DIALYZING THE ELDERLY

Are the risks different than with the young?

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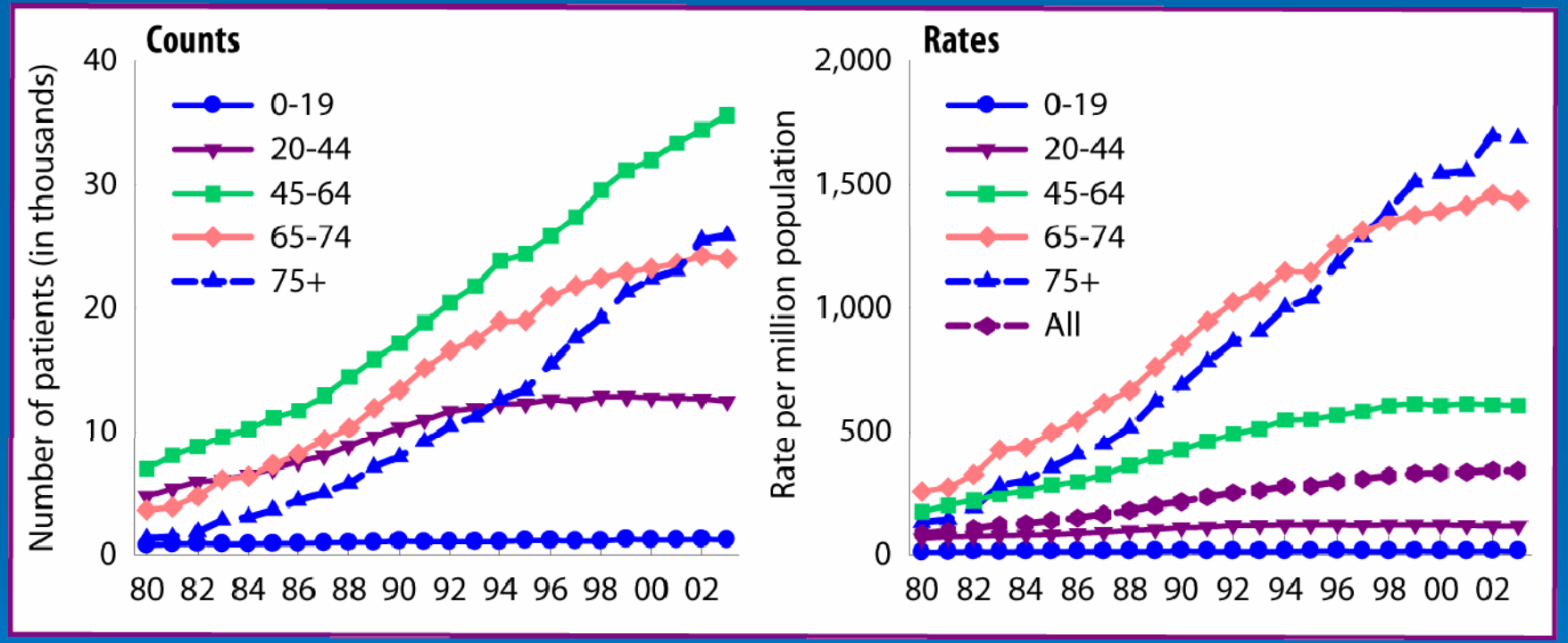
Dialyzing the Elderly: Objectives

- To understand the magnitude of the "burden" of elderly patients with ESRD
- To understand the different risks/special conditions of dialyzing and caring for this population
- To understand the opportunities for improvement of the care of the elderly with ESRD

