

# Integratives Behandlungs- konzept



**Fakten für die prädialytische Aufklärung**

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**JASN**<sup>TM</sup>

Journal of the American  
Society of Nephrology

# **An Evaluation of an Integrative Care Approach for End-Stage Renal Disease Patients**

**WIM VAN BIESEN, RAYMOND C.  
VANHOLDER, NIC VEYS, ANNEMIEKE  
DHONDT and NORBERT H. LAMEIRE**

J Am Soc Nephrol 11:116-125, 2000

## Table 3. Reasons for transfer

From HD to PD (n = 35 from 223 )	
cardiovascular problems	40%
access problems	25%
personal choice	23%
blood pressure problems	12%
From PD to HD (n = 32 from 194)	
peritonitis/exit-site infection	50%
adequacy and/or ultrafiltration problems	25%
social problems	14%
extraperitoneal leakage of dialysis fluid	11%

Figure 3. Log-rank analysis of patient intention-to-treat survival. Solid line, patients started on HD (without transfer); dotted line, patients started on PD and transferred afterward to HD. P = 0.01. N = event numbers

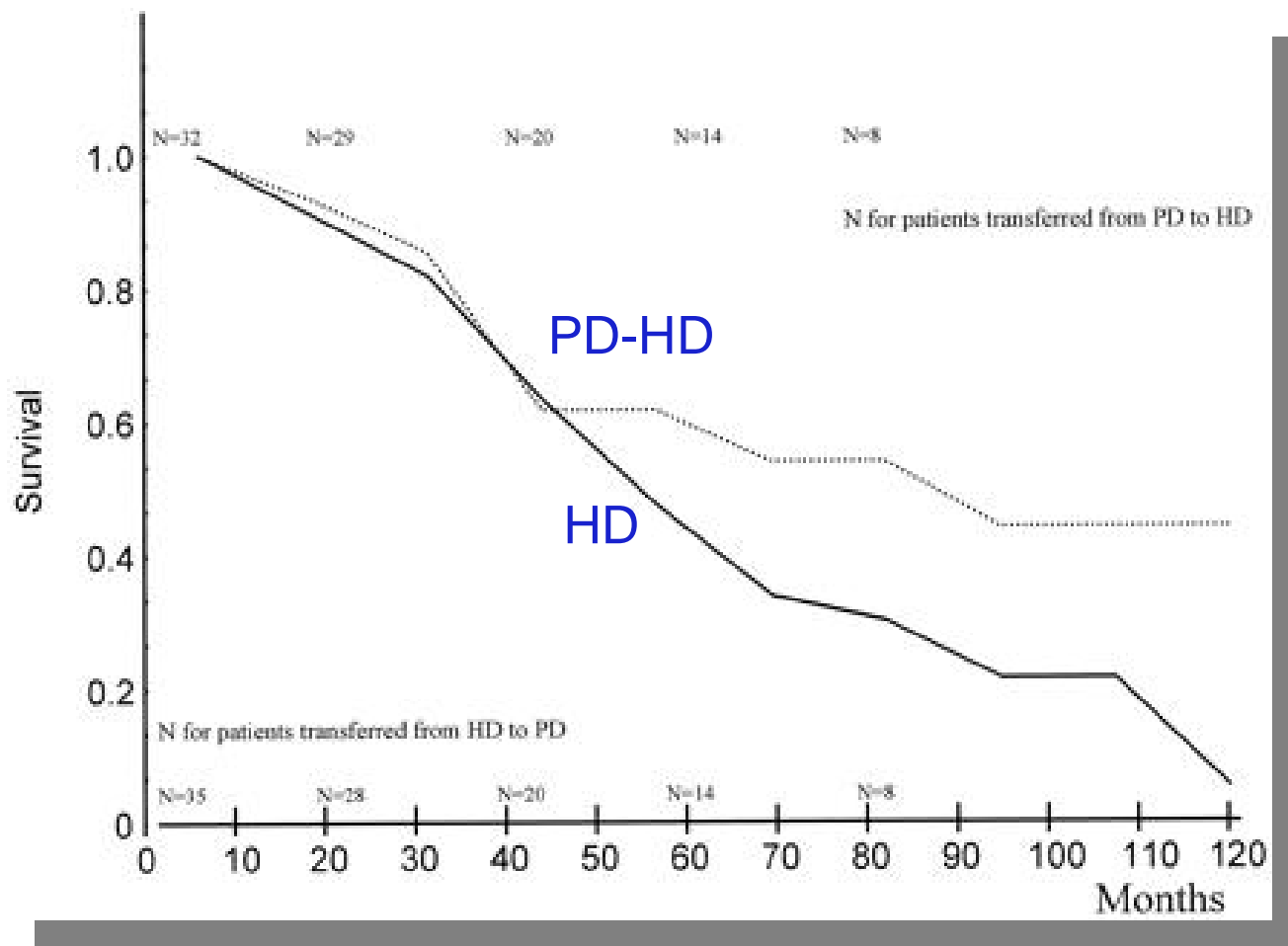
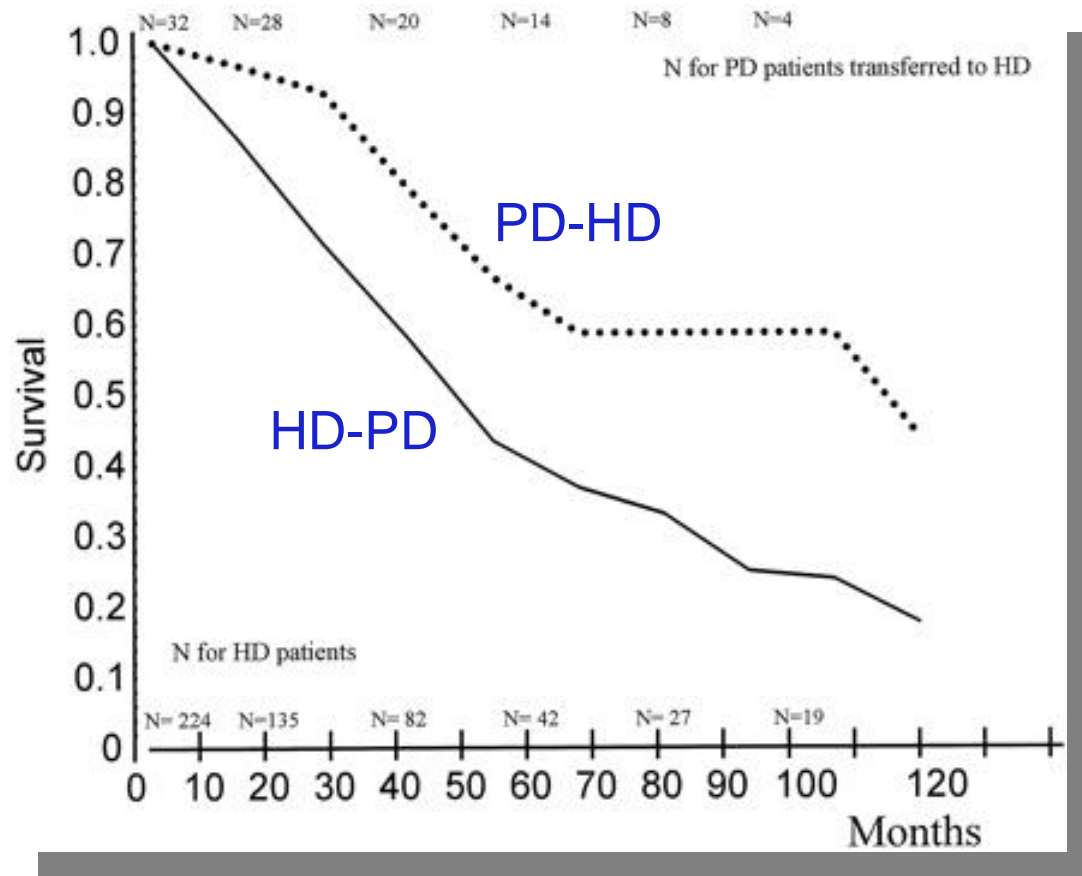


Figure 4. Log-rank analysis of patient intention-to-treat survival. Solid line, patients started on HD and transferred to PD; dotted line, patients started on PD and transferred to HD.  $P < 0.01$ . N = event numbers.



# Vorteile der Peritonealdialyse als erste Therapiemodalität:

1. Überleben?

2. Morbidität?

3. Erhalt der renalen Restfunktion?

4. Lebensqualität?

# Patientenauswahl

## Patientenüberleben in Kanada (1990-1994)

### Kanadisches Dialyseregister

- 10633 Patienten mit term. Niereninsuffizienz
- Dialysebeginn zw. 1990 u. 1994
- Mortalitätsrisiko PD vs. HD
- HD: n = 7792
- PD: n = 2841
- Daten korrigiert für: Alter, Grunderkrankung, Zentrumgröße und Begleiterkrankungen
- Relatives Risiko Mortalität PD: 0.73

**Fenton D et al., Am J Kid Dis 30 (3) ,1997**

# Mortality Rates on Dialysis by Follow-up Interval

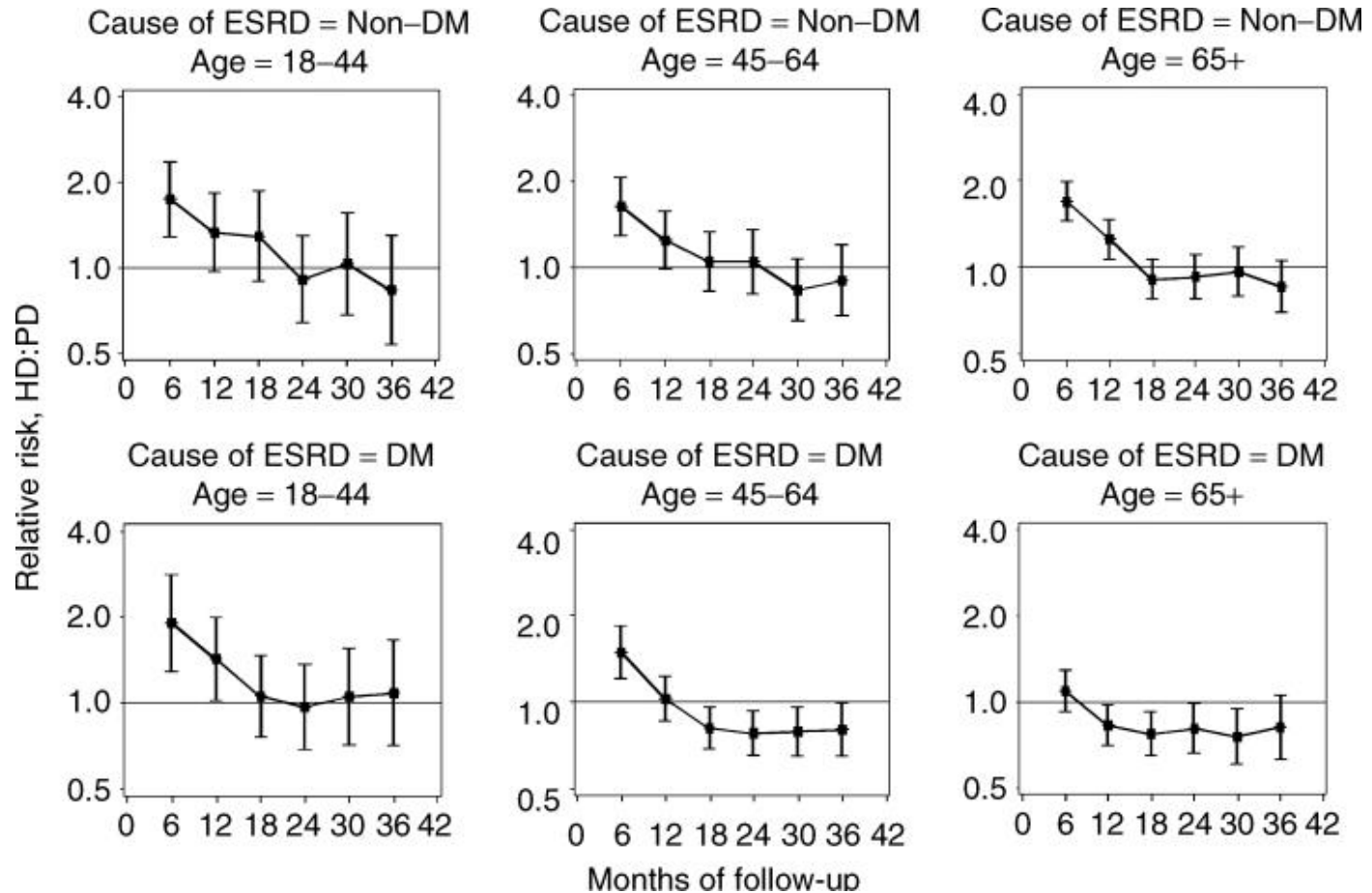
Rate per 1,000 patient-years at risk



SOURCE: Fenton SA, et al, *Am J Kidney Dis*, 1997; 30:334-342

# The differential impact of risk factors on mortality in hemodialysis and peritoneal dialysis

**Relative risk of death, RR(HD:PD), among patients with no reported comorbidity at baseline.** RRs are adjusted for age, gender, race, and cause of ESRD, and baseline values of GFR, albumin, hemoglobin, and BMI.



Zur Anzeige wird der QuickTime™  
Dekompressor „TIFF (LZW)“  
benötigt.

(HD, n = 742;  
PD, n = 480).

Zur Anzeige wird der QuickTime™  
Dekompressor „TIFF (Unkomprimiert)“  
benötigt.

# Comparing the risk for death with PD and HD (CHOICE).

Table 1. Baseline Characteristics of Patients, by Initial Type of Dialysis

Characteristic	Patients Undergoing Peritoneal Dialysis*	Patients Undergoing Hemodialysis†	P Value‡
<b>Demographic</b>			
Mean age, y	53.7, SD 14.8	59.3, SD 14.8	<0.001
Female, %	44.5	46.3	>0.2
White, %	77.4	63.1	<0.001
High school graduate, %	82.6	66.3	<0.001
Married, %	67.5	52.8	<0.001
Employed, %	27.0	8.6	<0.001
Living >30 miles from clinic, %	28.9	8.4	<0.001
<b>Clinical</b>			
Ever a smoker, %	61.3	60.4	>0.2
Index of Coexistent Disease score, %			<0.001
≤1 (none to mild)	50.7	30.3	
2 (moderate)	25.2	38.0	
3 (severe)	24.1	31.6	
Diabetes mellitus, %	55.0	51.2	>0.2
Primary cause of renal failure, %			<0.001
Diabetes mellitus	46.9	46.4	
Hypertension	9.6	20.2	
Glomerulonephritis	18.8	15.3	
Other	24.7	18.1	
Cardiovascular disease, %	49.3	59.9	0.003
Mean body mass index, kg/m <sup>2</sup>	26.5, SD 5.7	27.3, SD 7.0	0.101
Late referral, %§	19.8	32.9	<0.001
Residual urine output at baseline, %	88.0	81.1	0.015
Mean glomerular filtration rate at start of dialysis, mL/min/1.73 m <sup>2</sup>	7.1, SD 2.6	7.3, SD 2.4	>0.2
<b>Laboratory</b>			
Mean serum albumin level, g/L	36.3, SD 4.9	35.0, SD 4.7	<0.001
Mean hemoglobin level, g/L	113, SD 14	106, SD 12	<0.001
Mean calcium-phosphate product, mmol <sup>2</sup> /L <sup>2</sup> (mg <sup>2</sup> /dL <sup>2</sup> )	3.78, SD 0.99 (46.8, SD 12.3)	4.01, SD 1.02 (49.6, SD 12.6)	0.002
Mean total cholesterol level, mmol/L (mg/dL)	5.37, SD 1.38 (207.3, SD 53.3)	4.76, SD 1.16 (183.8, SD 44.9)	<0.001
Median log C-reactive protein level (interquartile range), mg/L	3.18 (1.34–6.24)	3.92 (1.76–10.26)	0.005
Mean creatinine concentration, μmol/L (mg/dL)	648, SD 238 (7.33, SD 2.69)	640, SD 220 (7.24, SD 2.49)	>0.2

1041 Pat.

274 PD

767 HD

Mortality:

PD 21%

HD 24%

2.4 y

\* For peritoneal dialysis, n = 274 for all characteristics except education (n = 236), marital status (n = 249), distance from center (n = 225), primary cause of renal failure (n = 271), body mass index (n = 257), late referral (n = 207), residual urine output at baseline (n = 234), albumin level (n = 260), hemoglobin level (n = 258), calcium-phosphate product (n = 259), cholesterol level (n = 229), C-reactive protein level (n = 168), and creatinine concentration (n = 264).

