



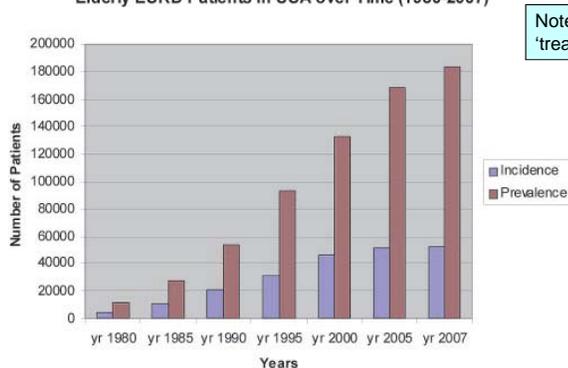
# How do the elderly fare on dialysis?

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# Growth in the elderly ESRD population

Elderly ESRD Patients in USA over Time (1980-2007)

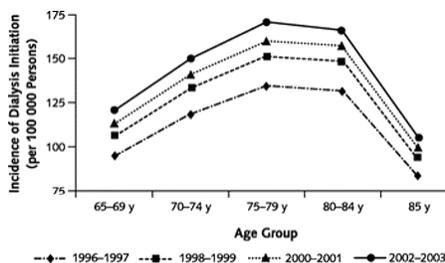


Note: this reflects 'treated' patients

1 in 4 patients starting dialysis in the US is > age 75 years



Dialysis initiation among octogenarians and nonagenarians increased dramatically from 1996 to 2003, translating to a near doubling of the number of patients with incident ESRD who are older than 80 years of age



Dialysis was initiated at higher eGFR over time

Kurrela M et al Ann Int Med 2007; 146: 177-183

## Explaining the rising incidence of ESRD

- Age-related changes in the incidence of CKD
- Co-morbid conditions (diabetes and hypertension)
- Improved survival from cardiovascular disease
- Broader access to ESRD care
- Earlier initiation of renal replacement therapy
- Rising incidence of acute kidney injury with non- or partial recovery of renal function
- Others (?)
  - Time constraints/barriers to communication of other alternatives
  - Lack of palliative care training
  - Financial incentives favoring dialysis care over palliative options

## Survival after dialysis initiation

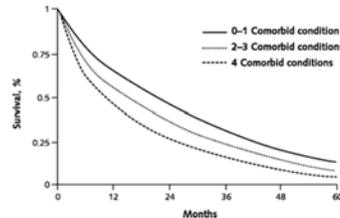
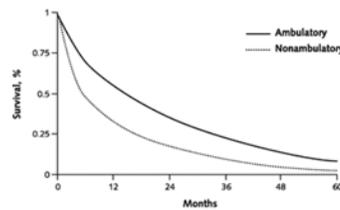
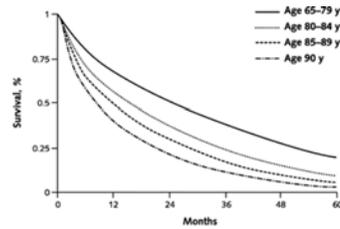
Age group (years)	Median Survival (months)
80-84	15.6
85-89	11.6
≥ 90	8.4

Data source: USRDS annual data report

Observational data suggest that survival of elderly patients starting dialysis is 2 to 20 months longer than that of elderly persons patients from whom dialysis is withheld



Only 54% of the cohort was alive at 1 year.



Kurrela M et al Ann Int Med 2007; 146: 177-183



## Survival is not uniform

- 20 French HD centers, 290 stable HD patients aged > 75 years
- Overall survival rates:
  - 80% at 1 year
  - 65% at 2 years
- Survival influenced by:
  - Age, albumin, prealbumin, body mass index, diabetes
- In Canada: patients aged 75-80 yrs had 14% increase in life expectancy in the era 1995-99 compared with those who started dialysis in 1990-1994

Chauveau et al. Am J Kidney Dis 2001; 37: 997-1003

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

## Survival after dialysis initiation

- Mortality is not constant over time
  - Nearly 20% of patients (age  $\geq$  80 yrs) die within the first 3 months after dialysis initiation (twice the rate as patients aged 65-79 years)
  - Raises important questions:
    - Is dialysis life-extending? Selection-bias in being selected for dialysis
    - Can we identify those patients at high risk of early mortality?
      - Reduced functional status
      - Low body weight
      - Number and severity of comorbid conditions
      - Late referral
      - Unplanned dialysis initiation
    - Do current care guidelines remain applicable to the elderly patient?