DIALYZING THE ELDERLY

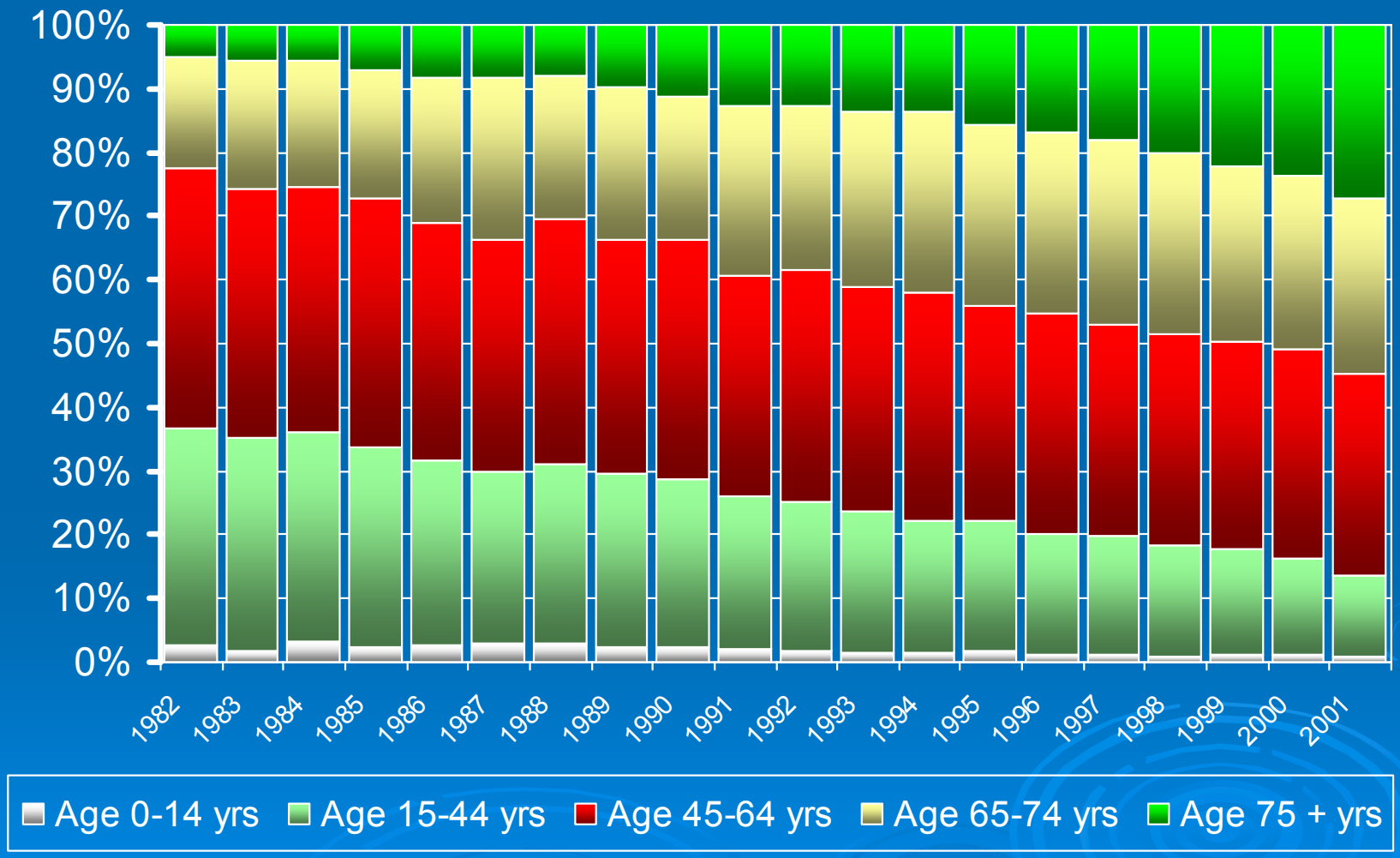
Incident ESRD counts & adjusted rates by age

Figure 2.5



Incident ESRD patients. Rates adjusted for gender & race.

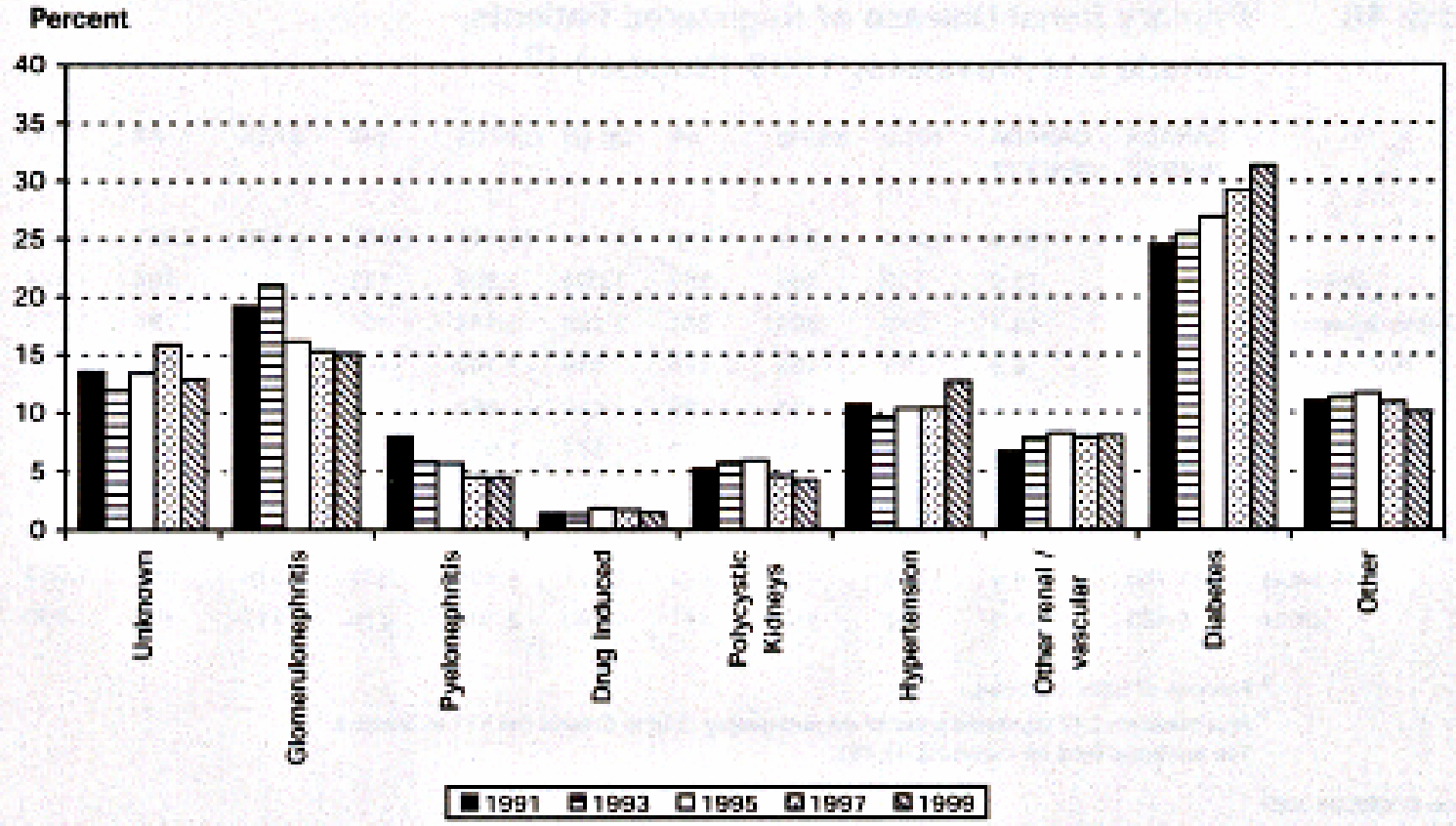
Distribution of Incident ESRD Patients by Age Group, Canada, 1982-2001