† For hemodialysis, n = 767 for all characteristics except education (n = 736), marital status (n = 758), employment (n = 766), distance from center (n = 729), Index of Coexistent Disease score (n = 765), diabetes (n = 765), primary cause of renal failure (n = 763), body mass index (n = 716), late referral (n = 621), residual urine output at baseline (n = 725), albumin level (n = 748), hemoglobin level (n = 744), calcium-phosphate product (n = 746), cholesterol level (n = 598), C-reactive protein level (n = 699), and creatinine concentration (n = 747).

‡ By analysis of variance (continuous variables) or chi-square test (categorical variables) for peritoneal dialysis at baseline versus hemodialysis at baseline.

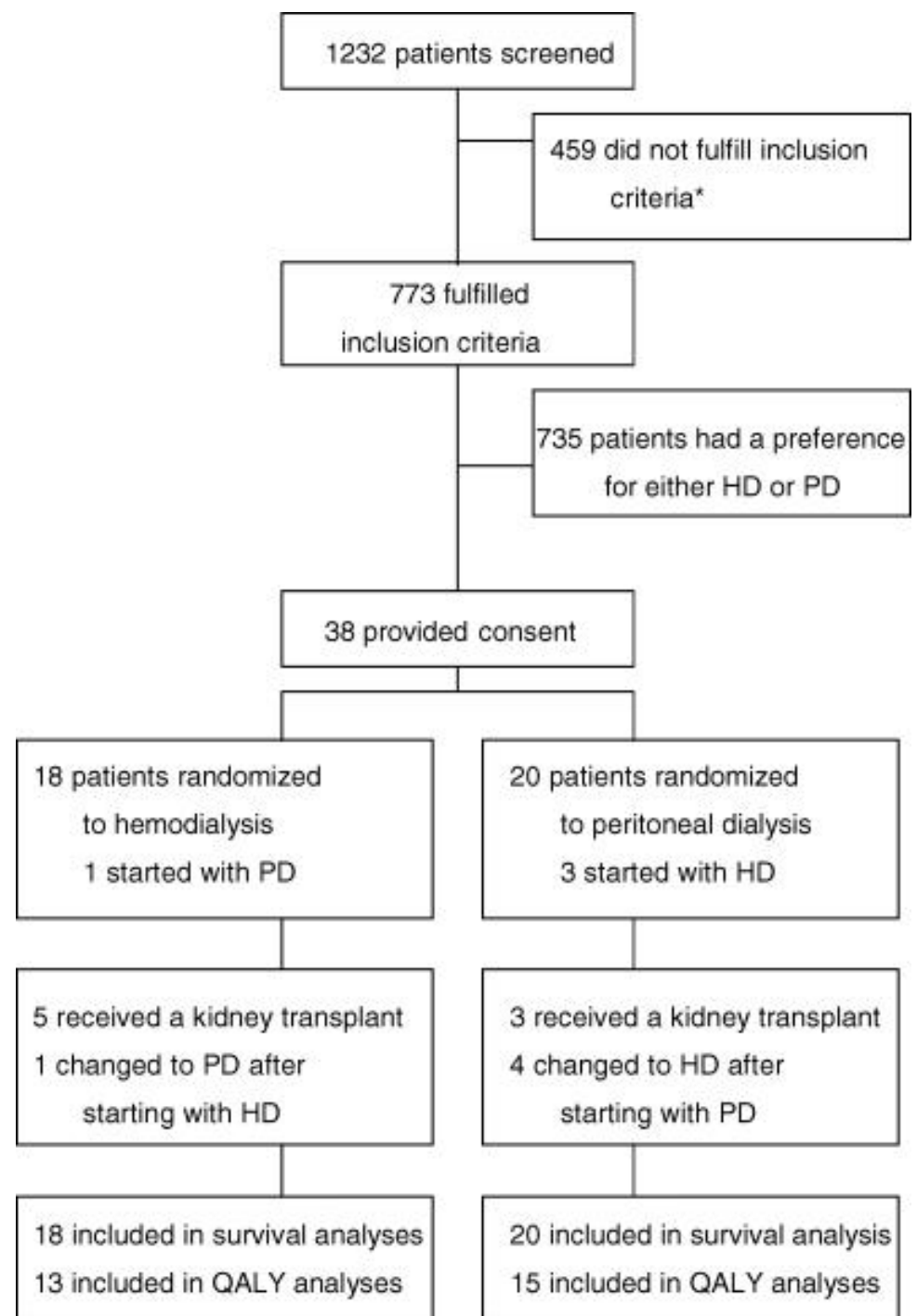
§ Less than 4 months from first evaluation by a nephrologist to initiation of dialysis.

|| Estimated by using the Modification of Diet in Renal Disease equation.

**Table 3. Relative Hazard of Death Associated with Peritoneal Dialysis versus Hemodialysis, from Intention-to-Treat Cox Proportional Hazards Analysis\***

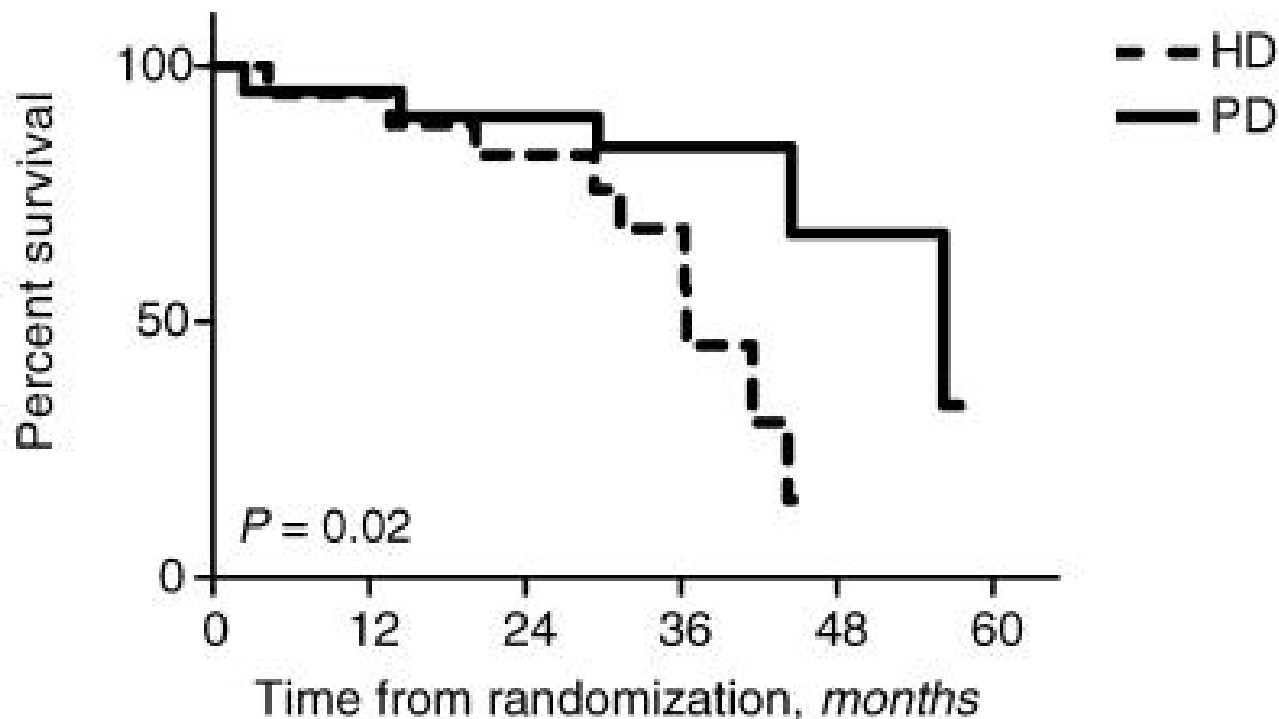
Patient Group†	Multivariate Model		Propensity Score Model	
	Total Cohort in All Clinics	Subcohort in Clinics Offering Both Techniques	Total Cohort in All Clinics	Subcohort in Clinics Offering Both Techniques
<b>PD „schlechter“ !??</b>				
<b>PD/HD &gt; 1 = PD schlechter</b>				
<b>All patients (n = 1041/609)</b>				
Unadjusted	1.10 (0.80–1.51)	1.45 (0.98–2.15)	1.10 (0.80–1.51)	1.45 (0.98–2.15)
Adjusted				
Demographic characteristics‡	1.25 (0.91–1.73)	1.46 (0.94–2.24)	1.33 (0.96–1.84)	1.64 (1.08–2.48)
Plus clinical/treatment factors§	1.35 (0.97–1.87)	1.56 (1.00–2.44)	1.57 (1.12–2.18)	1.91 (1.25–2.91)
Plus laboratory values	1.61 (1.13–2.30)	2.02 (1.23–3.32)	1.74 (1.23–2.46)	2.14 (1.38–3.32)
<b>By year of follow-up</b>				
<b>First year (n = 1041/609)</b>				
Unadjusted	0.75 (0.37–1.54)	0.77 (0.33–1.81)	0.75 (0.37–1.54)	0.77 (0.33–1.81)
Adjusted				
Demographic characteristics‡	0.92 (0.45–1.89)	0.77 (0.31–1.88)	0.97 (0.47–2.00)	0.94 (0.39–2.26)
Plus clinical/treatment factors§	1.06 (0.51–2.19)	0.84 (0.33–2.14)	1.33 (0.64–2.77)	1.29 (0.52–3.22)
Plus laboratory values	1.39 (0.64–3.06)	1.18 (0.41–3.43)	1.47 (0.69–3.15)	1.55 (0.60–3.96)
<b>Second year (n = 795/478)</b>				
Unadjusted	1.06 (0.59–1.90)	1.25 (0.59–2.64)	1.06 (0.59–1.90)	1.25 (0.59–2.64)
Adjusted for				
Demographic characteristics‡	0.77 (0.31–1.88)	0.77 (0.31–1.88)	1.23 (0.67–2.27)	1.44 (0.66–3.16)
Plus clinical/treatment factors§	0.84 (0.33–2.14)	0.84 (0.33–2.14)	1.47 (0.80–2.72)	1.87 (0.85–4.14)
Plus laboratory values	2.34 (1.19–4.59)	2.52 (0.90–7.04)	2.05 (1.07–3.92)	2.96 (1.25–6.97)
<b>By patient subgroup</b>				
Age < 65 years (n = 664/408)¶	1.67 (1.01–2.75)	1.69 (0.89–3.21)	1.88 (1.16–3.06)	1.74 (1.00–3.05)
Age ≥ 65 years (n = 377/201)¶	1.66 (0.93–2.97)	2.32 (0.84–6.44)	1.67 (0.96–2.90)	2.24 (0.98–5.13)
<i>P</i> <sub>interaction</sub>	>0.2	>0.2	>0.2	>0.2
No diabetes mellitus (n = 480/264)¶	2.78 (1.36–5.68)	3.11 (1.07–9.06)	2.15 (1.09–4.25)	2.84 (1.17–6.91)
Diabetes mellitus (n = 561/345)¶	1.23 (0.79–1.94)	1.28 (0.65–2.50)	1.41 (0.91–2.19)	1.72 (0.97–3.05)
<i>P</i> <sub>interaction</sub>	>0.2	0.096	>0.2	>0.2
No history of cardiovascular disease (n = 447/268)¶	0.83 (0.38–1.81)	1.60 (0.54–4.74)	1.11 (0.54–2.26)	1.44 (0.58–3.60)
History of cardiovascular disease (n = 594/341)¶	2.10 (1.36–3.25)	2.19 (1.17–4.07)	1.74 (1.15–2.65)	1.99 (1.15–3.45)
<i>P</i> <sub>interaction</sub>	0.157	0.086	>0.2	0.033
No residual urine output at baseline (n = 181/107)¶	3.78 (1.33–10.7)**	2.17 (0.55–8.55)**	2.91 (1.04–8.12)	2.38 (0.37–15.1)
Residual urine output at baseline (n = 860/502)	1.15 (0.80–1.64)**	1.59 (0.98–2.59)**	1.69 (1.16–2.48)	2.60 (1.58–4.27)
<i>P</i> <sub>interaction</sub>	>0.2	>0.2	>0.2	>0.2

# Einschluss:



KI 2003;64:2222

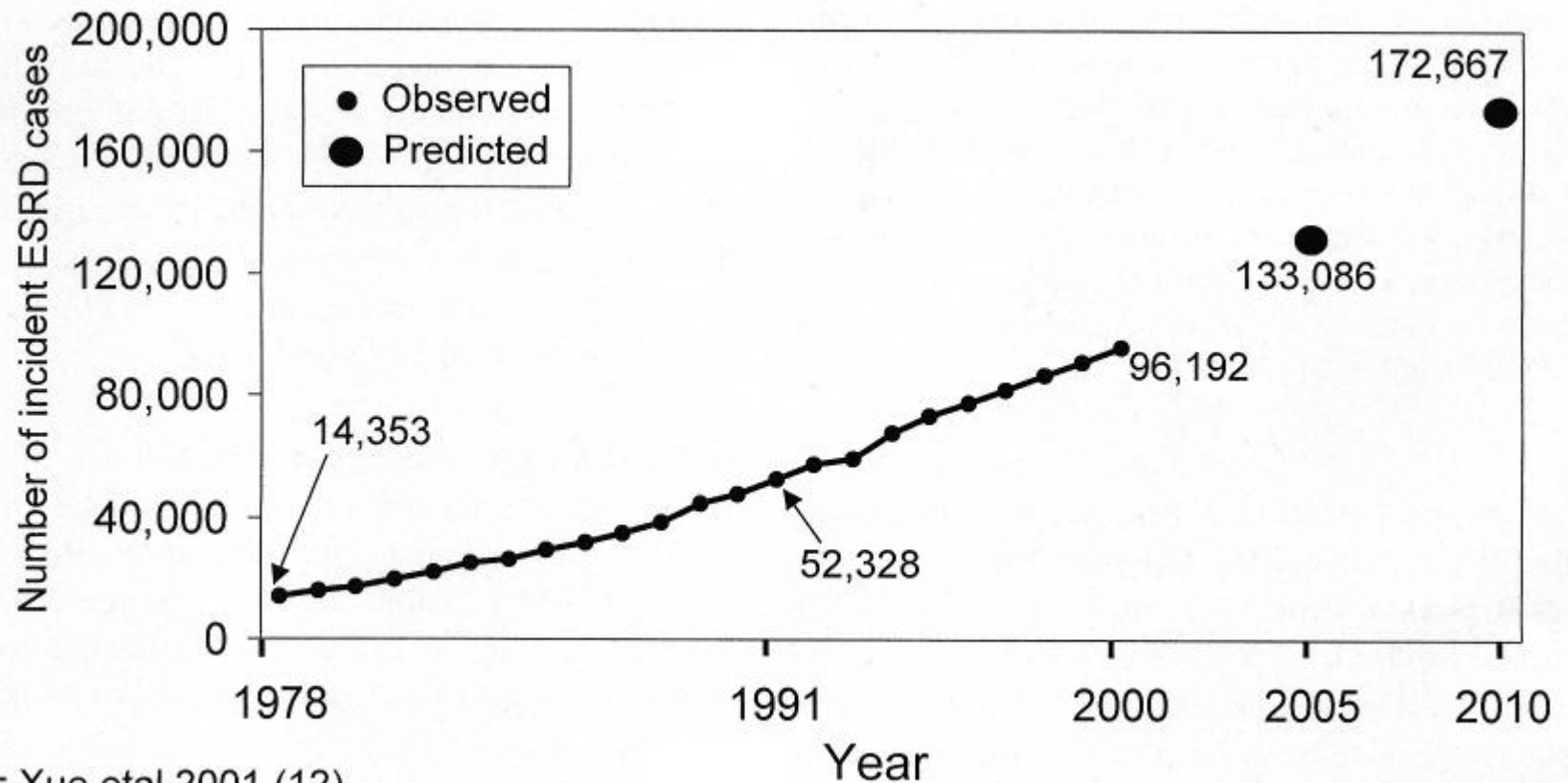
# Effect of starting with hemodialysis compared with peritoneal dialysis in patients new on dialysis treatment: a randomized controlled trial.