## Dialysis v. Non-Dialysis

- Few studies (6) comparing survival (non-randomized)
- Varying patient characteristics, rates of dialysis initiation and survival estimates
- Regional differences in referral patterns
- In most of the studies, dialysis was initiated later in the course of CKD and median survival was longer than patients in the US
- **Suggests that:** (a) more stringent criteria for acceptance into dialysis in these cohorts or (b) whether US dialysis programs are initiating dialysis in patients who would otherwise die from competing causes.

Kurella Tamura Curr Opin Nephrol Hypertens 2009; 18: 252-7



## Dialytic v. Nondialytic Therapy

Study	GFR at decision point	Age (years)	% dialysis v. non-dialytic	12-month survival	
Joly et al.	10 ml/min	> 80	107 (D) 37 (ND)	74% (D) 29% (ND)	Median survival 20 mo longer
Murtagh et al.	15 ml/min	> 75	52 (D) 77 (ND)	84% (D) 68% (ND)	

Dialysis extends survival but at what cost?

Joly et al. J Am Soc Nephrol 2003; 14: 1012-1021

Murtagh et al. Nephrol Dial Transplant 2007; 22: 1955-1962

## University College London Center for Nephrology Study

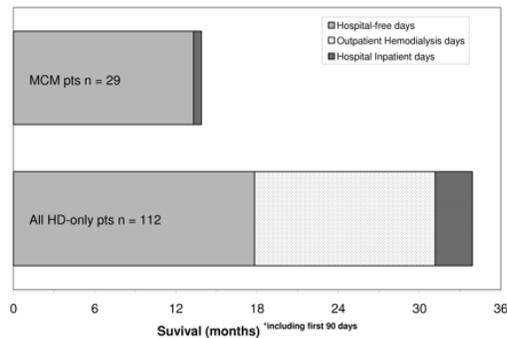
- A growing number of nephrology programs in the United Kingdom are offering ongoing follow-up and multidisciplinary support to patients who have ESRD and choose not to start dialysis. It has been variously described as 'conservative management,' 'maximum conservative management' (MCM), nondialysis treatment, and 'palliative renal care'
- Compared clinical outcomes for a single-center cohort of 202 elderly (70 yr) patients who had ESRD and chose either MCM or RRT
- Average GFR 10.8 ml/min

Carson, R. C. et al. Clin J Am Soc Nephrol 2009;4:1611-1619



## Results

Distribution of Days Survived:  
Hospital-free Days, Outpatient Hemodialysis Days  
and Hospital Inpatient Days



Dialysis prolongs survival for elderly patients with significant comorbidity by approximately 2 yr; however, patients who choose MCM can survive a substantial length of time, achieving similar numbers of hospital-free days to patients who choose hemodialysis.

## Important points

- **In studies examining dialysis v. conservative therapy:**
  - Among those with high comorbidity or with ischemic heart disease, survival is generally equivalent between those choosing dialysis and nondialysis
  - Smith et al found that there was NO difference in survival in the group that was recommend no dialysis but ultimately chose to receive dialysis compared with those receiving nondialytic management.
  - Non-randomized studies

Smith et al Nephron Clin Pract 2003; 95: c40-c46

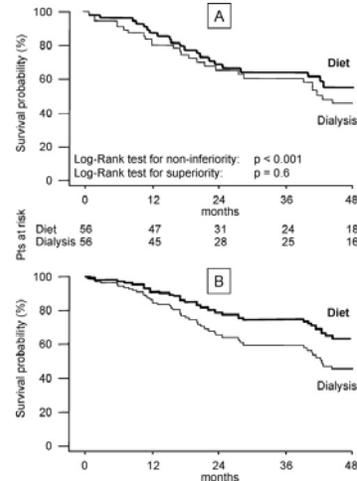
## Dietary protein restriction as an alternative