Source: Canadian Organ Replacement Register, Canadian Institute for Health Information (2003)

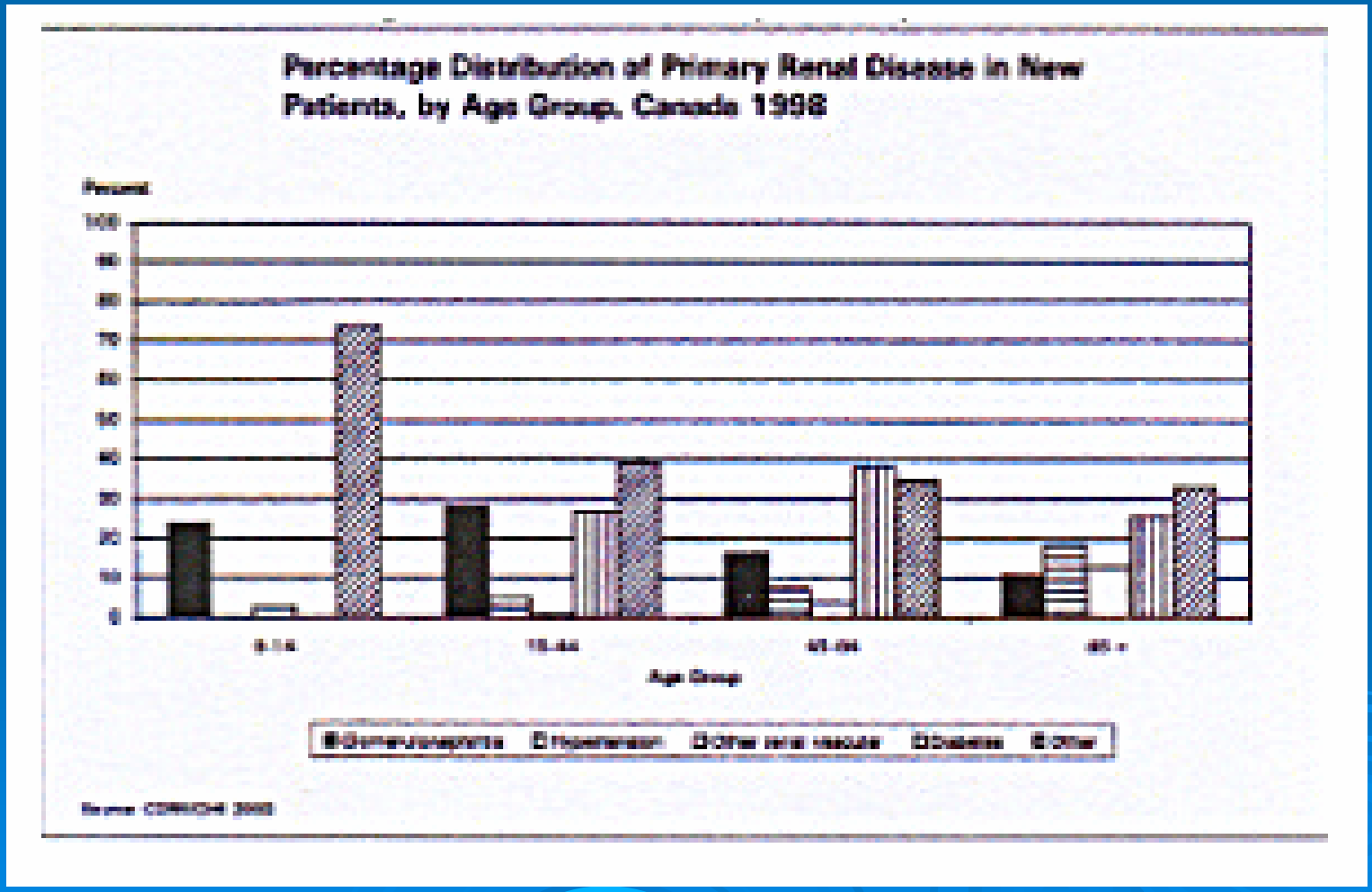
Types of 1ry Renal Disease

Figure 39 **Percentage Distribution of Primary Renal Diseases in New Patients, Canada, 1991, 1993, 1995, 1997, 1999**