Number at risk

HD	18	16	12	6	0	—
PD	20	19	18	12	2	0

# Inzidenz der terminalen Niereninsuffizienz



† Xue et al 2001 (12)

‡ Including all age groups

JASN 2003,14:1568

# Ältere Patienten ?

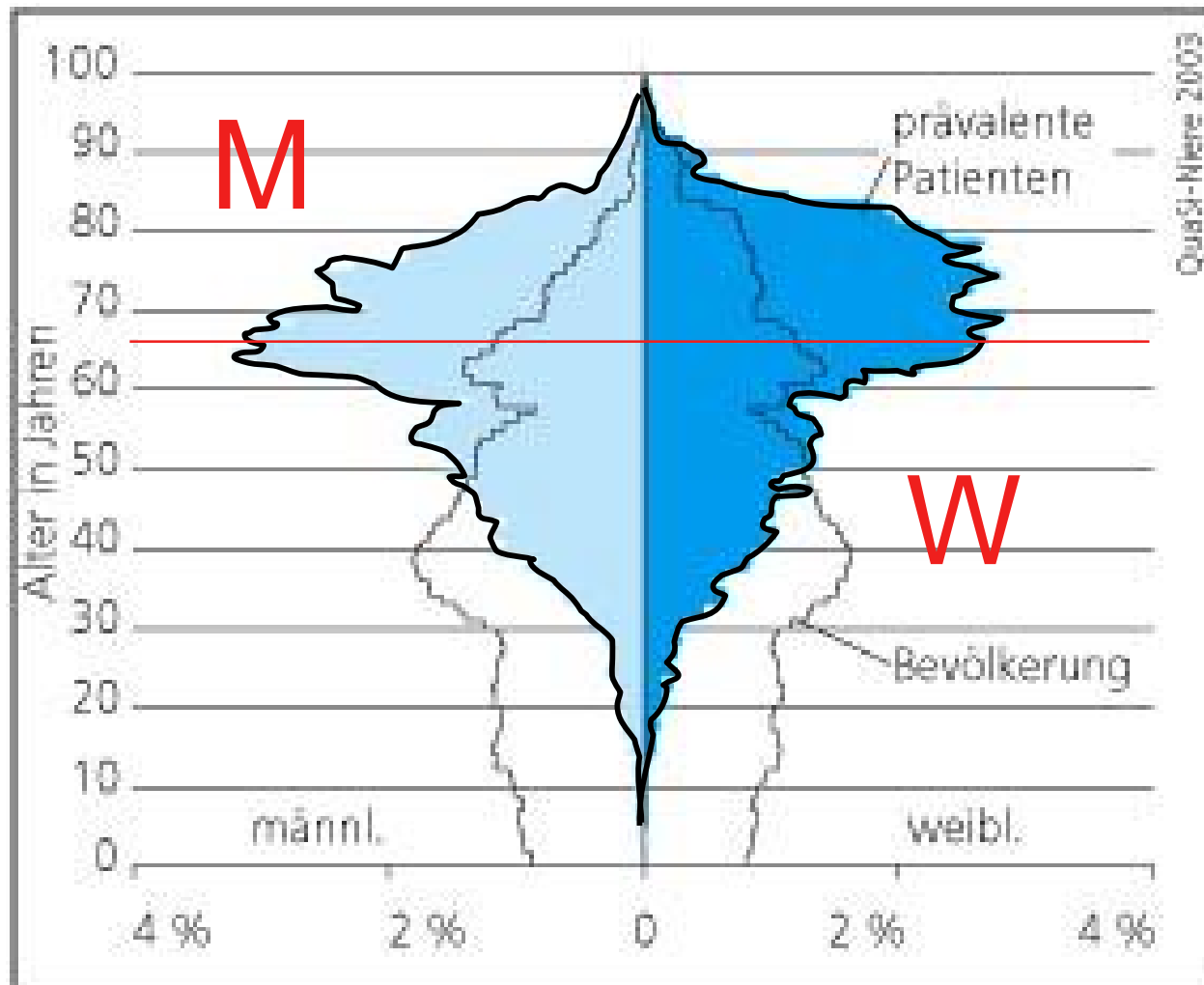
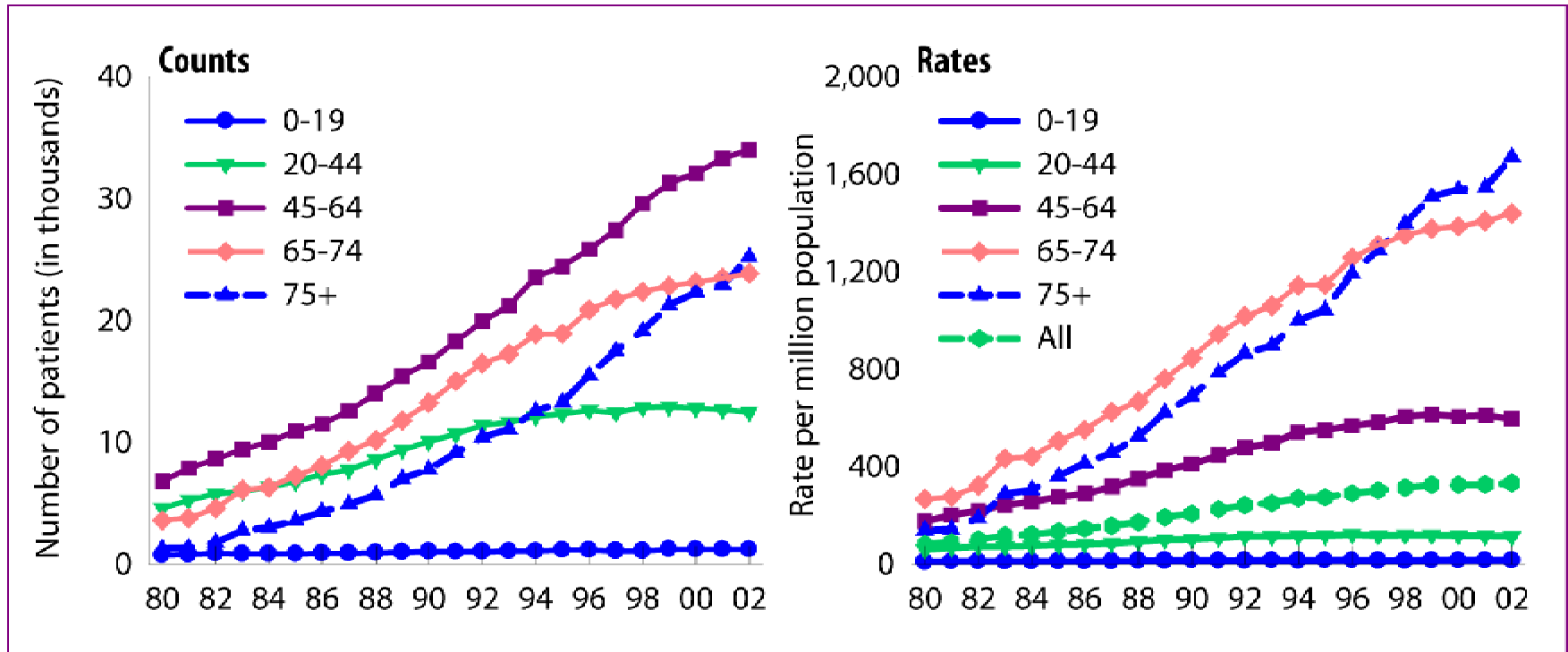


Abbildung 30 Alterspyramide der am 31.12.2003 lebenden Patienten in Nierenersatztherapie (Prävalenz) und der Gesamtbevölkerung



# Incident counts & adjusted rates, by age



USRDS 2004

Incident ESRD patients. Rates adjusted for gender & race.

# A multicenter, selection-adjusted comparison of patient and technique survivals on CAPD and hemodialysis

## Beobachtungszeitraum

1981-1987

## Studiengröße

PD 480 Patienten

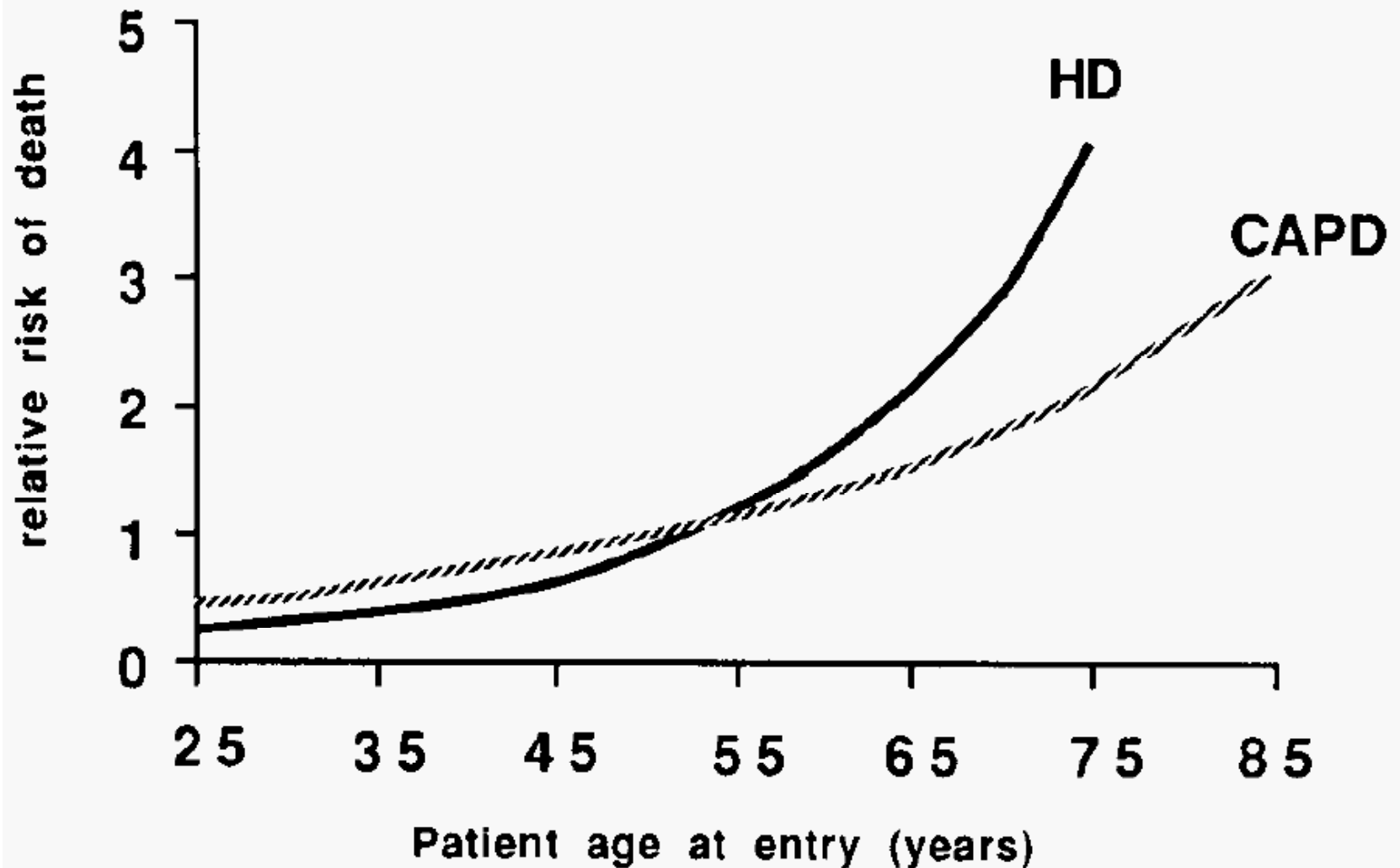
HD 373 Patienten

## Technik

PD 80% der Patienten 4 x 2 l/die

HD 3x4h/Woche

# A multicenter, selection-adjusted comparison of patient and technique survivals on CAPD and hemodialysis



# NECOSAD 2004

(AJKD 2004;43:891-899) 1347 Patienten: 36% KI (n = 483)

Medical contraindications to HD (n = 46)    Medical contraindications to PD (n = 225)\*■

Poor cardiac condition (n = 24)

Previous major abdominal surgery (n = 85)

Acute start (n = 3)

Cystic kidneys (n = 15)

Other (n = 19)

Poor lung function (n = 13)

Chronic inflammatory bowel disease (n = 10)

Poor cardiac condition (n = 10)

Obesity (n = 5)

Other (n = 67)

Social contraindications to HD (n = 4)

Social contraindications to PD (n = 150)\*■

Other (n = 4)

Incapable of performing PD exchanges themselves (n = 116)

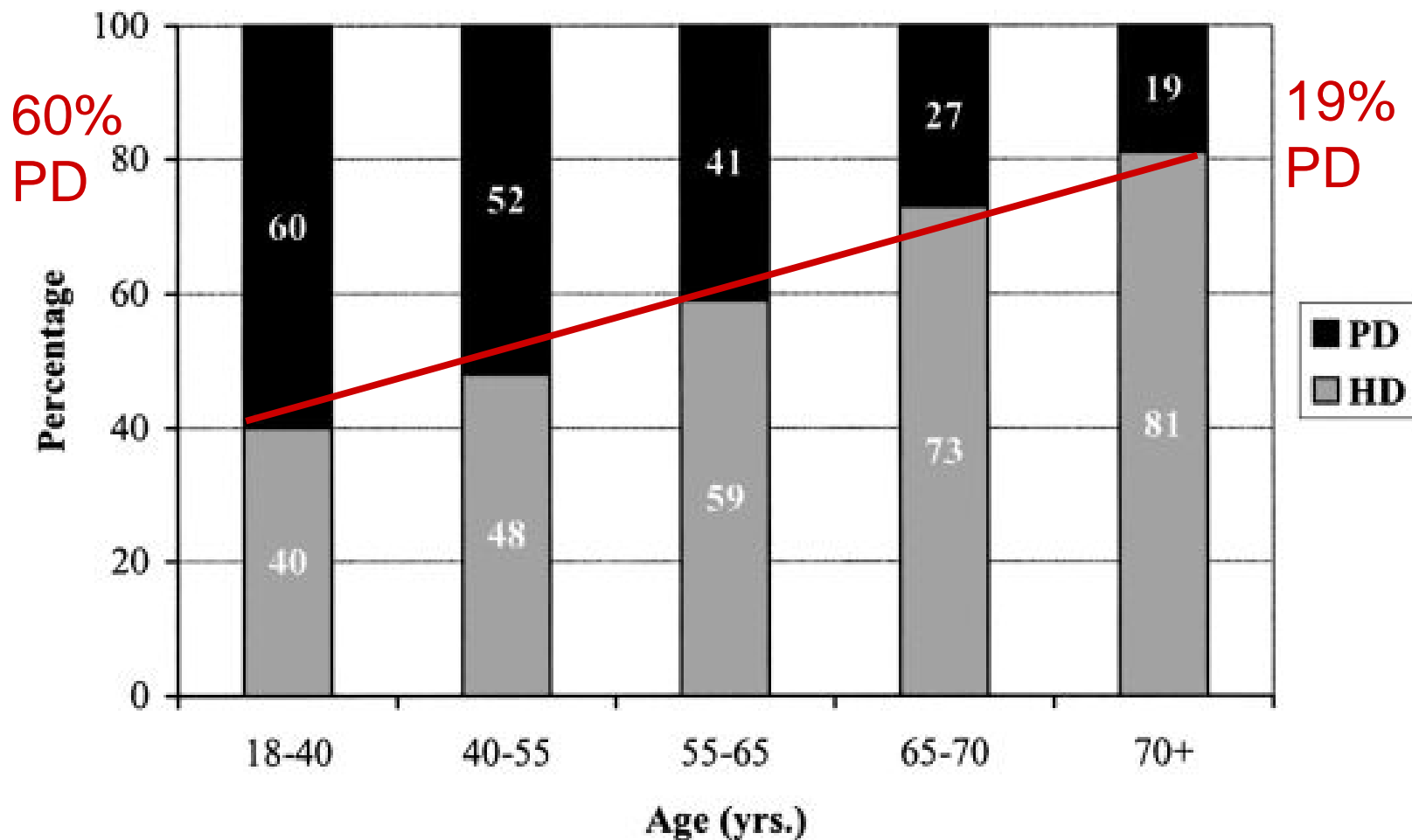
Other (n = 34)

NOTE. n = 417.

\*For 8 patients, both a medical and a social contraindication to PD was supplied.

