

Dialysis

Acceptance onto Dialysis

5. Comorbidities

CARI Guidelines

- a. A patient's overall state of health should be taken into account when the decision to commence dialysis is contemplated (level C evidence).
- b. The population data relating risk factors to outcome should be available to the clinician, the patient and their family (level C evidence).

Background

In 1997 the number of dialysis patients (all modalities) was 5174 in Australia (ANZDATA). The number of patients on chronic dialysis per million population (279 pmp) differs from those of the USA, UK and other developed countries. The remoteness of some of our populations requires locally acceptable solutions to the increasing demands for renal replacement services. The alarming rate of renal failure in our indigenous populations, from primary and diabetic renal disease poses a challenge for preventive programs as well as for coping with the ever increasing demand. The increasing longevity of our population assures an ever increasing number of older citizens with ESRF who are entitled to equal consideration for health care. There should not be a "target" numbers of dialysed patients set on economic grounds.

To assist patients/guardians in making decisions, it is important that more data be accumulated regarding the risks of demise or of unacceptable morbidity posed to patients by additional medical conditions (co-morbidities) which may be present prior to initiation of dialysis or acquired during the course of dialysis.

Unfortunately, the available data relating risk factors to outcome, are not precise enough to satisfy concerns about predictive reliability. Quoted risks should therefore be used only as a guide for individual decision making.

What is the evidence?

Prediction of Early Death

Barret et al (1) in a multicentre Canadian study prospectively evaluated the utility of a scoring system developed previously in a retrospective study (2) to predict mortality within 6 months of starting dialysis of patients with various co-morbidities. They compared the outcome with clinician's estimation of probability of death and found that physicians were most accurate in assigning patients to prognostic groups where there was up to a 50% risk of death by 6 months, above that, they tended to overestimate risk. The clinician's prognosis was more accurate than the scoring system for those at high risk of death. Ischaemic cardiac disease, unless associate with congestive cardiac failure, was not associated with excess risk of death within 6 months.

Co-morbidity factors examined, odds ratio and 95% confidence limits where available:

Cancer	Odds ratio (death within 6 months)	95% CI
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Primary	2.3	0.8-6.7
Metastatic	34.1	5.2-225

Peripheral Vascular Disease	Odds Ratio (death within 6 months)	95% CI
Not severe	2.2	1.3-3.9
Severe	4.7	1.8-12

Age	Odds Ratio (death within 6 months)	95% CI
< 50	1.0	
>50-60	0.8	0.3-2.2
>60-70	2.4	1.1-5.2
>70	5.0	2.4-10.5

Avram et al. (3) used a proportional hazard model based on data recorded at enrolment of patients with CAPD and haemodialysis and followed for up to 72 months.

Diabetes present	Odds ratio (risk of mortality over 72 months)	95% CI
1.5		1.1—2.31

Age	Odds ratio (risk of mortality over 72 months)	95% CI
<50	reference	
50-74	1.5	1.07—3.12
>75	3.4	1.74—6.66

Khan et al (4,5) retrospectively stratified dialysis patients into low, medium and high risk categories, based on co-morbidity (and to a lesser extent age). They compared the two year survival of each group after exclusion of patients who died within 90 days of renal replacement therapy commencement.

They combined age and other co-morbidity factors to categorise patients into:

- **Low risk:** Age <70 and no co-morbidity factors
- **Medium risk:** Age 70-80 with any one of cardiac, pulmonary and liver diseases, or age <70 and diabetic.
- **High risk:** Age >80, or any age with two or more organ dysfunction, or any age with diabetes and cardiopulmonary disease, or any age with visceral malignancy.

Risk Group	Odds ratio	95% CI
Low	reference	
Medium	3.8	2.7—5.4
High	6.2	4.2—9.1

Iseki et al (6) carried out a cross-sectional analysis for co-morbid factors and followed up dialysis

patients to determine proportional hazards.

Age	Hazard ratio	95% CI
0—34	1.00 (reference)	
35—44	1.50	1.4—1.6
45—54	2.25	1.97—2.57
55—64	3.37	2.77—4.12
65+	5.06	3.88—6.60
Diabetes	1.82	1.48—2.23

Sesso et al (7) examined ESRD patients who received or did not receive dialysis in 1991. They found that age was an important factor for NOT being accepted onto dialysis.

Age	Odds ratio (Likelihood of acceptance)
0—9	34.13
10—19	1.92 (ns)
20—29	1.00 (reference)
30—39	1.86 (ns)
40—49	2.43 (ns)
50—59	4.36
60—69	6.21
70—79	15.25
>80	75.33

Byrne C et al (8) compiled data from the Medicare-funded ESRD programme in the USA for patients 55yrs or older who began chronic dialysis between 1982-7. They also compiled information with regards to the four commonest causes of end stage renal failure. They concluded that mortality in dialysis patients increased dramatically as a function of advancing age beyond 55 compared to the general population. Older dialysis patients with diabetes fare particularly badly. No dialysis patient over 85 with diabetes survived 5 years.