Source: CORR/CIHI 2001

% DISTRIBUTION OF 1ry RENAL DISEASE IN NEW PTS BY AGE



RENAL DIAGNOSES IN THE ELDERLY

- Nephrosclerosis
- Renal artery stenosis
- Hypertension
  - Relatively less diabetes as 1ry causes of ESRD

COMORBID CONDITIONS

- Increased in the elderly
- 65% of patients have >/= 2 comorbidities
- 80% of patients have >/= 3 comorbidities
- Diabetes is not included as a comorbidity but as a cause
- One older study found an average of 7.8 comorbidities in an inner city population

Krishnan *et al*, Seminars in Dialysis 15: 2002: 79-83, Dimkovic,Roscoe, Brissenden, Oreopoulos *et al,* Nephrology Dialysis Transplantation 16: 2001: 2034-2040, Ifudu *et al,* JAMA 271: 1994:

COMORBID CONDITIONS

- Cardiovascular
- Musculoskeletal
- Neurological

Jassal, Brissenden, Roscoe Clin Neph 50(2):84-89, 1998

COMORDID CONDITIONS

- Cardiomyopathy
  - Ischaemic
  - Dilated
  - Hypertrophic
    - Hypertension
    - Anemia
- Progression of peripheral vascular disease

COMORBID CONDITIONS

- Do these conditions add special /different risks?
- Yes

Diabetes

COMPLICATIONS/SPECIAL CONDITIONS

- Dialysis hypotension 20-30% of dialysis treatments
- Frequency increases with age
- In elderly-not benign
- Frequently sudden and profound
  - Loss of mentation, consciousness, seizures
  - Often no prodrome (sweating, tachycardia, apprehension)
- Can occur with minimal extracellular fluid loss
- More difficult to reverse in the elderly than in the young

Ismail, Oreopoulos AJKD 122: 1993: 759-782

COMPLICATIONS/SPECIAL CONDITIONS

- Sequelae of Hypotension:
- Seizures
- Myocardial ischaemia
- Aspiration pneumonia
- Vascular access thrombosis
- Organ ischaemia

HYPOTENSION ETIOLOGY

- Multifactorial
- Removal of fluid from intravascular space more rapidly than refilling rate
- Inability to increase peripheral vascular resistance adequately
- Causes of slow vascular response include autonomic dysfunction, low cardiac reserve

HYPOTENSION ETIOLOGY

- Postprandial state
- Inability to increase cardiac output to compensate for reduced total peripheral vascular resistance when undergoing an obligatory increase in splanchnic blood flow

RECOMMENDATIONS: PREVENTION OF HYPOTENSION

- Frequent assessment of dry weight
- Avoid net ultrafiltration of greater than one litre per hour
- Midodrine
- Avoid antihypertensives predialysis
- No food prior to and during dialysis
- Dialysate Na and UF profiling, nutrition
- Cool dialysate

COMPLICATIONS/SPECIAL CONDITIONS: POOR NUTRITION

- 20% of elderly on dialysis have moderate to severe malnutrition
- Indices-non fluid weight loss
- Low serum albumin (<40)
- Low PCR (<0.8 Gm/Kg/D)
- Body weight <80% of ideal weight
- Low Serum Cr, Urea

Wolfson, Seminars in Dialysis 15: 2002 113-115

POOR NUTRITION INDICIES

- Marked reduction of anthropometric measurements
  - Skin fold thickness
- Low cholesterol, transferrin concentration
- Low predialysis K and P
- Low prealbumin concentration

RISK FACTORS FOR NUTRITION

- Low income
- Social isolation
- Lack of understanding of nutritional requirements
- Malabsorption
- Ill-fitting dentures
- Depression
- Drug effects

RISK FACTORS FOR NUTRITION

- Impaired taste acuity
- Anorexia
- Chronic constipation
- Frequent and prolonged hospitalizations
- Dialytic/hormonal/metabolic factors

RECOMMENDED INTERVENTIONS

- Frequent dietary assessment
- Dietary supplements
- Social work support
- Pharmacy support

COMPLICATIONS/SPECIAL CONDITIONS: HYPOXEMIA

- Occurs within 15 minutes of starting dialysis
- Effects increased in the elderly with decreased cardiac/pulmonary reserve
- Less prominent with biocompatible membranes

Ismail, Oreopoulos AJKD 1993

COMPLICATIONS/ SPECIAL CONDITIONS: AMYLODOSIS

- Hemodialysis related amyloidosis (β_2 microglobulin)
- Increased in patients over 40 years old

COMPLICATIONS/SPECIAL CONDITIONS: BLEEDING

- GI bleeding, secondary to diverticulosis, angiodysplasia, gastritis
- Subdural hematoma

RECOMMENDATIONS

- Follow hemoglobin
- Use caution with anticoagulants
- Good dialysis management
  - Membranes
  - adequacy

COMPLICATIONS/SPECIAL CONDITIONS: AUTONOMIC NEUROPATHY

- Increased incidence in elderly dialysis patients
- Increased arrhythmias are associated with autonomic neuropathy
- No treatment