# NECOSAD 2004

(AJKD 2004;43:891-899)



60%  
PD

19%  
PD



Number of patients: 179      322      277      179      390



**SURVIVAL OF ELDERLY PATIENTS ON PERITONEAL DIALYSIS:  
RETROSPECTIVE  
STUDY OF 292 PATIENTS, FROM 1982 TO 1999**

## Zentrumspolitik

- PD ist first-line Therapie > 75-jährigen
- Mittleres Alter 82 (60% > 85)
- Einzige Kontraindikationen:
  - Demenz
  - Metastasierende Tumoren
- 85% Heim-PD, 15% „hospital based NIPD“
- 95% der heim-PD Patienten benötigen Hilfe beim Wechsel



# SURVIVAL OF ELDERLY PATIENTS ON PERITONEAL DIALYSIS: RETROSPECTIVE STUDY OF 292 PATIENTS, FROM 1982 TO 1999

**TABLE 4**  
Cause-Specific Peritoneal Dialysis (PD) Mortality by Calendar Period in  
Patients Surviving Longer Than 90 Days on PD

	1982–1989 <i>n</i> (%)	1989–1995 <i>n</i> (%)	1995–1999 <i>n</i> (%)	1982–1999 <i>n</i> (%)
Patients starting PD	88 (30.1)	143 (49.0)	61 (20.9)	292
Survival on PD < 90 days	6 (6.8)	21 (14.7)	12 (19.7)	39 (13.4)
Survival on PD > 90 days	82 (93.2)	122 (85.3)	49 (80.3)	253 (86.6)
Alive on PD at end of study or censored	11 (12.5)	23 (16.1)	27 (44.3)	61 (20.9)
Cause of death				
Vascular <sup>a</sup>	22 (31.0)	40 (40.4)	9 (41.0)	71 (37.0)
Waning syndrome	8 (11.3)	27 (27.3)	7 (31.8)	42 (21.9)
Peritonitis	4 (5.6)	4 (4.0)	2 (9.1)	10 (5.2)
Cancer	3 (4.2)	—	3 (13.6)	6 (3.1)
Digestive	4 (5.6)	1 (1.0)	—	5 (2.6)
Infection (excluding peritonitis)	2 (2.8)	6 (6.1)	1 (4.6)	9 (4.7)
Unknown	18 (39.5)	21 (21.2)	—	49 (25.5)

<sup>a</sup> Cardiovascular and cerebrovascular death are identified as "vascular."

Peritonitis rate

1:19

1:26

1:56

PDI 2002;22:73-81



## Eingeschränkte Schulbarkeit und / oder Hilflosigkeit

- Nur ca. 20% der über 75-jährigen können sich mit CAPD selbst versorgen
- PD-Wechsel durch ambulante Pflegedienste (Familie)



# Vorteile der Peritonealdialyse als erste Therapiemodalität:

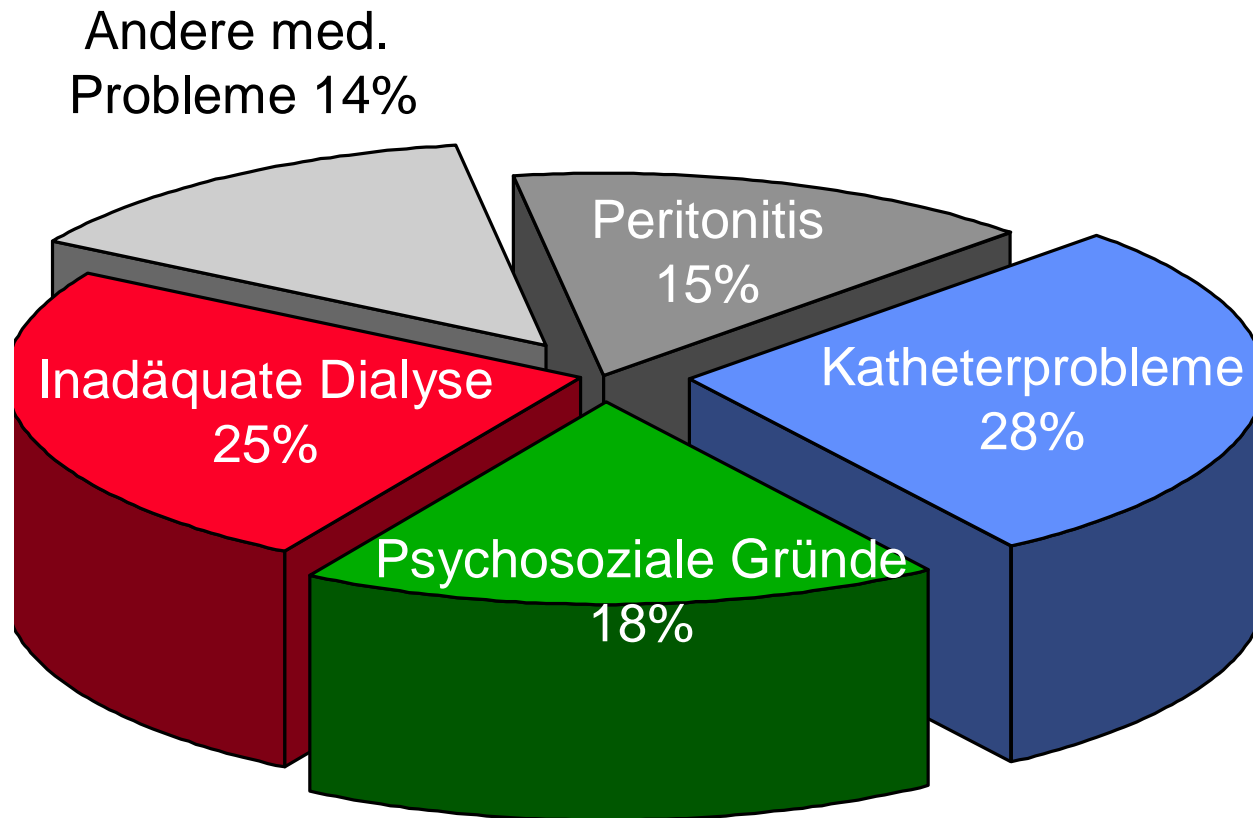
1. Überleben?

2. Morbidität?

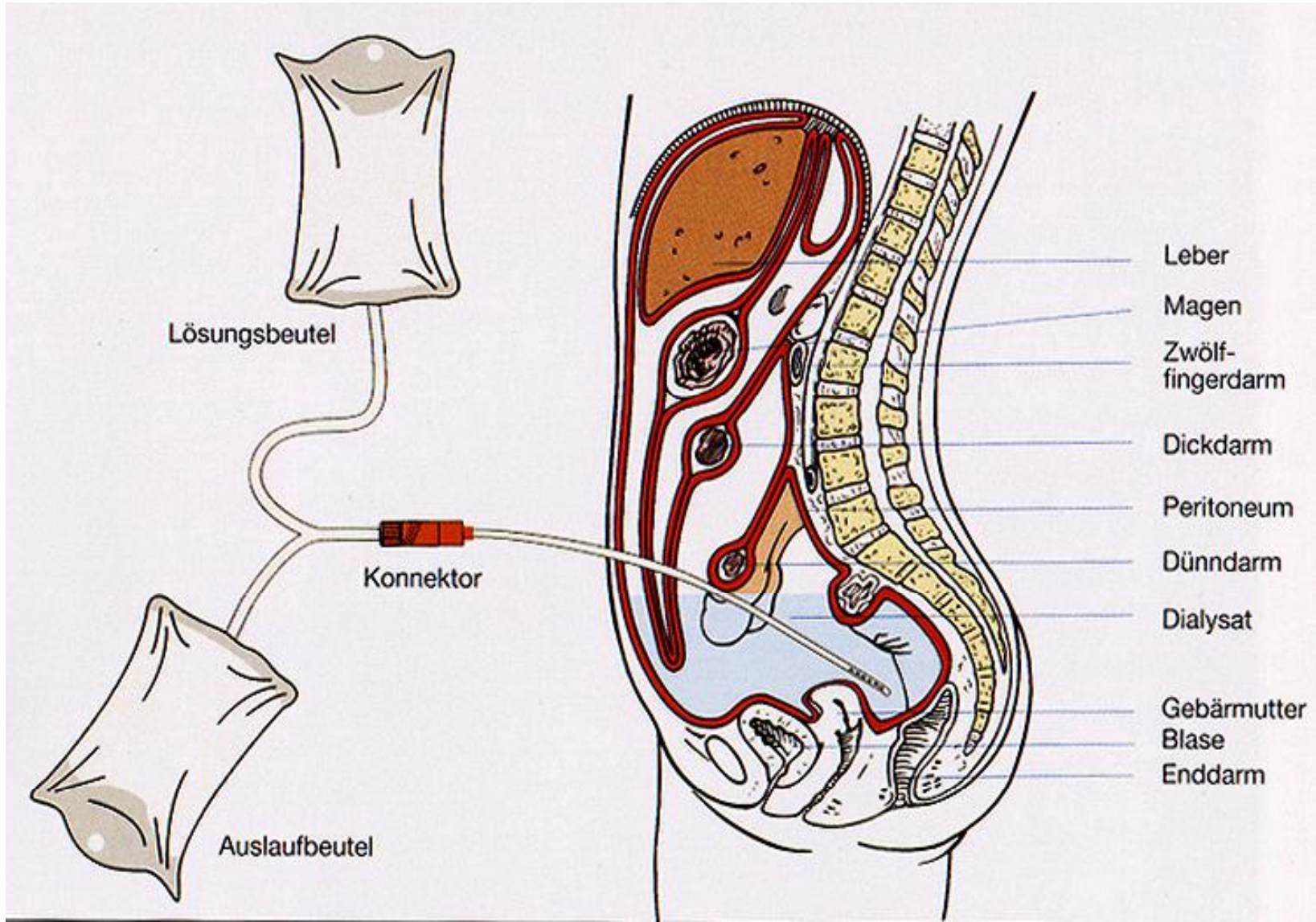
3. Erhalt der renalen  
Restfunktion?

4. Lebensqualität?

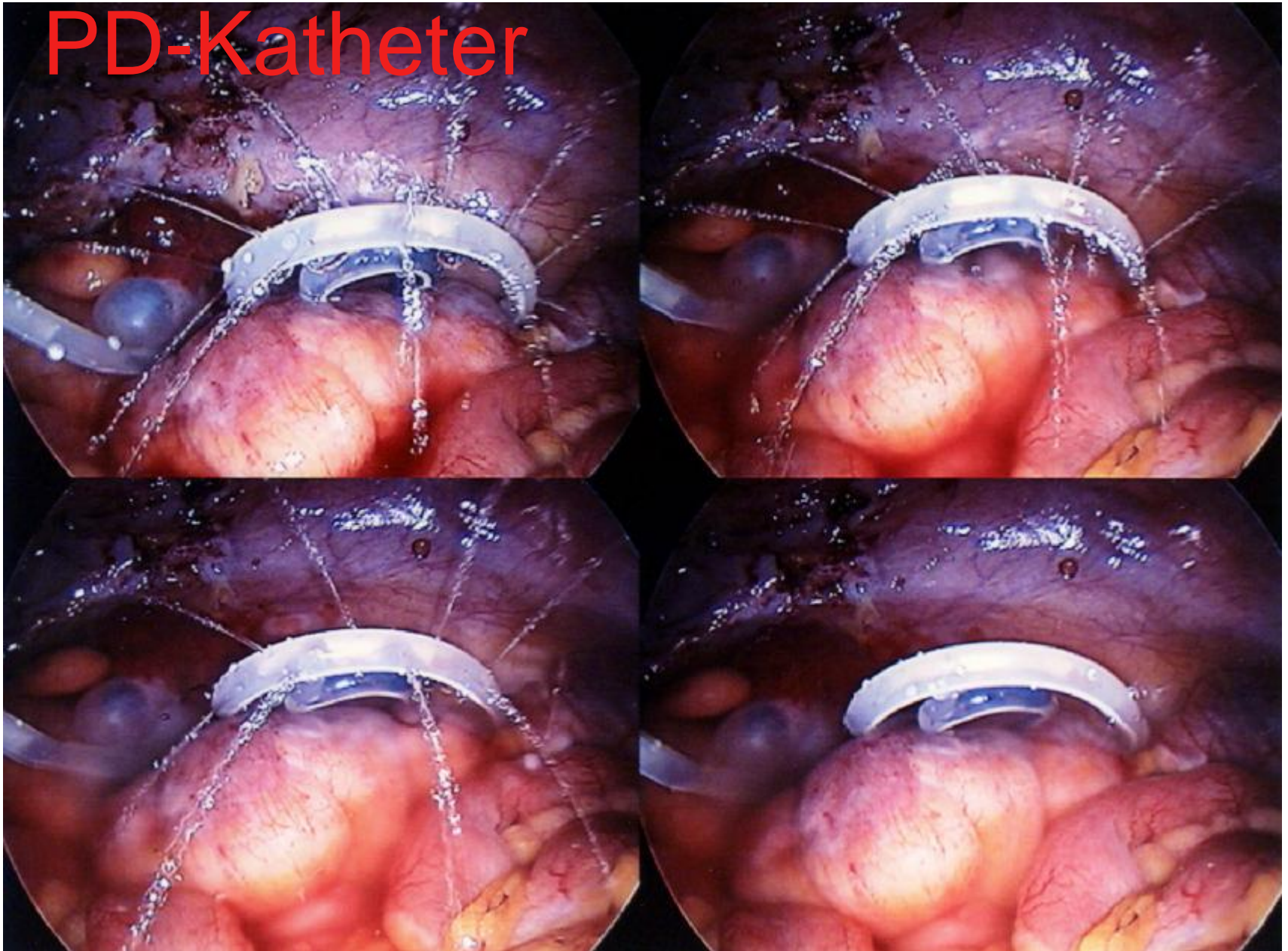
# Gründe für den Wechsel von der PD zur HD