- Investigated the safety of delayed initiation of dialysis when combined with a supplemented very low protein diet versus immediate dialysis initiation in 112 patients (age > 70 yrs) with estimated GFR 5-7 ml/min.
- Excluded diabetics, those with CHF, cancer, liver disease, acute life-threatening diseases.
- Vegan diet, 35 kcal/kg with 0.3 g/kg protein with supplemental keto-analogues, amino acids and vitamins

Brunori G et al. Am J Kidney Dis 2007; 49: 569-580

## Protein restriction

- Selected elderly patients can survive for a median interval of 10 months without dialysis by adhering to a nearly protein-free diet
- Remains to be seen whether these results can be reproduced in patients with outcome rates and quality of life issues similar to those of the US population



Brunori G et al. Am J Kidney Dis 2007; 49: 569-580

## Defining predictors of good outcome

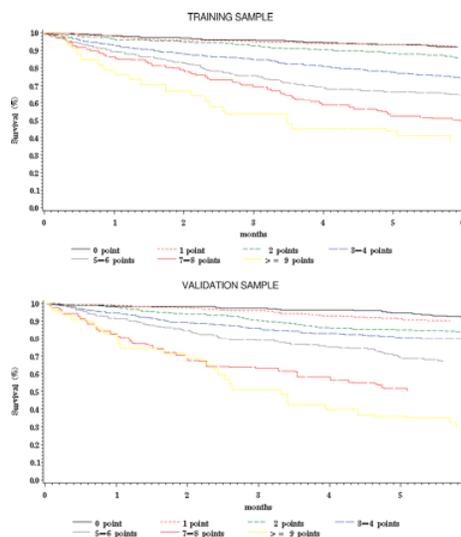
- Prospective studies to define predictors of good outcomes in the elderly patient approaching the need for dialysis are needed
- Are we starting too late?
  - Are the markers of uremia different in the elderly?
  - Do the indications for dialysis differ in the elderly v. younger patients?

## A clinical score to predict 6-month prognosis in elderly patients starting dialysis

- Using French Registry data:
  - Nine risk factors identified: body mass index (< 18.5 kg/m<sup>2</sup>); diabetes, congestive heart failure, peripheral vascular disease, dysrhythmia, active malignancy, severe behavioral disorder, total dependency for transfers and need for unplanned dialysis.
  - This simple clinical score effectively predicts short-term prognosis among elderly patients starting dialysis. It should help to illuminate clinical decision making, but cannot be used to withhold dialysis. It ought to only be used by nephrologists to facilitate the discussion with the patients and their families.

Couchourd et al. Nephrol Dial Transplant 2009; 24: 1553-61

## Use of the prognostic score



Couchourd et al. Nephrol Dial Transplant 2009; 24: 1553-61



## The "surprise" question

- Investigated whether the "surprise" question, "Would I be surprised if this patient died in the next year?" identifies patients who are at high risk for early mortality
- Prospective cohort of 147 patients in 3 dialysis units

Moss et al Clin J Am Soc Nephrol 2008; 3: 1379-1384

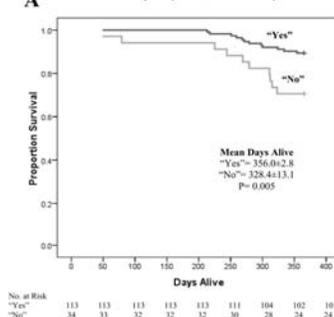


The odds of dying within 1 yr for the patients in the "no" group were 3.5 times higher than for patients in the "yes" group.