In a retrospective analysis of mortality risk and co-morbid conditions in 3399 haemodialysis patients over 15 years of age (9), death occurred in 1847 and 454 were transplanted. Using Cox proportional hazard significant relative risks for mortality were: (confidence intervals not given)

Factor	Relative risk (mortality)
Coronary Artery Disease	1.22
Congestive Cardiac Failure	1.26 (ns)
Diabetes Type 1	1.77
Diabetes Type 2	1.42
History of Neoplasm	1.42
Age (for each 10y > the average age 59.2yrs)	1.37

Kjellstrand et al. (10) compared acceptance and mortality figures of patients in Stockholm and Minnesota with respect to presence or absence of 10 co-morbidity factors. They noted an improvement in survival in more recently dialysed patients, however 5 year survival of patients with co-morbidities was 25% vs 45% (USA vs Sweden) and 75% vs 85% respectively in those without

co-morbidities. The average age of the USA cohort was significantly older 59 vs 43 in Sweden. They also remarked that a "fastidious approach to acceptance will lead to good survival", and even better figures will be apparent from centres that exclude the elderly and those with co-morbidities. An active transplant service will also leave behind those with higher levels of illness and lead to poor survival figures.

Chandna et al (11) reported on a retrospective analysis of patients (n=292) who were accepted to their dialysis unit over a four year period. They scored major co-morbid conditions (cardiac disease, peripheral vascular disease, cerebrovascular disease, respiratory disease) on a scale of 1-4; 1 being mild and 4 disabling. They also looked at age. 129/292 (40%) of the patients died in the first year on dialysis. They contended that diabetes was not a significant predictor of medium term survival. Additionally, they calculated cost reduction based on non-acceptance for dialysis of high and medium risk patients based on co-morbidity scores over 1 year survival.

They conclude that limited cost savings could be generated by denying access to dialysis of high risk patients, but long term survivors may be sacrificed.

Keane WF et al (12) reviewed survival data of 1346 non-diabetic patients and 1094 diabetic patients on dialysis with respect to co-morbid factors at initiation of dialysis.

	Non-Diabetic		Diabetic
Age	61-75 yrs	>76 yrs	>76 yrs
RR	1.00	1.53	1.85
Cancer	1.53		
COPD	1.22		1.51
PVD	1.72		1.37
CHF	1.33		1.33

COPD:chronic obstructive pulmonary disease, PVD:peripheral vascular disease, CH:congestive cardiac failure

Port FK (13) tabled acceptance criteria in Michigan:

- In 1972-1973 <65 yrs, No system disease
- From 1991: Any patient benefiting from therapy

What do the other guidelines say?

DOQI: No discussion of co-morbidity and acceptance >

BRA: The British Renal Association (BRA) recommendations are to "achieve an annual acceptance rate of new patients with renal failure of 80 pmp, adjusted upwards as necessary for ethnic and age distribution of the population".

The BRA notes that survival on renal replacement therapy is profoundly influenced by co-morbidity factors, especially age, diabetes, ischaemic and congestive heart diseases, and peripheral vascular disease. They note after an extensive study of the database of European Renal Association, that a simple system of risk classification into three groups of patients is possible:

Median survival after 1 year

	on dialysis (years)
Standard risk: non-diabetic, under 55y	14.2
Medium risk: non-diabetic, 55-64y or diabetic 15-54y	7.4
High risk: non-diabetic > 65y; diabetic >55y; HIV patients	3.5

They conclude, however "that the presence of co-morbidity is not a contraindication to treatment".

CSN: No discussion of co-morbidity and acceptance.

Implementation and Audit

1. Analysis of current ANZDATA co-morbidity factors and outcomes in Australia and New Zealand as well as prospective collection of data.
2. Development of defined, significant co-morbidity factors or risk categories relevant to our countries.
3. Defining relative risks based on outcomes from prospective and retrospective analysis of ANZDATA.

Suggestions for Future Research

1. Patients' demographics and their co-morbidity factors at start of dialysis.
2. Patients' reasons as to choice of type of dialysis.
3. Co-morbidity factors - in Australia and New Zealand of patients whose renal function warrants long-term dialysis management, but who are had not been offered dialysis.
4. Co-morbidity factors - in Australia and New Zealand of patients whose renal function warrants long-term dialysis management, who refused dialysis.
5. Physician reasons and patients' reasons for not accepting long-term dialysis therapy.
6. Numbers, demographics and co-morbidity factors of patients who elect to discontinue dialysis.
7. Prospectively assess outcome on all patients with ESRF presenting for, or refusing dialysis. Analysis of accuracy of probability of death models based on individual and combinations of co-morbidity factors.
8. Estimated costs of acceptance onto dialysis of patients with co-morbidity factors.