Nach R. Gokal, PDI 1996



# PD-Katheter

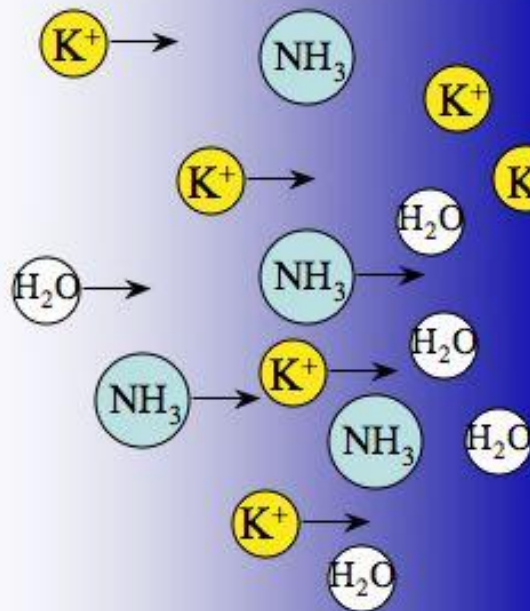


**Freies Anspülen des Katheters und regelrechte Auslauffunktion  
nach laparoskopischer Kathetermobilisation**

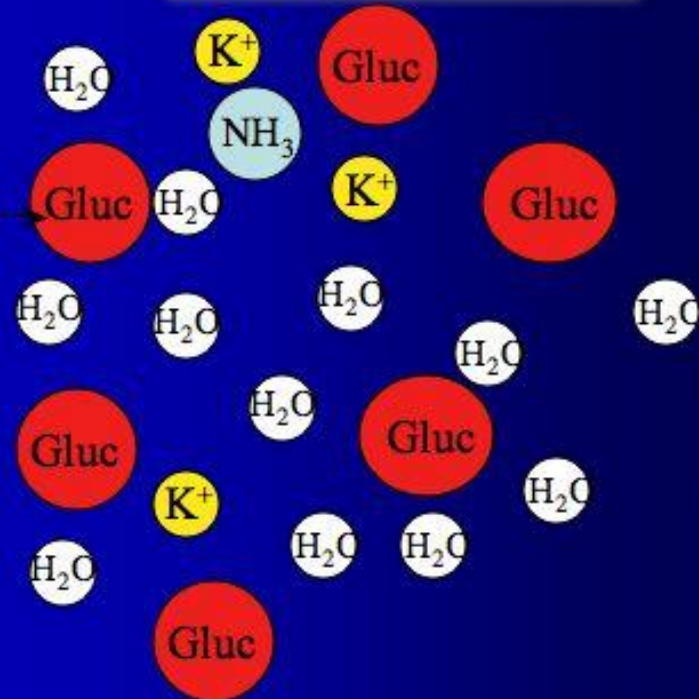


# Prinzip des peritonealen Stoff- und Wassertransportes

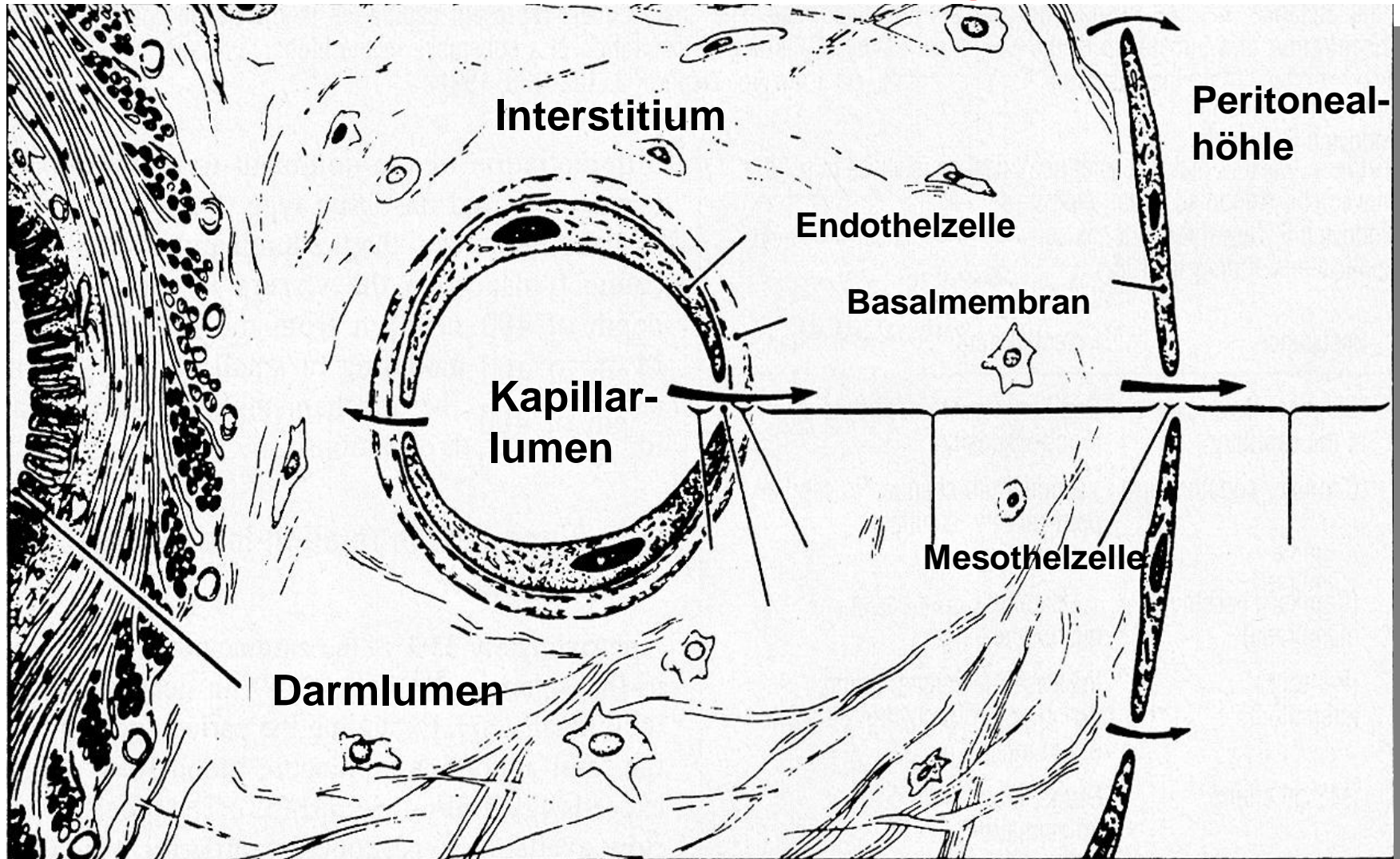
Interstitium



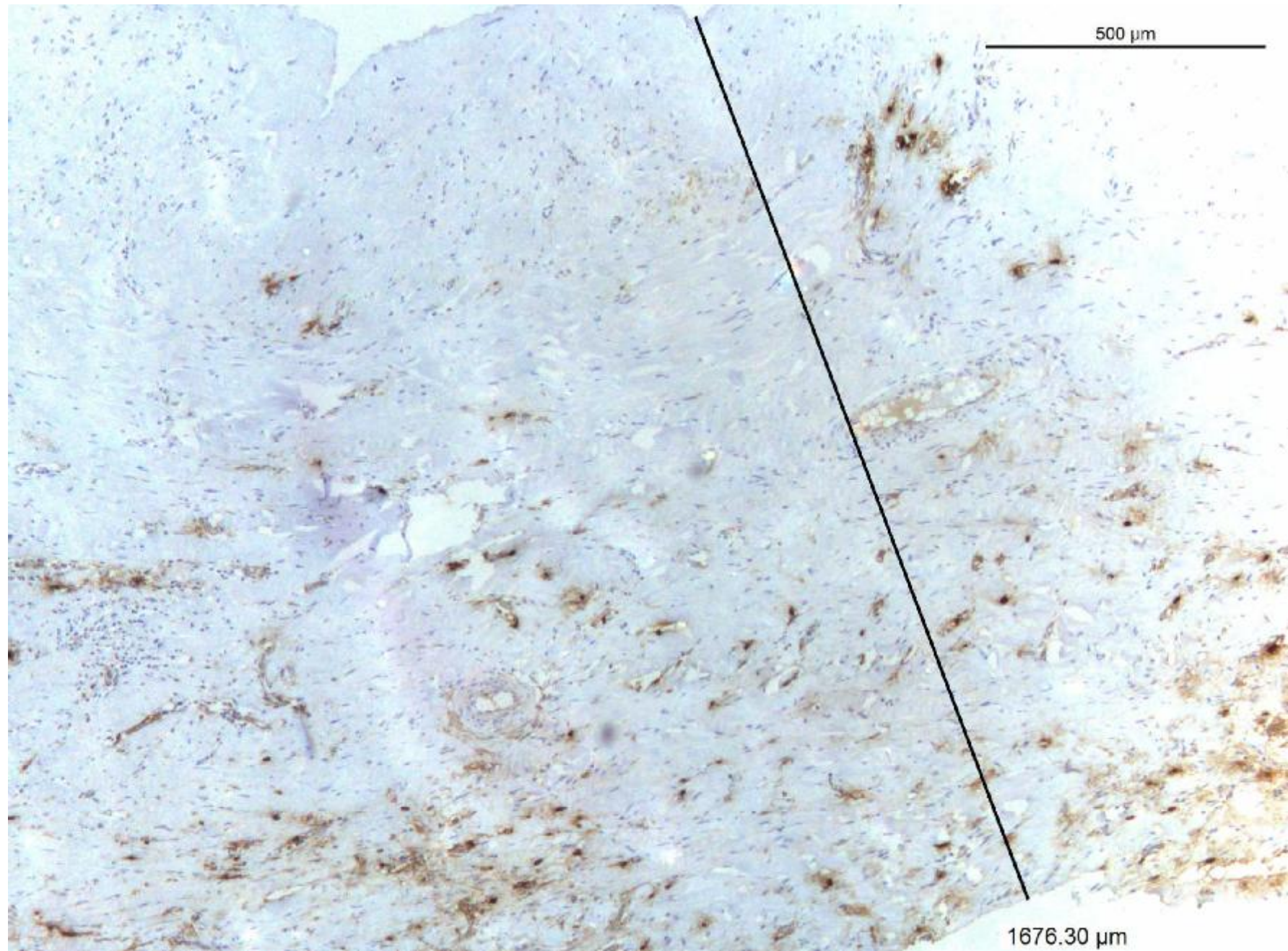
Dialysatseite



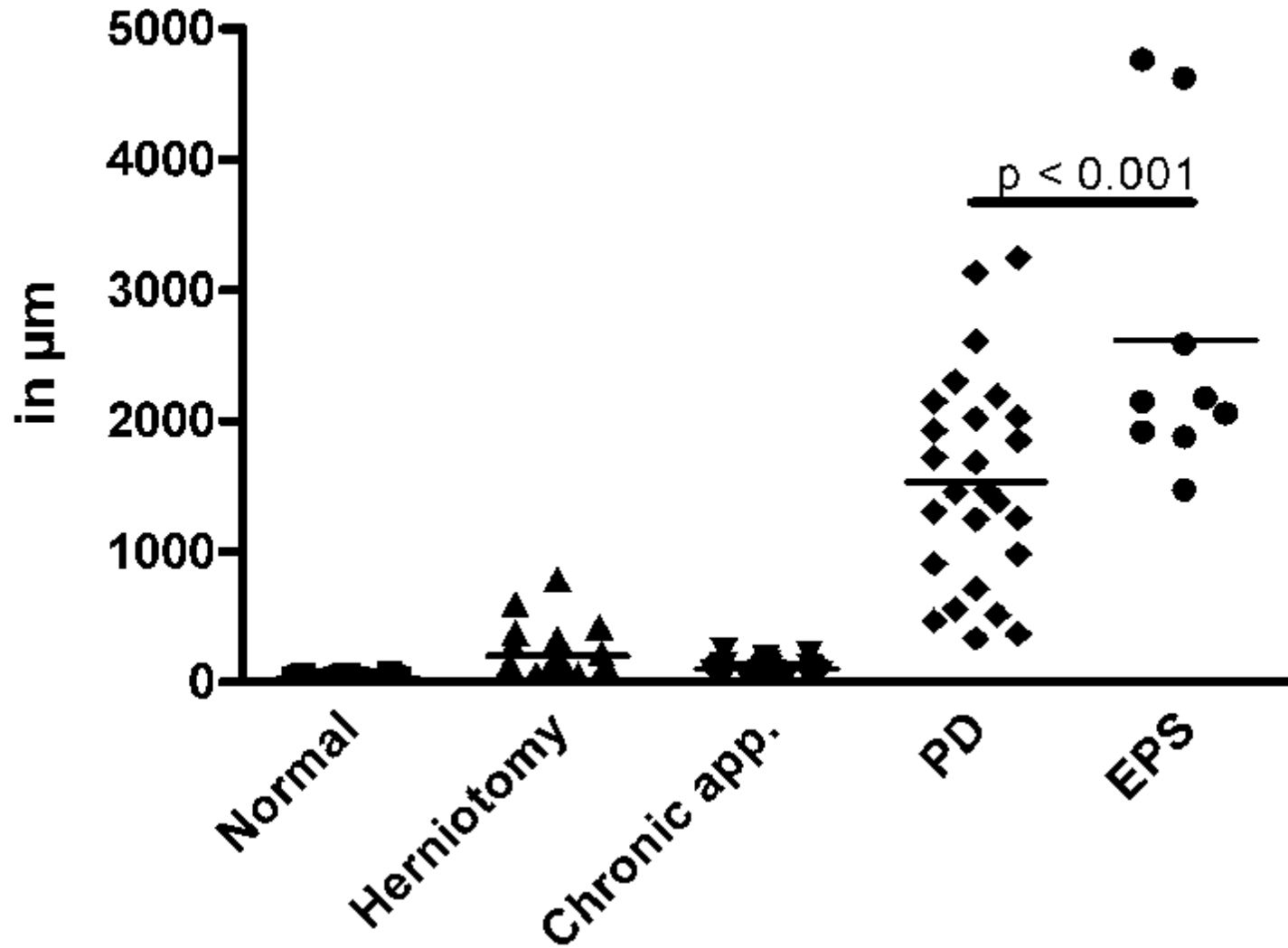
# Schematische Darstellung der peritonealen Transportwege



# Peritoneum

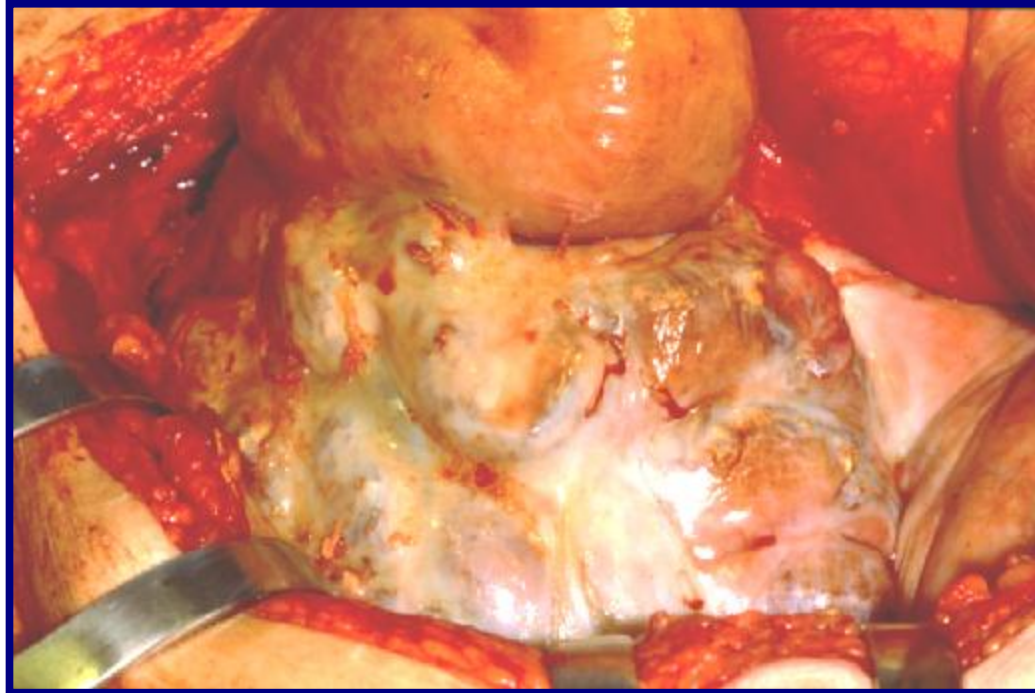


# Peritonealfibrosis



Alscher et al. AJKD in rev.

# Zuckergussdarm = EPS



P. Winnen: Über Zuckergussdarm  
(Peritonitis chronica fibrosa incapsulata).  
Brunns Beitr Klein Chir 1921, 123:72

# EPS-Definition/ Diagnose:

## Trias aus Klinik, Bildgebung, Pathologie

### **Klinik:**

UF-Verlust, Anstieg D/P-Cr

Hämorrhagische Ausläufe

„Entzündung“, Peritonitis („recurrent or non resolving“)

Subileus, Ileus

### **Bildgebung (CT):**

Verdickung Peritoneum

Intestinale Obstruktionen

Wassersack („cocoon“)

Kalzifikationen

### **Pathologie** (typisch, aber nicht pathognomonisch):

Ausgedehnte peritoneale Fibrose/ Sklerose

Verkapselnde Membran aus fibrinösem, homogenen Material

Perivaskuläre Blutungen

Fibrin, Fibroblasten

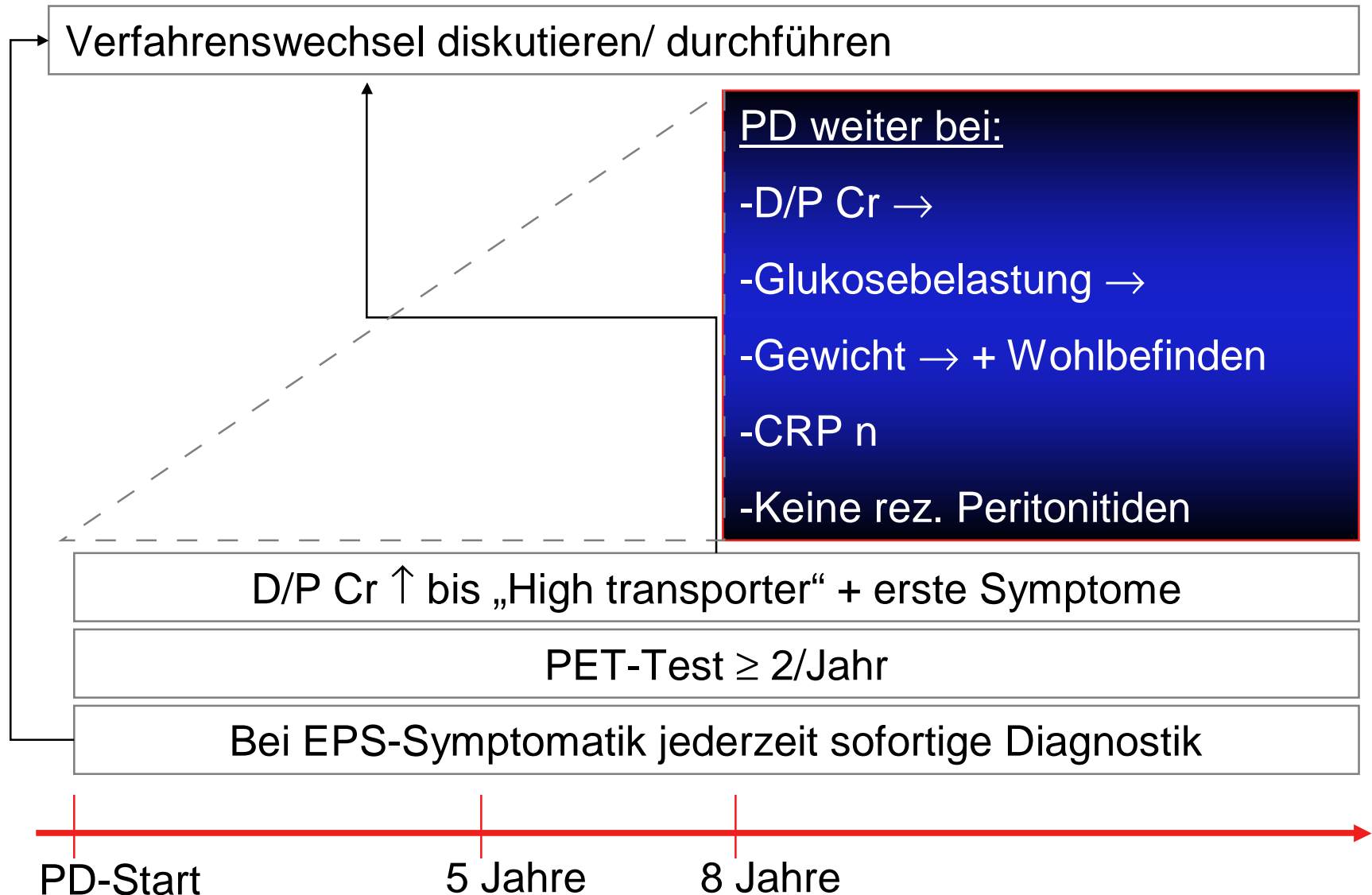
# Auftreten, Mortalität in Abhängigkeit von PD-Dauer

