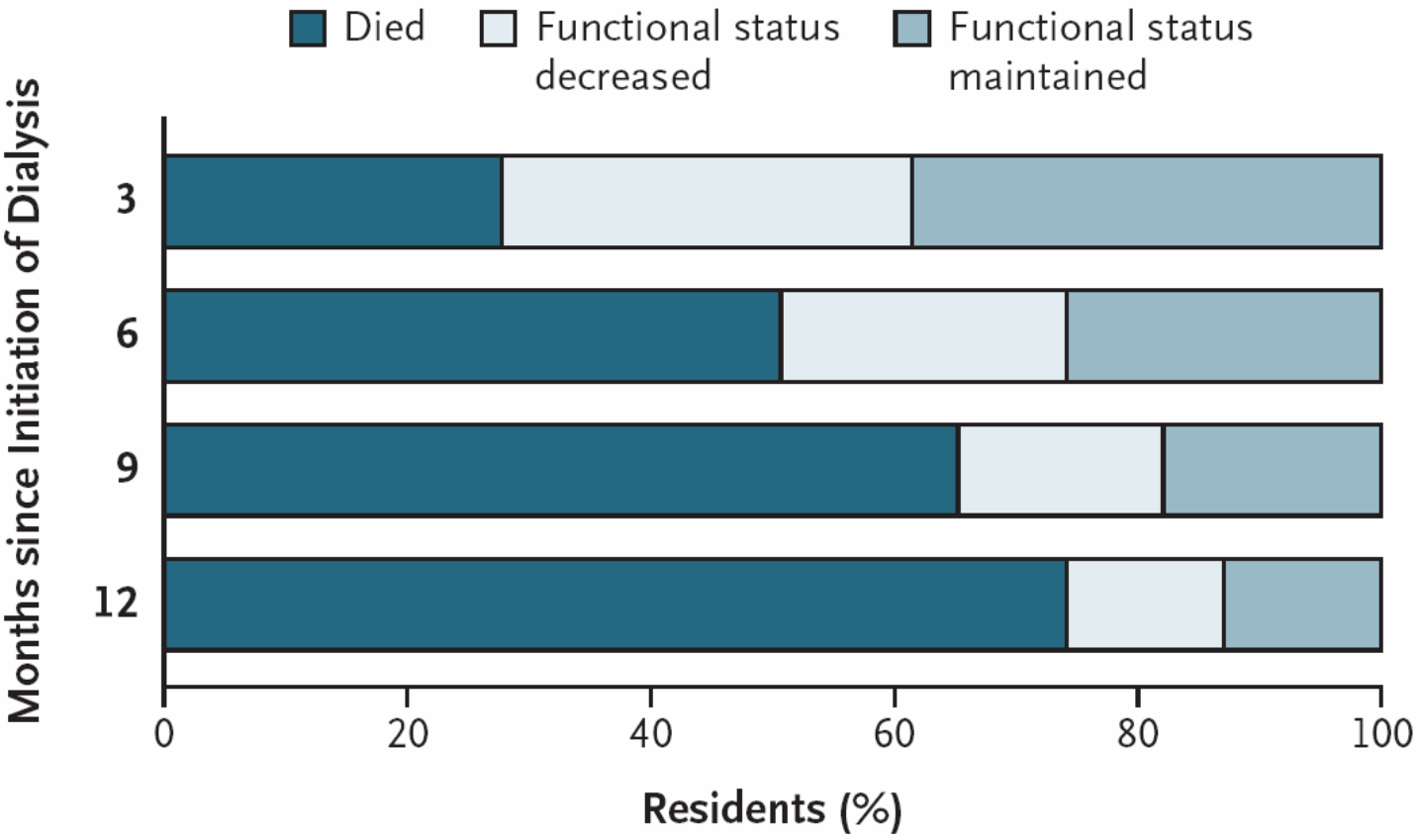
RRT starts, Australia, 2003-7

Which method of dialysis?