Jassal *et al,* Am J Kid Dis. 30: 1997: 219-223, Jassal *et al,* PDI 18; 1998; 46-51

COMPLICATIONS/SPECIAL CONDITIONS: FALLS

- Increased fractures (all dialysis patients)
- "Falls" frequent, but similar to non dialyzed elderly

Roberts *et* al, Intern Urol and Neph 35: 2003: 415-421Cook and Jassal, Int. Urology and Nephrology 37: 2005: 649-652

SPECIAL CONDITIONS: Ethical Issues: Nephrology Nurses Study (1996)

- 393 Nurses responded to questionnaire
- 80% Were troubled by decision to dialyze some elderly patients
- Felt 15% of patients in unit shouldn't be dialyzed
- QofL issues accounted for reasons in 75% of patients

Badzek *et al* Nephrology Nursing J 5: 2000: 462-470

Q OF L ISSUES

- Cognitive impairment
- Physical dependancy (amputated limbs)
- Pain and suffering
- Nursing home or chronic care placement
- Inadequate prior knowledge/understanding
- Happiness/support
- Poor prognosis
- Cost

ETHICAL ISSUES: QofL NEGATIVE

- More depressive symptoms/loneliness
- Advanced age independently associated with worse psychosocial and physical functioning scores on QofL instruments compared to younger dialysis patients

Kutner *et al* Arch Physmed Rehab 81: 2000

QUALITY OF LIFE

- Decreased physical function, health status and psychosocial affect (mood)
- More depression, less life satisfaction than non ESRD peers
- Decreased physical function with years on dialysis
- Restless sleep

QUALITY OF LIFE-POSITIVE

- Increased life satisfaction in elderly dialysis patients compared to young dialysis patients
- Even with decreased physical function

Kutner and Jassal, Seminars in Dialysis 15: 2002: 107-112

INTERVENTIONS

- Exercise programs
- Resistance training
- Rehabilitation
- Mixed success
- "Dismal"→ modest improvement
- Need to intervene early and consistently

Kutner *et al*, Am J Phys Med Rehabil,71: 1992: 97-101; Ifudu *et al*, JAMA, 271: 1994:

ETHICAL ISSUES

- Withdrawal of dialysis accounts for 9-40% of deaths in the elderly
- 17% in elderly versus 1.6% in patients < 45 years old
- 3rd most common cause of death in patients over 65 years old
- Incidence rises with age:
  - 1% < 44 years
  - 6% > 65 years
  - 8% > 75 years
- White patients > Black patients

Ismail,Oreopoulos AJKD, 1993

ETHICAL ISSUES

- Discordance between substitute decision makers, nephrology team and patient
- Patient often wanted to continue when team/family thought his/her quality of life was unbearable

Pruchno, Medical Decision Making March – April, 2006

RECOMMENDATIONS

- Trial of dialysis
- Treat depression
- Multidisciplinary team
- Respect patient's wishes
- Don't impose one's own value system upon the patient
- Advance care planning

Lowance, Seminars in Dialysis 15: 2002, Anderson, AJKD, 48: 2006: 122-127

CHOICE OF DIALYSIS TYPE

- Primary treatment choice is hemodialysis
  - >80% treated with hemodialysis
  - <10% treated with peritoneal dialysis
- 2 – 3% treated with renal transplant