TABLE 3  
Incidence and Outcome of Encapsulating Peritoneal Sclerosis (EPS) in Relation to Time on Peritoneal Dialysis (PD)

PD duration (years)	Patients (n)	EPS incidence [n (%)]	Mortality [n (%)]	Recovery [n (%)]
<3	337	0	—	—
3 – <5	554	4 (0.7)	0 (0)	4 (100)
5 – <8	576	12 (2.1)	1 (8.3)	10 (83.3)
8 – <10	239	14 (5.9)	4 (28.6)	6 (42.9)
10 – <15	223	13 (5.8)	8 (61.5)	2 (15.3)
≥15	29	5 (17.2)	5 (100)	0 (0)
Overall	1958	48 (2.5)	18 (37.5)	22 (45.8)

8-Jahre

# Vorgehen zur Prävention EPS

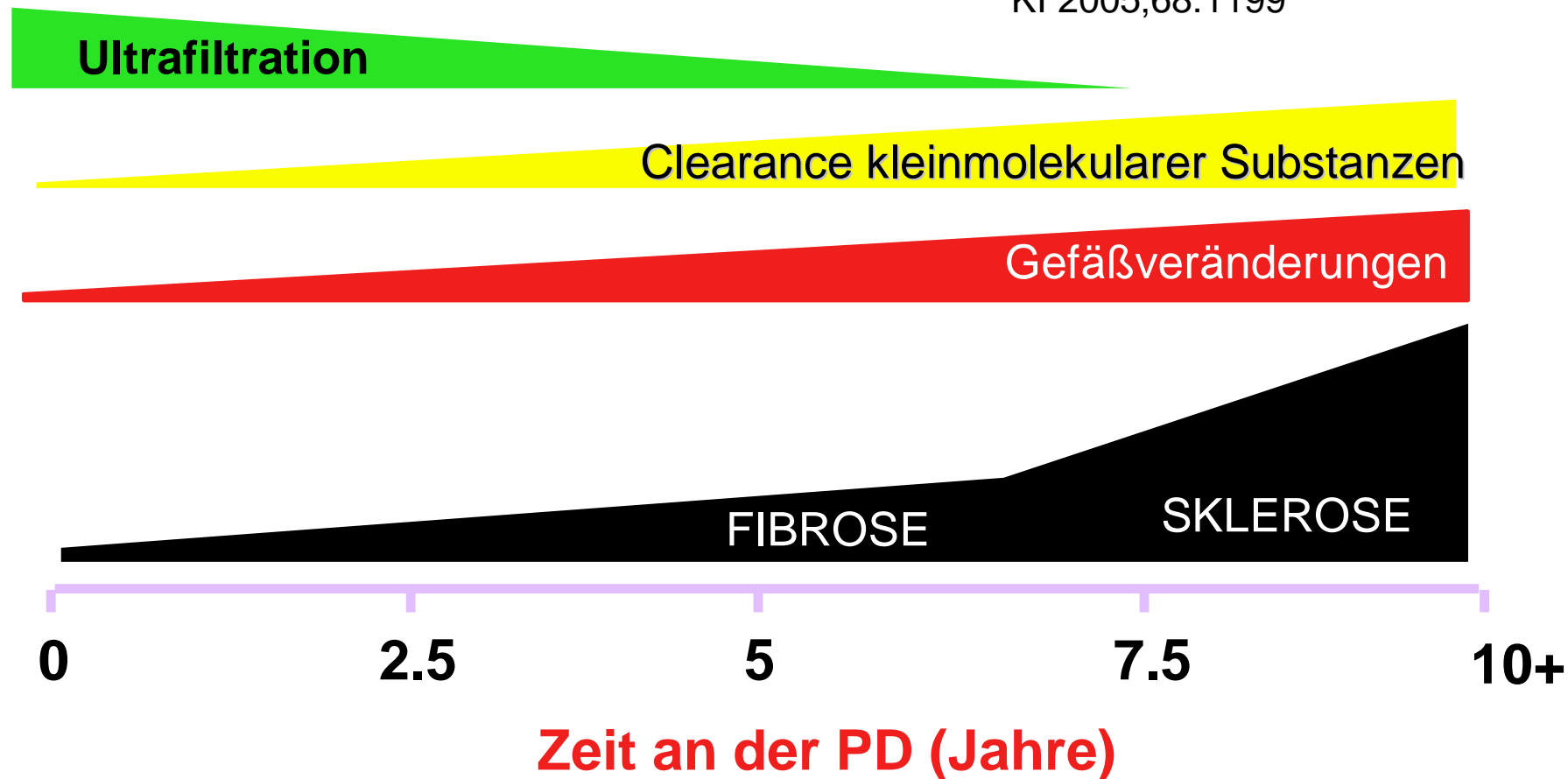


# Veränderungen des Peritoneum während der Peritonealdialyse

Technisches Überleben ( $\emptyset$ RRF):

2 Jahre: 73% 5 Jahre: 70%

KI 2005;68:1199



# Vorteile der Peritonealdialyse als erste Therapiemodalität:

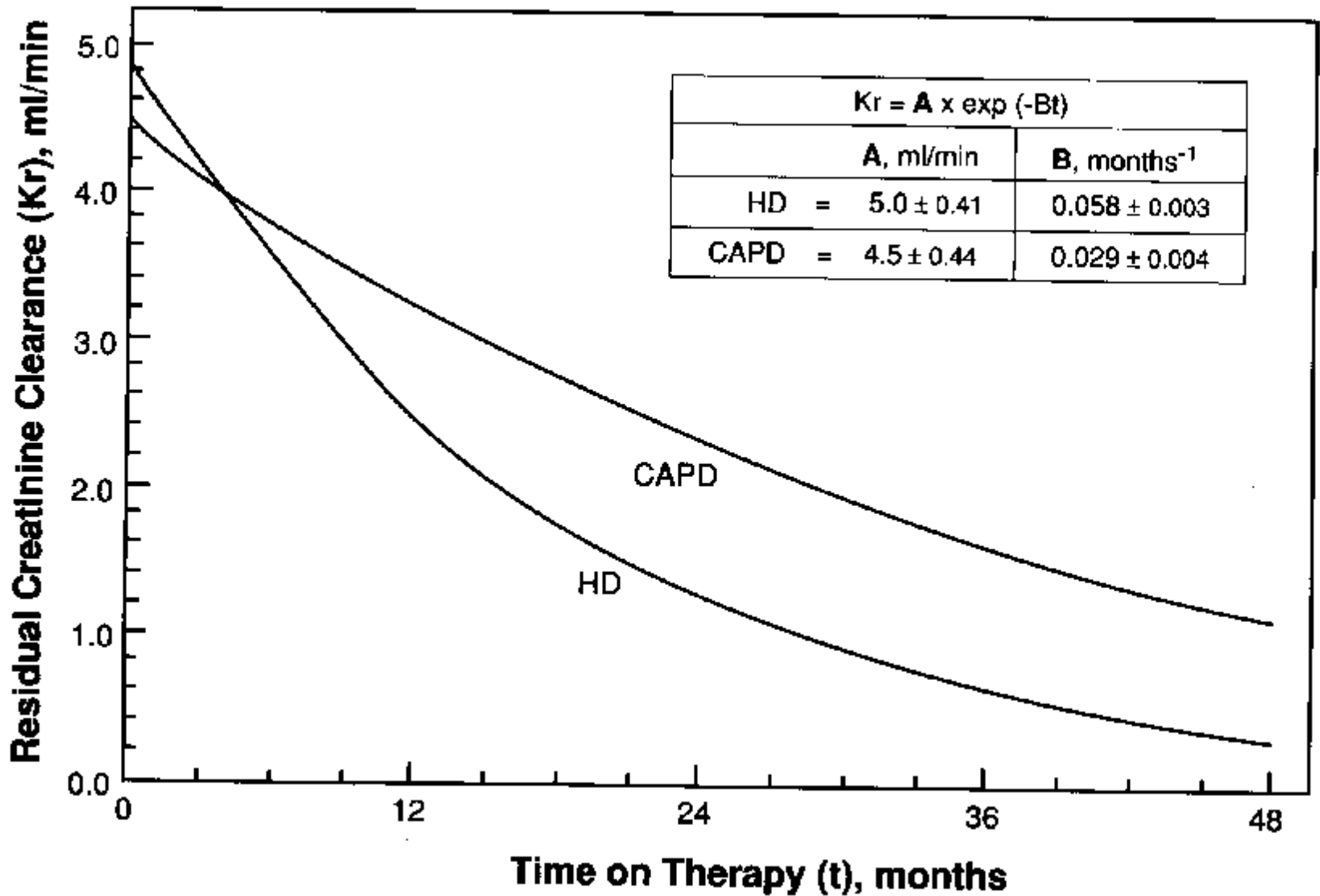
1. Überleben?

2. Morbidität?

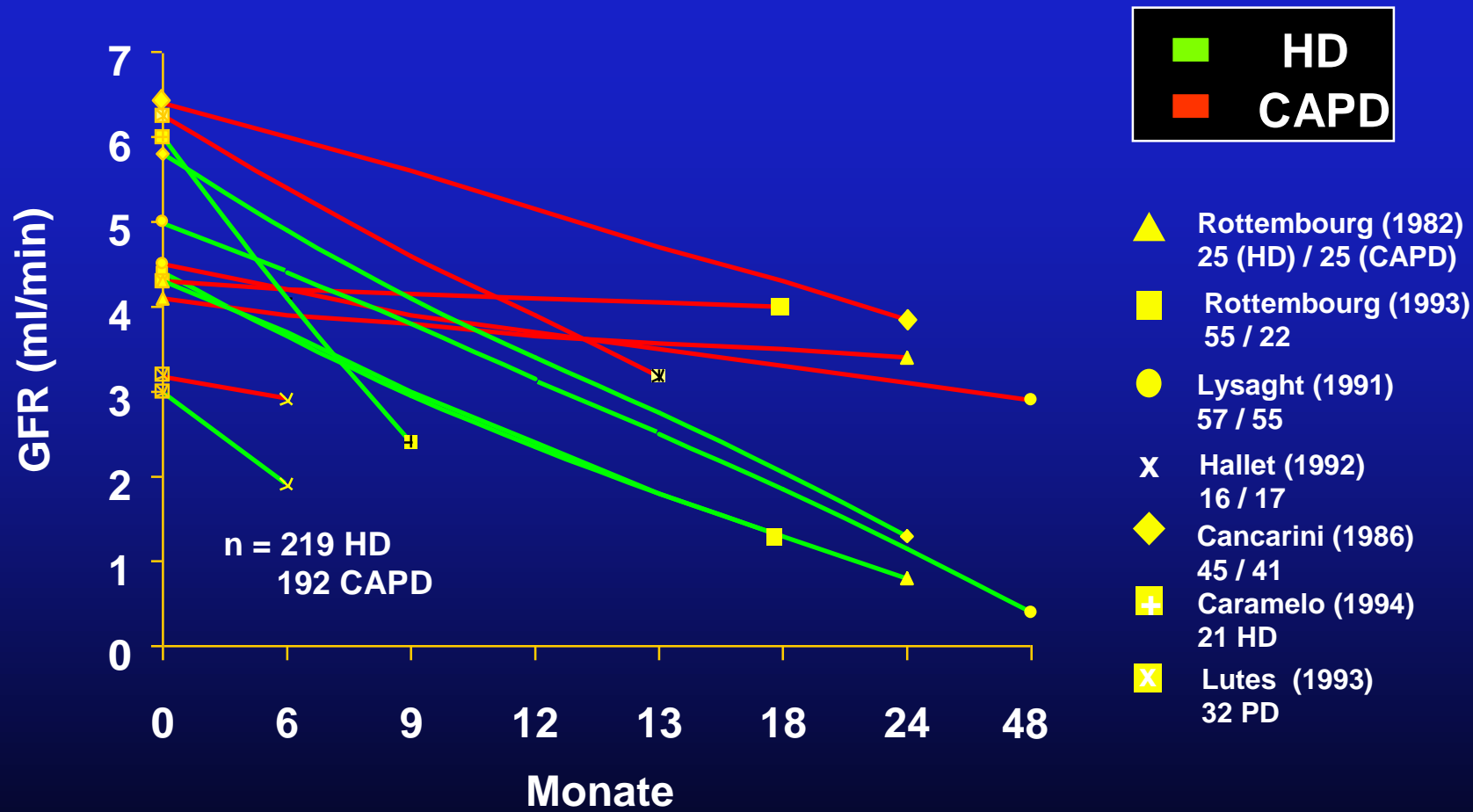
3. Erhalt der renalen  
Restfunktion?

4. Lebensqualität?

# Lysacht M et al. ASAIO Trans, 1991



# Nierenrestfunktion



Nierenrestfunktion (GFR) in Abhängigkeit von Dialyseverfahren

# Renale Restfunktion nach Dialysebeginn

## Vergleich HD vs. PD

Prospektive Untersuchung an

- 300 HD und
- 175 PD-Patienten

HD-Pat. wurden behandelt mit

- biocompatiblen high-flux-Filter
- ultrareinem Wasser.

Engmaschige Bestimmung der

- Harnstoff- und
- Krea-Clearance.