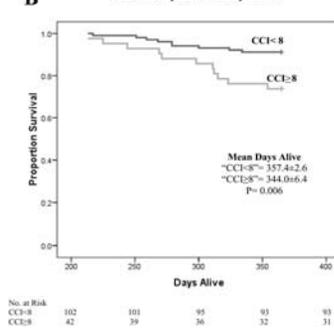
May be a simple, ancillary screening tool that can be applied monthly in the dialysis unit on rounds

Moss et al Clin J Am Soc Nephrol 2008; 3: 1379-1384

**A** Survival by Surprise Question Response



**B** Survival by Comorbidity Score





## Predicting 6-month mortality for maintenance hemodialysis patients

- Developed a short-term prognostic model in 512 patients
- Multivariate analysis identified 5 variables:
  - Older age (HR per 10 year age increase of 1.36)
  - Dementia (HR of 2.24)
  - Peripheral vascular disease (HR of 1.88)
  - Decreased albumin (HR for a 1-u increase 0.27)
  - “No” answer to surprise question (HR of 2.71)
- Area under the curve for the resulting prognostic model predictions of 6-mo mortality were 0.87 (95% CI 0.82 to 0.92) in the derivation cohort and 0.80 (95% CI 0.73 to 0.88) in the validation cohort

Cohen et al Clin J Am Soc Nephrol 2009; 5: 72-79



## Quality of Life

- North Thames Dialysis Study
  - 12-month prospective cohort study of outcomes in 221 patients with end-stage renal failure aged 70 years or over recruited from four hospital-based renal units.

SF-36 score	NTDS patients ≥70 years		General UK population ≥70 years (n=333)	General US population	
	New patients* (n=78)	Stable patients† (n=96)		65-74 years (n=442)	≥75 years (n=264)
PCS	24.0 (10.8)	28.2 (10.7)	41.0 (12.5)	43.8 (11.2)	37.9 (11.2)
MCS	50.7 (11.4)	51.3 (10.8)	53.4 (9.4)	52.7 (9.3)	50.4 (11.7)

Values are mean (SD). \*At 90 days of uninterrupted dialysis from first dialysis. †At 3 months-10.8 years after first dialysis.

PCS: physical quality of life

MCS: mental quality of life

Lancet 2000; 356: 1543-1550



## Quality of Life

- **HEMO Study**

- Health related quality of life surveys
- Compared subjects > 70 years with those aged 55-69 and 18-54 years
- At baseline, elderly HD patients had lower PCS scores and similar MCS scores to young and middle-aged participants.
- Over 3 years of follow-up there were small declines in these parameters and there was no substantial relationship between age and average decline in HRQOL score over 3 years in participants in the HEMO Study.

Unruh M J Am Geriat Soc 2008; 56: 1608-1617



## Functional Status of Elderly Adults Before and After Initiation of Dialysis

- Using a national registry of patients undergoing dialysis, linked to a national registry of nursing home residents, 3702 nursing home residents in the United States who were starting treatment with dialysis between June 1998 and October 2000 and for whom at least one measurement of functional status was available before the initiation of dialysis
- Functional status was measured by assessing the degree of dependence in seven activities of daily living (on the Minimum Data Set–Activities of Daily Living [MDS–ADL] scale of 0 to 28 points, with higher scores indicating greater functional difficulty).

Tamura et al. New Engl J Med 2009; 361: 1539-1547



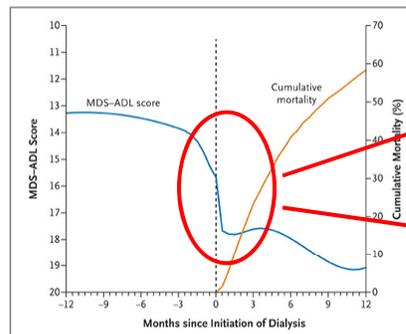
## Functional Status

- **Key points:**

- Within 3 months after the start of dialysis, 61% of nursing home residents had died or had a decrease in functional status.
- Only 39% had the same functional status that they had before dialysis
- By 12 months, 87% of residents had died or had a decrease in functional status. Only 1 in 8 maintained status
- Factors associated with decline: older age, white race, cerebrovascular disease, dementia, hospitalization at the start of dialysis and serum albumin < 3.5 g/dL
- Even if dialysis can extend lives of NH residents, it does not restore health or functional status