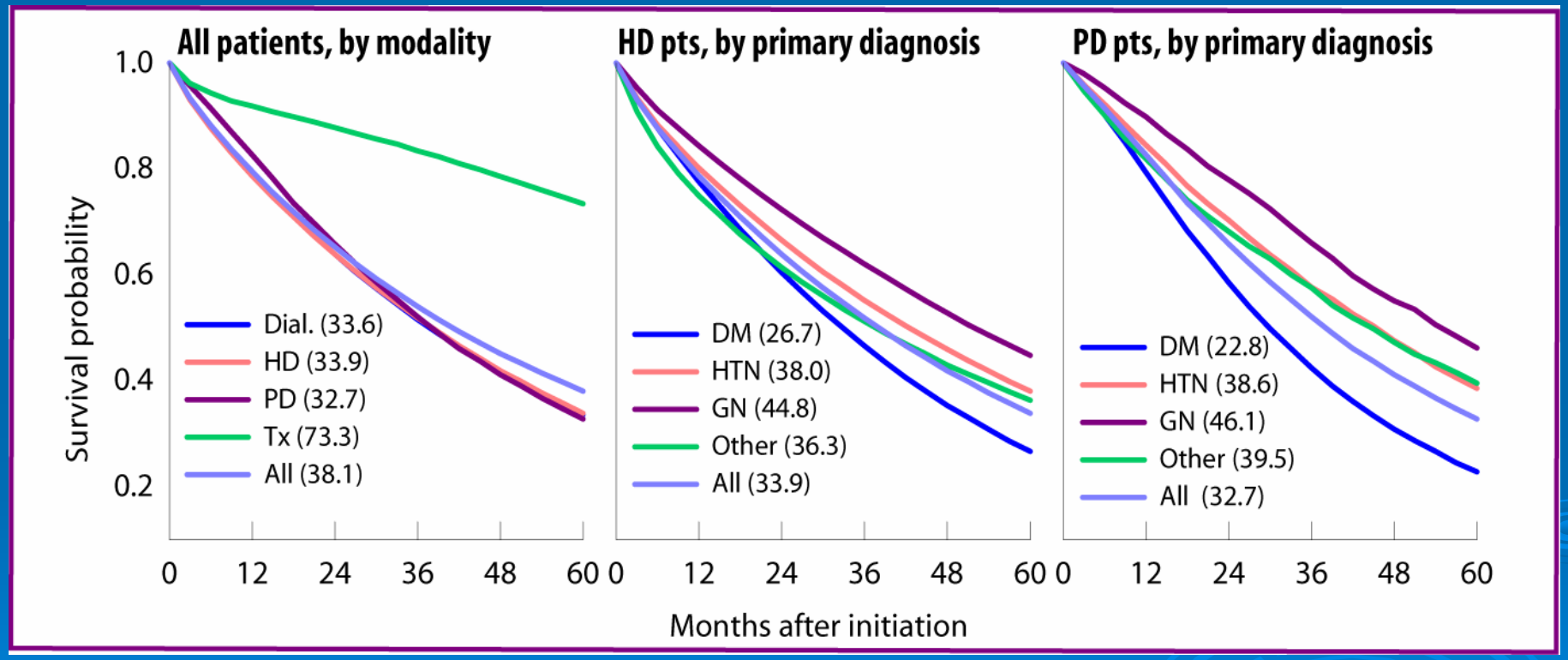
OUTCOMES HD VERSUS PD

- Earlier results showed increased mortality on PD in some groups
- Other data show equal survival

Collins *et al,* Seminars in Dialysis 16: 98-102, Lund *et al,* Advances in Peritoneal Dialysis: 68-72

Adjusted five-year survival, by modality and primary diagnosis: 1994-1998

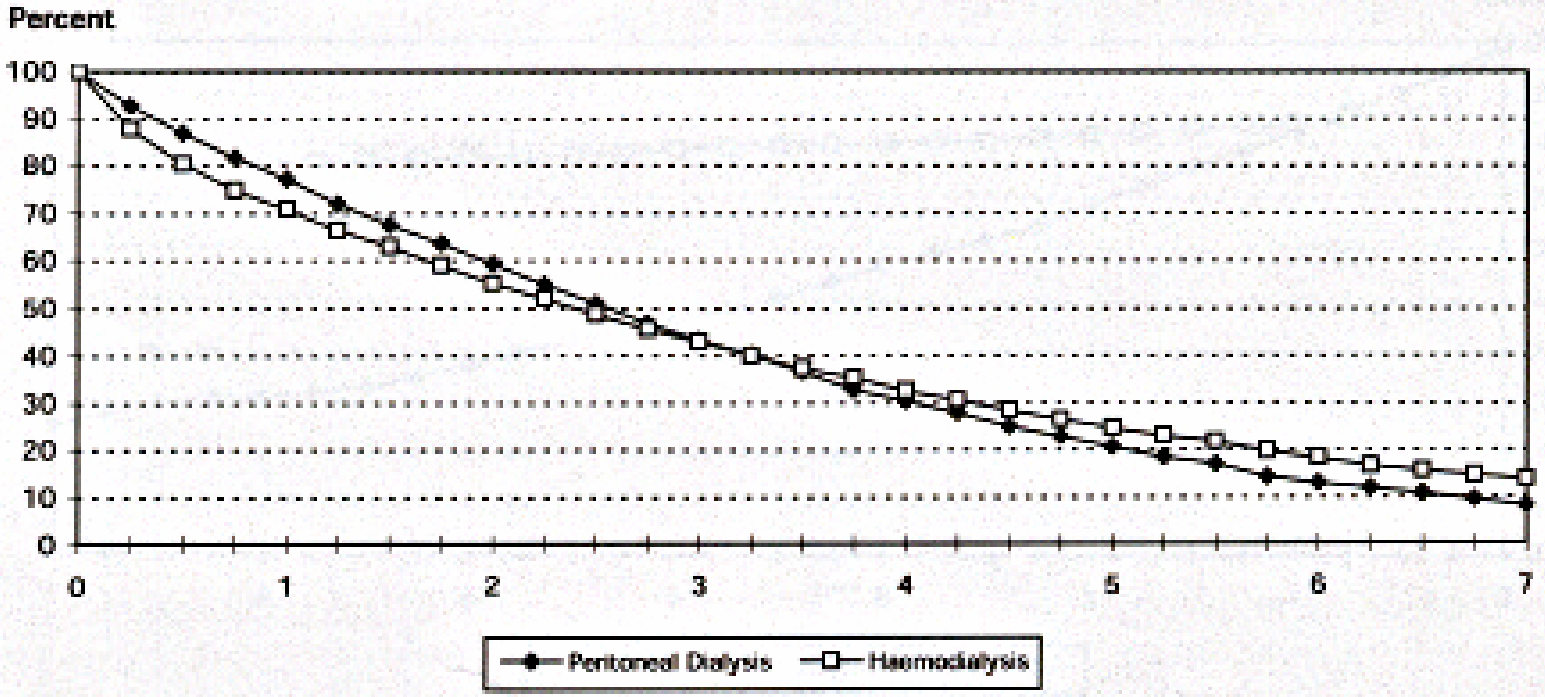
Figure 6.4 (continued)



Incident dialysis patients & patients receiving a first transplant in the calendar year. All probabilities are adjusted for age, gender, & race; overall probabilities are also adjusted for primary diagnosis. All ESRD patients, 1996, used as reference cohort. Modality determined on first ESRD service date; excludes patients transplanted or dying during the first 90 days (five-year survival probabilities noted in parentheses).