Erebnisse:

identische Reduktion der RRF

bei HD und PD-Patienten über 5 Jahre

# Vorteile der Peritonealdialyse als erste Therapiemodalität:

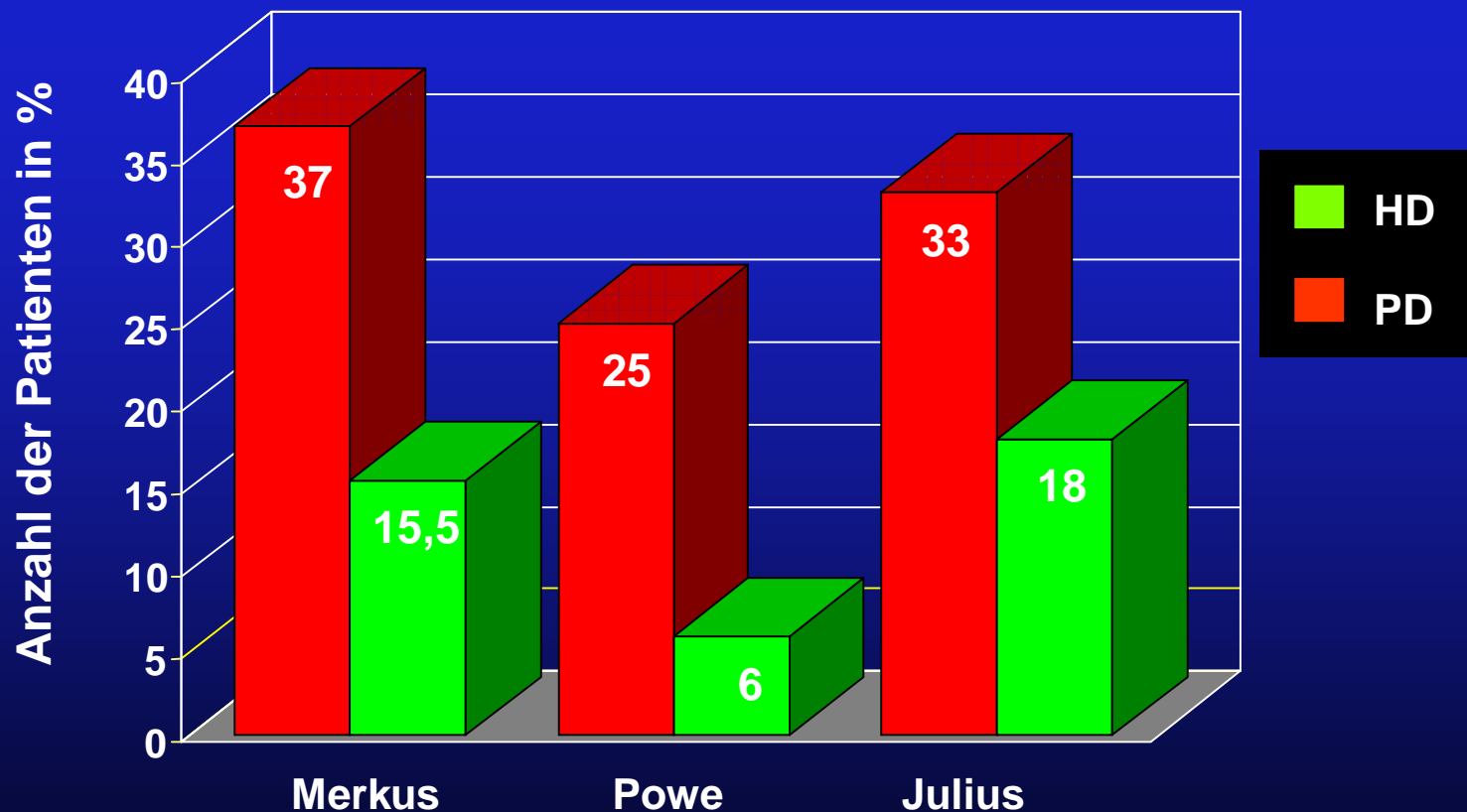
1. Überleben?

2. Morbidität?

3. Erhalt der renalen Restfunktion?

4. Lebensqualität?

# Nierenersatzverfahren & Berufstätigkeit

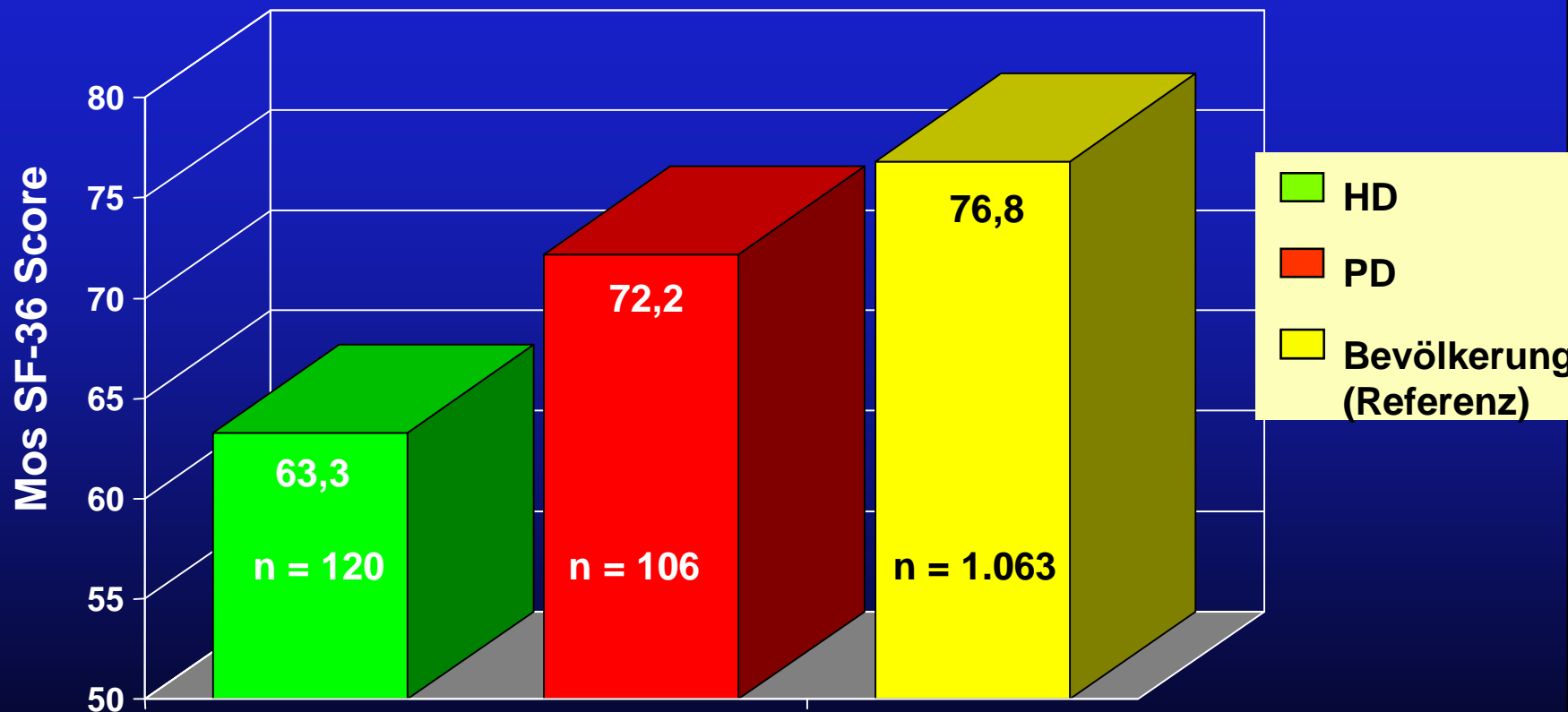


Merkus et al., Am J Kid Dis 29 (4), 1997

Powe, N., RPA/REF Annual Meeting, 1997

Julius, M. et al., Michigan End-Stage Disease Study, Arch Intern Med. 1989

# Nierenersatzverfahren & Lebensqualität



Merkus et al., Am J Kid Dis 29 (4), 584-592, 1997

# Lebensqualität PD versus HD

**Table 1.** Characteristics of Participants With Complete Questionnaires From 37 Centers Enrolling Both Peritoneal Dialysis (PD) and Hemodialysis (HD) Patients by Baseline Modality

Characteristic	No. of Respondents	HD Patients, No. (%) (n = 336)	PD Patients, No. (%) (n = 185)	P Value
Age at enrollment, mean (SD) y	521	56.5 (15.1)	53.6 (14.3)	.03
Female	521	151 (44.9)	80 (43.2)	.71
White	521	210 (62.5)	148 (80.0)	<.001
High school graduate	514	234 (70.5)	151 (83.0)	.002
Married	519	179 (53.6)	124 (67.0)	.003
Working	521	38 (11.3)	52 (28.1)	<.001
Distance from dialysis center <48 km	505	294 (89.1)	122 (69.7)	<.001
Days receiving dialysis, mean (SD)	521	58.2 (33.9)	40.4 (33.6)	<.001
MOS SF-36 MCS, mean (SD)	506	45.7 (11.3)	47.0 (11.5)	.24
MOS SF-36 PCS, mean (SD)	506	32.0 (9.7)	34.0 (9.5)	.03
ICED score $\geq 2$	521	240 (71.4)	94 (50.8)	<.001

Abbreviations: ICED, Index of Coexistent Disease; MOS SF-36 MCS, Medical Outcomes Study Short-Form 36 Mental Component Score; MOS SF-36 PCS, Medical Outcomes Study Short-Form 36 Physical Component Score.

**Table 2. Probabilities of Excellent Ratings by Hemodialysis (HD) and Peritoneal Dialysis (PD) Patients**

PD/HD >1 = PD better

Satisfaction Domain and Item	No. of Excellent Ratings/ No. of Respondents (%)*		PD Adjusted % (95% CI)†	PD/HD	
	HD Patients	PD Patients		Unadjusted Relative Probability (95% CI)	Adjusted Relative Probability (95% CI)
<b><u>Nephrologist</u></b>					
Correct amount of dialysis	123/384 (32)	110/187 (59)	56 (46-65)	1.84 (1.56-2.10)	1.75 (1.44-2.04)
Caring and concern	138/396 (35)	113/190 (60)	54 (44-63)	1.70 (1.45-1.94)	1.54 (1.26-1.81)
Availability					
Ease of reaching	122/396 (31)	98/191 (51)	46 (37-56)	1.67 (1.38-1.95)	1.49 (1.19-1.81)
Frequency of seeing	88/387 (23)	84/189 (44)	42 (33-52)	1.92 (1.50-2.37)	1.86 (1.43-2.31)
In mood to talk	140/392 (36)	112/192 (58)	55 (45-64)	1.63 (1.39-1.87)	1.53 (1.25-1.79)
Information					
Accuracy of information	98/380 (26)	104/188 (35)	51 (41-61)	2.14 (1.79-2.49)	1.97 (1.58-2.35)
Accuracy of instructions	118/388 (30)	106/191 (56)	50 (40-60)	1.82 (1.53-2.11)	1.65 (1.33-1.97)
Coordination with other physicians	81/386 (21)	78/190 (41)	37 (28-48)	1.95 (1.54-2.40)	1.77 (1.33-2.26)
<b><u>Dialysis Staff</u></b>					
Interpersonal					
Caring of nurses	226/396 (57)	160/193 (83)	80 (69-87)	1.44 (1.29-1.55)	1.39 (1.21-1.52)
Caring of staff	226/397 (57)	157/193 (81)	76 (66-84)	1.41 (1.26-1.53)	1.33 (1.15-1.48)
Response to pain	213/396 (54)	138/191 (72)	67 (56-76)	1.34 (1.17-1.48)	1.25 (1.05-1.42)
Technical aspects					
Amount of fluid removed	100/377 (27)	85/191 (45)	38 (29-48)	1.68 (1.35-2.02)	1.44 (1.10-1.81)
New medical problems	134/390 (34)	126/191 (66)	61 (51-70)	1.96 (1.67-2.20)	1.76 (1.48-2.02)
Attention to cleanliness of access site	213/392 (54)	152/192 (79)	75 (65-83)	1.47 (1.31-1.59)	1.39 (1.19-1.54)
Availability					
Ease of reaching staff	185/396 (47)	140/192 (73)	68 (57-77)	1.57 (1.38-1.73)	1.45 (1.23-1.64)
Staff available in emergency	200/395 (51)	132/190 (70)	67 (56-75)	1.36 (1.18-1.52)	1.31 (1.11-1.49)
Ease of seeing social worker	145/392 (37)	130/192 (68)	64 (55-73)	1.83 (1.60-2.03)	1.74 (1.48-1.97)
Information					
Amount of information on choosing HD or PD	99/382 (26)	134/193 (69)	69 (57-78)	2.72 (2.35-3.04)	2.65 (2.21-3.02)
Information about fluid removal	126/392 (32)	127/193 (66)	62 (52-71)	2.05 (1.78-2.29)	1.92 (1.62-2.20)
Amount of dialysis information	129/394 (33)	137/193 (71)	68 (58-76)	2.18 (1.91-2.41)	2.07 (1.78-2.32)
<b><u>Overall Ratings</u></b>					
Quality of dialysis care	224/398 (56)	163/193 (85)	82 (74-89)	1.50 (1.36-1.59)	1.46 (1.31-1.57)
How much could be better?‡	155/394 (39)	112/186 (60)	67 (55-77)	1.59 (1.31-1.83)	1.70 (1.39-1.95)
Would you recommend your center?§	298/400 (75)	175/192 (91)	90 (83-94)	1.22 (1.15-1.27)	1.20 (1.11-1.26)

Abbreviation: CI, confidence interval.

\*The number of respondents included complete and partially complete questionnaires.

†Models for each item are adjusted for age (<40, 40-65, >65 years), sex, race (white vs nonwhite), education (high school degree vs not), marital status (currently married vs not married), employment status (currently employed full-time or part-time vs not employed), Index of Coexistent Disease score (0-1 vs 2-3), Medical Outcomes Study Short-Form 36 Mental Component and Physical Component scores, distance from center (<48 km vs not), and time since starting dialysis.

‡Percentages and probabilities of the best possible response, "nothing at all."

§Percentages and probabilities of the best possible response, "definitely yes."

# Clinical outcomes, quality of life, and costs in the North Thames Dialysis Study of elderly people on dialysis: a prospective cohort study

Number	Number		RR	
	at risk	of deaths	(95% CI)	(95% CI)
<b>Age group (years)</b>				
70-74	60	12 (20%)	1.00	1.00
75-79	35	11 (31%)	1.74 (0.77-3.95)	1.33 (0.54-3.32)
≥80				
<b>Sex</b>				
Female				
Male				
<b>Treatment method</b>				
Haemodialysis				
Peritoneal dialysis				



# Lebensqualität bei älteren PD-Patienten

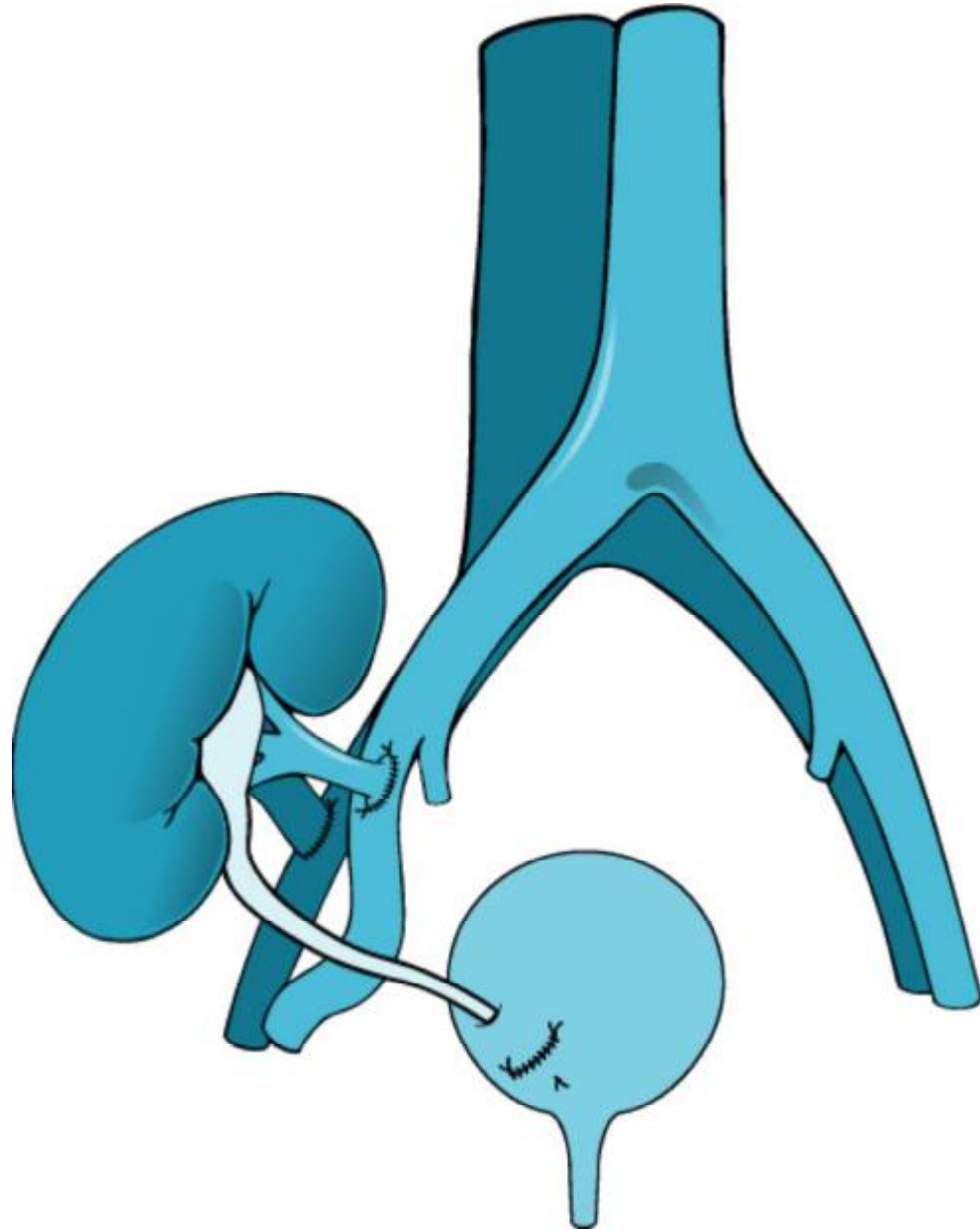
SF-36	NTDS	UK	USA
	> 70 J	> 70 J	> 70 J
	n = 78	n = 333	n = 264
Körperliche...	34	41	38
Geistige...	51	53	50
...Lebensqualität			

„Our main conclusions are that age alone should not be used as a barrier to referral and treatment...”