McDonald, S et al JASN 2009;20

Dialysed nursing home residents



Tamura NEJM 2009; 361:1539-47

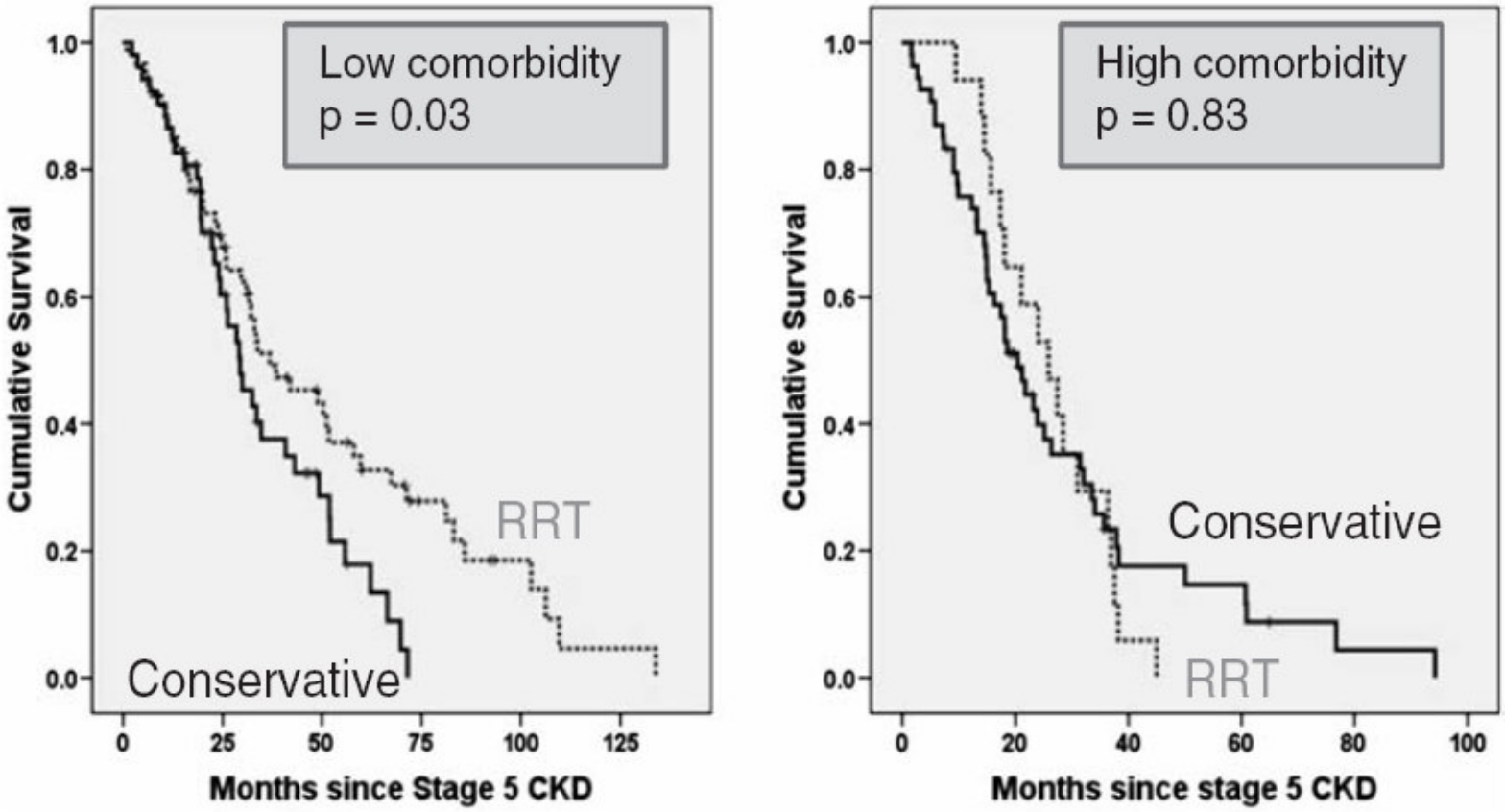
Quality of life

Two studies suggest that although physical well-being is reduced in elderly dialysis patients, mental well being is comparable to younger dialysis patients and to the aged matched general population

Lamping Lancet 2000; 356: 1543-50

Unrih JAmGerSoc 2008;56:1608-17

RRT v conservative care



Chandna et al NDT Nov 2010

Ideal care for elderly people with ESKD

- Accurately identify who is going to reach ESKD
- Amongst those patients, identify who would benefit from dialysis and prepare early
  - Quantity of life
  - Quality of life
- Active conservative management for those who are unlikely to benefit

Individualised patient care

- The priorities of care for an elderly person are different to that of their younger colleagues
- Assess each patients risk of a particular outcome and which outcomes are most important to them
- Identify processes that can be modified
- Early, full and frank discussion