Tamura et al. New Engl J Med 2009; 361: 1539-1547

## Trajectory of changes in functional status and mortality



Marked changes at the time of dialysis initiation

Time of high risk and may need to be specifically targeted

Tamura et al. New Engl J Med 2009; 361: 1539-1547

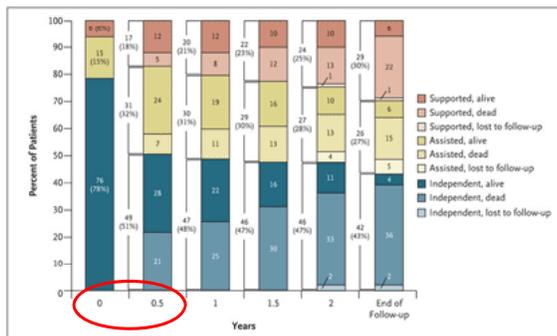
## Why does functional status decline with dialysis?

- High prevalence of baseline disability and comorbidity (stroke, PVD, dementia)
- May be a consequence of hospitalization at/around time of dialysis initiation (Lo et al. Am J Kidney Dis 2008; 52: 956)
- Benefits of correcting uremia may be outweighed by physical risks associated with dialysis and psychosocial burden
- Dialysis may lead to changes in beneficial therapy (less time for physical therapy, meals, social interaction).
- Dialysis may lead to dizziness, fatigue, or cramping which may interfere with rehabilitation
- Renal failure may be part of an inevitable decline and multi-organ failure that can not be rescued with dialysis

## Loss of independence with dialysis initiation

- Single center, retrospective cohort study followed progress of patients age > 80 years in whom long-term dialysis was initiated.
- Assessed changes in living status and functional loss in 97 pts with mean age of 84.5 years
- Peritoneal dialysis used in 44%
- At the time of dialysis initiation majority living at home however within the first 6 months after dialysis initiation, more than 30% had functional loss requiring a new level of support
- However, over the next 2 years, the number of patients who remained independent remained stable

## Transition period to dialysis is a critical time



Jassal et al New Engl J Med 2009; 361: 1612-1613

## Other issues: Frailty and falls,

- **Frailty:** defined as 3 out of the following:
  - unintentional weight loss, self-reported exhaustion, slow gait speed, weakness and low physical activity
  - Inverse relationship between eGFR and prevalence of frailty
  - Dialysis Morbidity and Mortality Study Wave II
    - All ages: frailty prevalence of 67.7%
    - Age > 80: frailty prevalence of 78.8%
  - Strongly associated with high mortality rates, increased hospitalization rates

Shiplak et al. Am J Kidney Dis 2004; 43: 861-867

Johansen et al J Am Soc Nephrol 2007; 18: 2960-2967



## Falls

- Incidence rate of 1.2-1.6 falls/year in dialysis patients age > 65 years
- Falls associated with 2-fold increased risk for mortality
- Precipitants likely include:
  - Comorbid conditions
  - Dialysis-related (blood pressure changes)
  - Multiple medications

Cook et al Clin J Am Soc Nephrol 2006; 1: 1197-1204

Li et al Nephrol Dial Transplant 2008; 23: 1396-1400



## Summary

- Dialysis is often life-sustaining and promoted as such
- Recognition that dialysis may also be burdensome
- In fact, for those aged > 65 yrs, the prognosis with dialysis is similar to that of colorectal cancer and marginally better than lung cancer
- It is imperative that the limits of dialysis are discussed as well as the potential impact of dialysis on functional and cognitive ability
- Requires a more extended and in-depth discussion with patients about realistic goals and expectations.

Jassal SV et al Clin J Am Soc Nephrol 2008; 4: 2008-2012

## Summary

- Goal is to distinguish which patients are good dialysis candidates and who would do poorly—unfortunately, this is often difficult
- Requires careful individual assessment
- Will require new set of skills in Nephrologists
  - “Nonaggressive renal care” as an intensive approach that prioritizes comfort with active care
  - Will require changes in the training of fellows
    - Management of pain, depression
    - Management of renal-specific symptoms (itching, anorexia, dyspnea, etc)