ESRD Survival by Type of Dialysis

Figure 107 Patient Survival (Age 65+) by Type of Dialysis, Non-Diabetic, Canada, 1981–1999



n at risk

	0	1	2	3	4	5	6	7
Peritoneal Dialysis	4,317	2,450	1,470	813	426	222	105	51
Haemodialysis	10,398	4,985	3,125	1,957	1,190	713	406	244

Source: CORR/CIHI 2001

HEMODIALYSIS

- Increased peripheral vascular disease
- AV fistula may have slow maturation, inadequate blood flow rates, high incidence of arm swelling and steal
- AV grafts – less desirable
  - No increased thrombosis
- Rarely cardiac failure secondary to excessive shunting
  - Temporary occlusion should decrease heart rate

HOME HEMODIALYSIS

- Underutilized

PERITONEAL DIALYSIS

- Underutilized
- Advantages
  - Less pronounced fluid shifts (less BP fluctuations)
  - Less rapid decline in residual renal function
  - Less anemia
  - Avoids vascular access problems
  - More effective removal of B_2microglobulin

CONTRAINDICTIONS FOR PD

- Abdominal Adhesions
- Recent aortic prosthesis
- Ostomies
- Hernias
- Need for support

Advantages of PD for Older Patients

- Less dietary restriction
- Flexibility in treatment schedules
- Fewer clinical visits

Disadvantages of PD for Older Patients

- Requires more self-care than Hemodialysis
- Self-care may be less possible in the elderly

Objective

- To compare the success of Peritoneal Dialysis (PD) utilization in patients aged over 80 years old (Octogenarians) (O) at TSH

Roscoe, Brissenden, First Asia PD Conference Dec 13-15, 2002

Method

- Database created logging:
  - Demographics
  - Comorbidities
  - Dialysis type
  - Living arrangement
  - Dialysis type switch
  - Housing
  - Family assistance

Results: Dialysis Demographics

- Total dialysis patients = 478
  - 186 Females: 292 Males (1:1.57)
  - 169 PD: 309 HD
  - PD 78 Females: 91Males (1:1.17)
  - PD Age Range (24-91 years)
  - HD age range (22-94 years)

Results: Dialysis Demographics

- Mean ages of dialysis patients
  - Females (PD) 61.7 years: Males 61.8 years
  - Females (HD-In Centre) 59.2yrs: Males 65.8yrs
  - Octogenarians Female 8 PD (31%), 18 HD
  - Octogenarians Male 13 PD (41%), 19 HD
  - Octogenarians All Types Dialysis Female 26
  - Octogenarians All Types Dialysis Male 32

Comorbidities/Causes ESRD

- PD Octogenarians: Mean = 2.6
- HD Octogenarians: Mean = 2.7
- Major Causes of ESRD
  - Diabetes
  - Hypertension

PD Assistance: Octogenarians

- Family 15/21
- Nurse 2/21
- Unassisted 4/21

Octogenarians vs. All Patients

- 15/21 Octogenarians on PD gave information on housing and whether they switched dialysis formats
- 3/14 HD O and 0/21 PD O lived in Nursing Homes
- No Octogenarian had to switch from PD for lack of suitable housing or assistance

Time on Dialysis Treatment

- All PD: Mean = 21.9 months
- Octogenarian PDs: Mean = 20.8 months
- All HD: Mean = 21.4 months

Octogenarians vs. All Patients

- One octogenarian female switched from PD to HD for medical reasons (1:21)
- This lady was assisted in her PD by family members
- 14/169 total PD patients switched (1:12)
  - 4 for medical reasons
  - 11 for other reasons

Chronic Peritoneal Dialysis in Octogenarians

- Peritonitis rate 1:28.6 patient months
  - Staph epi 37.5%, gram negative 25%
- Exit site infections 1:76.1 patient months

Dimkovic, Roscoe, Brissenden et al, Neph Dial and Transpl 16: 2034 – 2040, 2001

PD IN THE ELDERLY

- Elderly patients may require a long term care facility or a home helper
- Various models of successful implementation have been published

Tong and Nissenson, Seminars in Dialysis, 12: 2002, 103-106

RENAL TRANSPLANTATION IN THE ELDERLY

- Controversial
- Allocating scarce resources to the elderly
- Increased risk of surgery

Bia, Geriatr Nephrol Urol. 9: 1999: 109-13

OUTCOME: TRANSPLANTATION IN THE ELDERLY

- Excellent survival in the over 60 age group
- Four year survival 62% in transplanted elderly versus 13% on dialysis
- Discrimination on basis of age is not supported by medical research and is not justified
- Old for old transplant (over 60) shows 89.5% patient survival and 86.9% graft survival at one year