# Vorteile der Peritonealdialyse als erste Therapiemodalität:

- + 1. Überleben = Besser (2y)
- (-) 2. Morbidität = Anders
- (+) 3. Erhalt der renalen Restfunktion = Besser
- + 4. Lebensqualität = Besser

# Nierentransplantation



# The New England Journal of Medicine

## **COMPARISON OF MORTALITY IN ALL PATIENTS ON DIALYSIS, PATIENTS ON DIALYSIS AWAITING TRANSPLANTATION, AND RECIPIENTS OF A FIRST CADAVERIC TRANSPLANT**

**ROBERT A. WOLFE, PH.D., VALARIE B. ASHBY, M.A., EDGAR L. MILFORD, M.D., AKINLOLU O. OJO, M.D., PH.D.,  
ROBERT E. ETTENGER, M.D., LAWRENCE Y.C. AGODOA, M.D., PHILIP J. HELD, PH.D., AND FRIEDRICH K. PORT, M.D.**

1999;341:1725-30



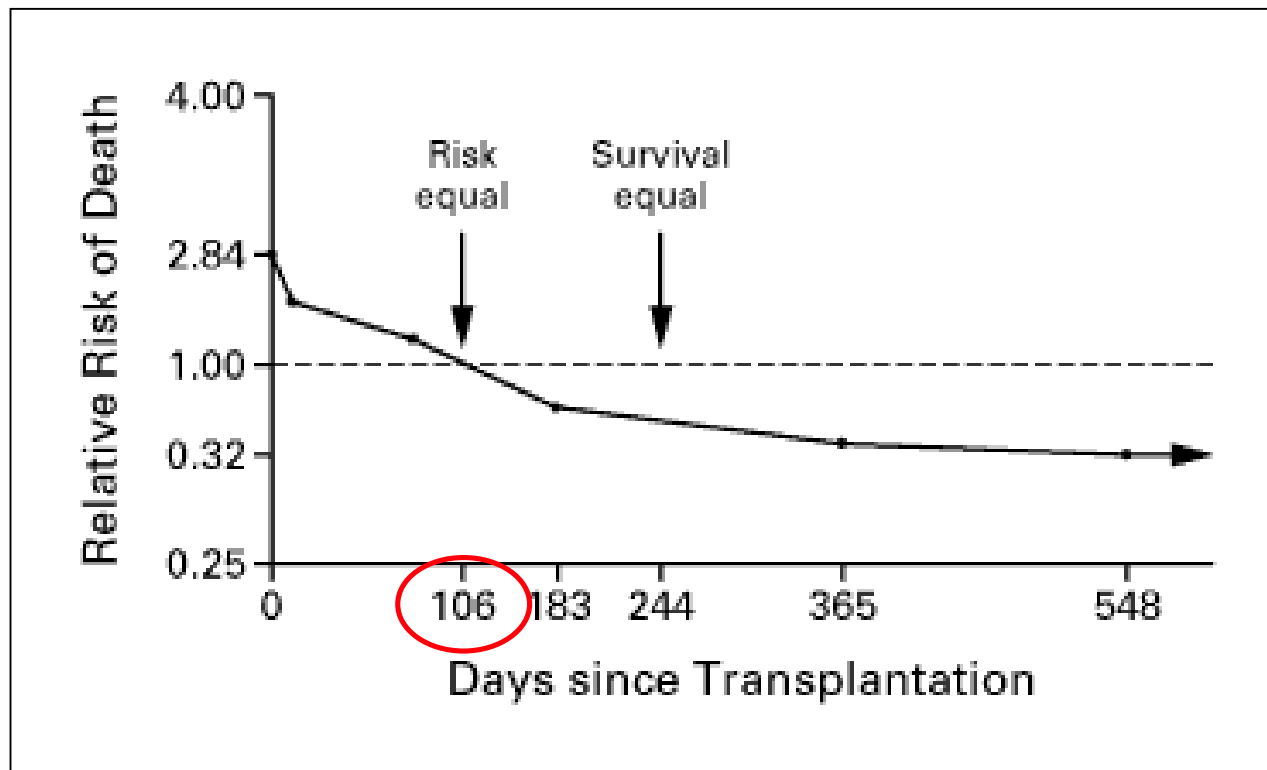
# Mortality bei Nierenersatz

**TABLE 2.** ANNUAL DEATH RATES AND TOTAL NUMBERS OF DEATHS, 1991–1997.

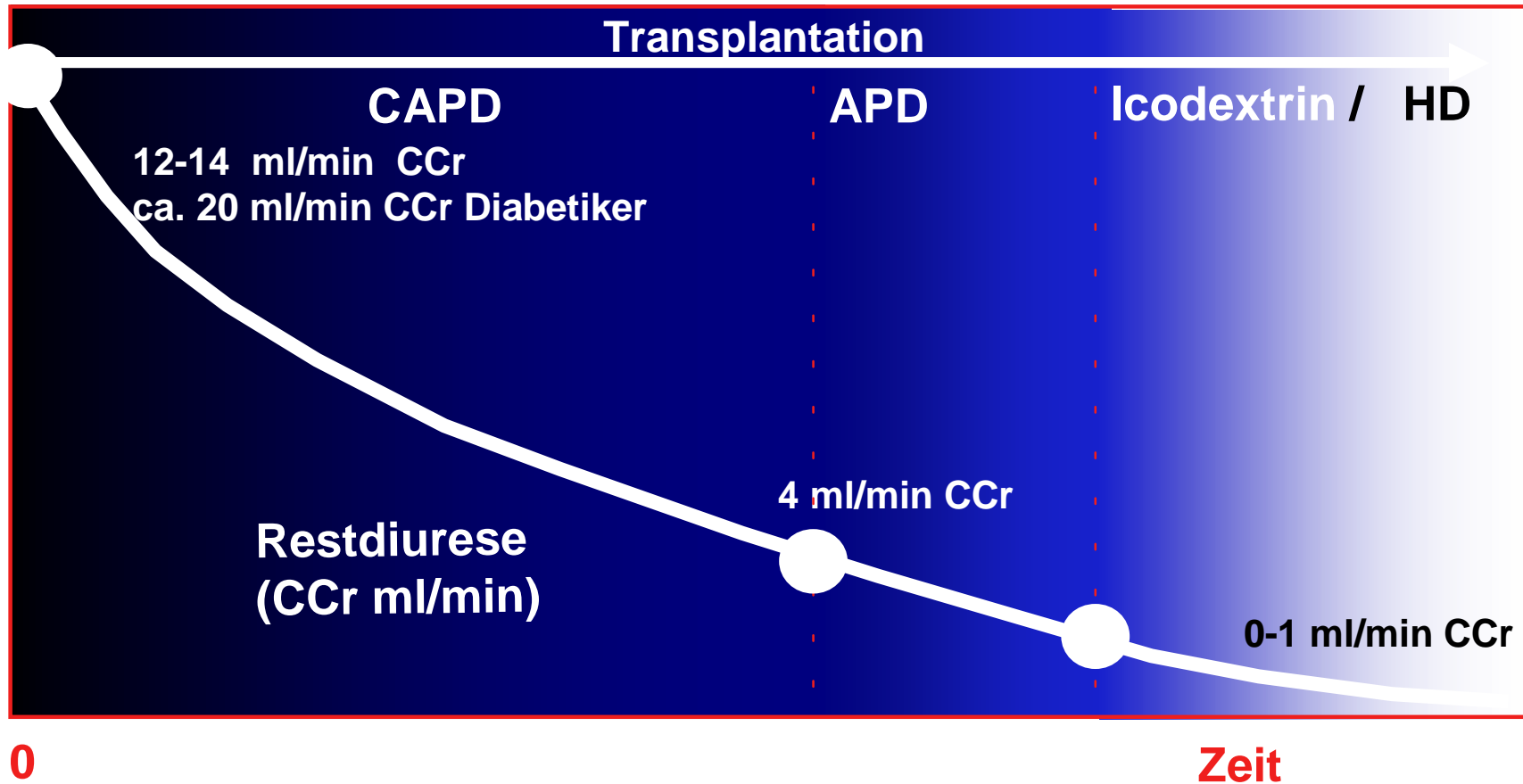
VARIABLE	ALL PATIENTS ON DIALYSIS (N=228,552)		PATIENTS ON THE WAITING LIST (N=46,164)		RECIPIENTS OF CADAVERIC TRANSPLANTS (N=23,275)	
	RATE/100 PATIENT-YR	NO. OF DEATHS	RATE/100 PATIENT-YR	NO. OF DEATHS	RATE/100 PATIENT-YR	NO. OF DEATHS
All patients	16.1	84,713	6.3	4353	3.8	2436
Age*						
0–19 yr	3.6	257	2.2	31	0.9	21
20–39 yr	8.6	7,499	4.3	897	2.3	500
40–59 yr	13.3	30,935	6.5	2372	4.1	1293
≥60 yr	23.2	46,022	10.0	1053	7.4	622
Sex						
Male	16.2	45,366	6.3	2556	3.9	1590
Female	16.1	39,347	6.3	1797	3.5	846
Race						
White	19.3	55,786	7.5	2993	3.9	1859
Black	12.4	25,733	4.8	1168	3.4	478
Asian	9.9	1,783	3.0	108	2.6	64
Native American	13.3	1,411	6.5	84	4.7	35
Cause of end-stage renal disease						
Diabetes	19.9	44,916	10.8	2312	5.6	1091
Other	13.3	39,797	4.3	2041	3.0	1345

\*The ages shown are the age at the time of the first treatment for end-stage renal disease in the group of all patients on dialysis (age limit, 69 years), the age at the time of initial placement on the waiting list for patients on the waiting list, and the age at transplantation for transplant recipients.

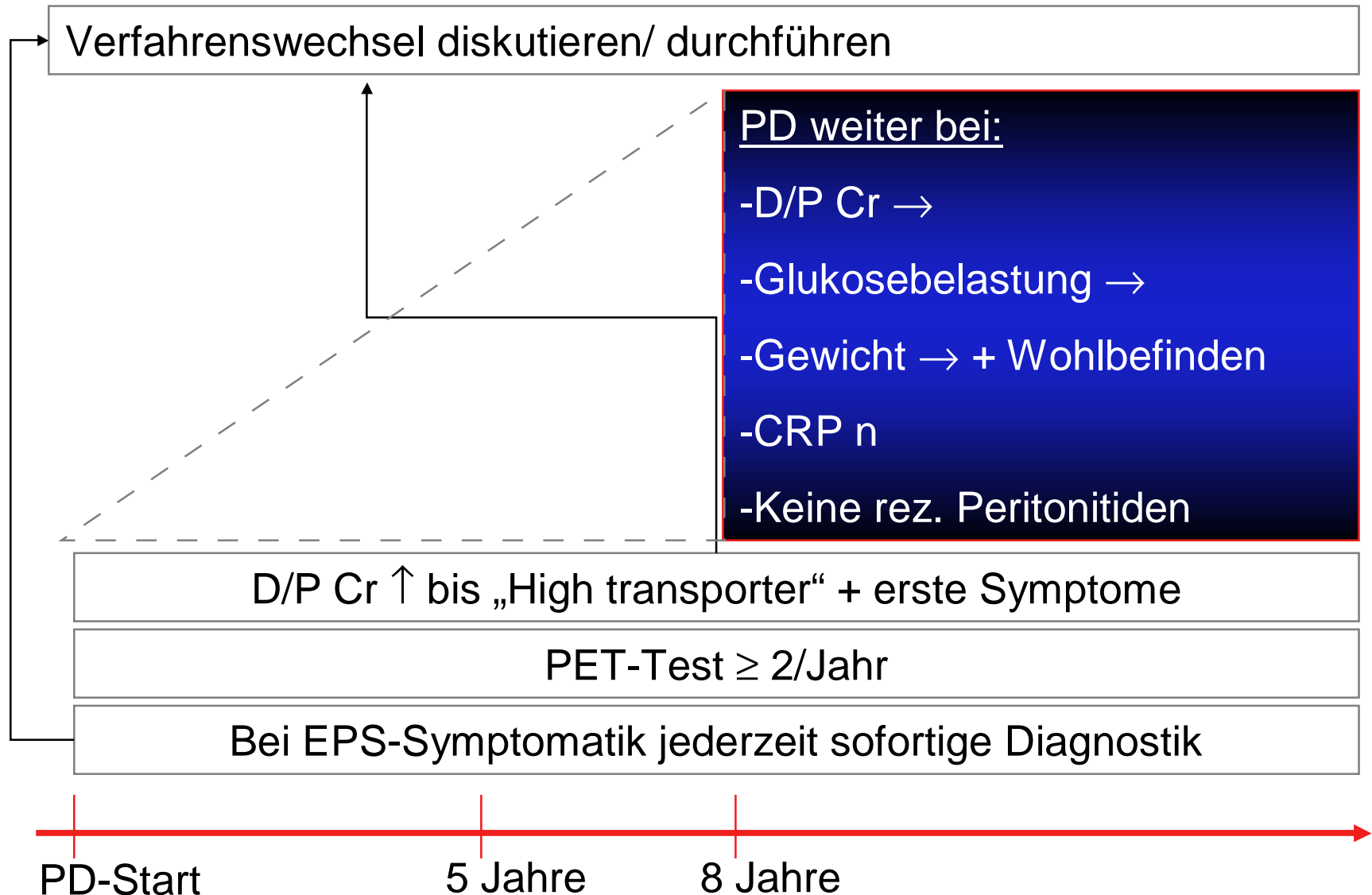
# Mortalität bei Nierenersatz



# Therapieschema



# Vorgehen zur Prävention EPS



# PD in Deutschland

Bundesland/KV	KV-Bezirk	Rückmel- dung (%)	Dialyse- patienten	Prävalenz (pmp)	Peritonealdia- lysepatienten	Anteil (%) PD an Dialyse- verfahren*
Baden-Württemberg		87	6.920	646	464	6,7
	Nordbaden	83	2.030	744	149	7,3
	Nordwürttemberg	87	2.420	605	140	5,8
	Südbaden	94	1.614	739	99	6,1
	Südwestfalen	81	856	475	76	8,9
Bayern		83	9.166	737	443	4,8
Berlin		100	2.782	821	143	5,1
Brandenburg		98	2.018	786	87	4,3
Bremen		100	628	947	31	4,9
Hamburg		67	944	544	26	2,8
Hessen		87	4.276	701	260	6,1
Mecklenburg-Vorpommern		89	1.462	850	24	1,6
Niedersachsen		94	5.551	694	231	4,2
Nordrhein-Westfalen		88	12.991	719	615	4,7
	Nordrhein	90	6.870	717	429	6,2
	Westfalen-Lippe	86	6.121	721	186	3,0
Rheinland-Pfalz		96	3.534	870	174	4,9
	Koblenz	92	1.123	735	28	2,5
	Pfalz	100	1.243	871	67	5,4
	Rheinhessen	90	648	1.093	8	1,2
	Trier	100	520	1.004	71	13,7
Saarland		89	985	932	62	6,3
Sachsen		98	3.475	809	75	2,2
Sachsen-Anhalt		90	2.356	945	95	4,0
Schleswig-Holstein		94	1.846	653	43	2,3
Thüringen		97	2.058	874	51	2,5
<b>Deutschland</b>		<b>90</b>	<b>60.992</b>	<b>739</b>	<b>2.824</b>	<b>4,6</b>
Berlin/Brandenburg		99	4.800	806	230	4,8
Niedersachsen/Bremen		94	6.179	713	262	4,2
Rheinland-Pfalz/Saarland		94	4.519	883	236	5,2
Schleswig-Holstein/Hamburg		86	2.790	611	69	2,5