Macrae et al (Friedman) International Urol and Neph 37:641-648

OUTCOME: TRANSPLANTATION IN THE ELDERLY

- Five year follow-up showed equal patient and graft survival at 5 years
- Lower incidence of rejection due to decreased immune response in the elderly

OUTCOMES

- Decision analysis (Jassal):
  - Transplantation in the elderly is economically attractive
- Quality of Life (Rebollo)
  - Q of L in elderly transplant patients is better than that of seniors in the normal population

OUTCOME (Friedman)

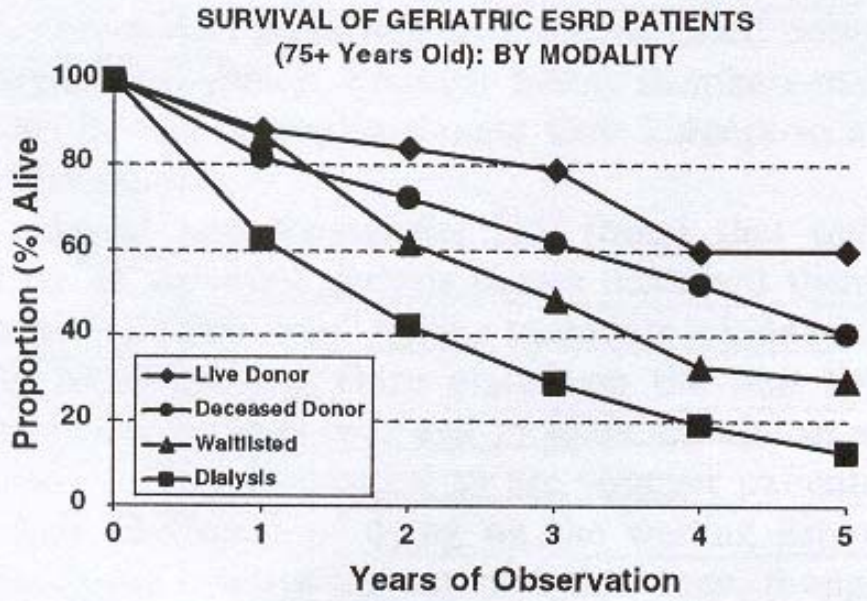


Figure 1. Survival of geriatric ESRD patients age 75 and older is compared according to treatment modality. The effect of selection bias is evident in the better survival of waitlisted patients who continued on dialysis when compared to dialysis patients who were not waitlisted. The best survival is noted in kidney transplant recipients given a live donor kidney. Data from the USRDS.

OUTCOME (Friedman)

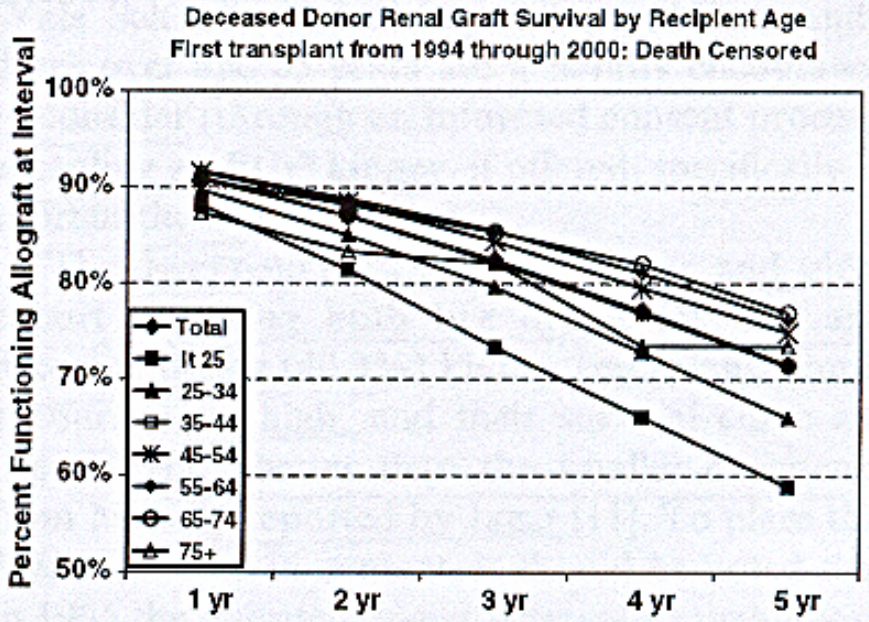


Figure 2. Deceased donor graft survival rates are shown by age group. Data are censored for patient deaths. The highest graft survival rates are found in patients aged 65–74. Patients over the age of 75 had better graft survival rates than patients under 55. Data from the USRDS.

RECOMMENDATIONS

- Peritoneal Dialysis, Hemodialysis and Transplant are all feasible in the elderly
- Complex ethics of organ donation
- But on medical grounds patients over 75 can be offered transplantation

RECOMMENDATIONS AND CONCLUSIONS

- Elderly patients do have different diagnoses (causes) of renal failure
- Do have different risks and complications
- Do present different ethical problems
- Do have reasonable survival and quality of life

RECOMMENDATIONS AND CONCLUSIONS

- The elderly need a full multidisciplinary team approach to management of renal failure
- Need availability of all types of renal replacement therapy
- Need continuum of care including long term care



DIALYZING THE ELDERLY

THE END:
The Young Grandmother