

***Online supplement:***

**Title:**

**Comparing Mortality of Peritoneal and Hemodialysis Patients in the First  
Two Years of Dialysis Therapy: A Marginal Structural Model Analysis**

(Running Head: Mortality among PD vs. HD Patients)

(Category: ESRD and chronic dialysis)

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**Online supplement:****Table 1.S.** Characteristics of 23,718 incident dialysis patients by modality status at Day 90, and by modality switches over the first 2 years, in DaVita dialysis clinics from July 1, 2006 through June 30, 2006.

	<b>HD (N=23,718)</b>		<b>p</b>	<b>Total (N=1,956)</b>		<b>p</b>
<b>Variables</b>	<b>HD</b>	<b>PD</b>		<b>HD switched modality</b>	<b>PD Switched modality</b>	
	<b>N=22,360</b>	<b>N=1,358</b>		<b>N=1,184</b>	<b>N=772</b>	
Age	63±15	57±15	<.0001	54±15	56±15	0.002
Gender (% female)	46%	47%	0.37	42%	47%	0.7
Diabetes mellitus (%)	62%	55%	<.0001	51%	56%	0.02
Race (%)						
White	44%	53%	<.0001	51%	48%	0.22
Black	29%	20%	<.0001	25%	23%	0.37
Hispanic	17%	15%	0.01	13%	17%	0.03
Asian	3%	6%	<.0001	5%	5%	0.97
Other	7%	7%	0.96	6%	7%	0.43
Primary insurance (%)						
Medicare	60%	45%	<.0001	52%	50%	0.41
Medicaid	7%	3%	<.0001	5%	4%	0.21
Other	32%	51%	<.0001	42%	46%	0.17
Employment status (%)						
Retired	54%	43%	<.0001	41%	42%	0.68
Employed	17%	38%	<.0001	31%	37%	0.002
Unemployed	29%	19%	<.0001	28%	20%	0.0001
Marital Status (%)						
Married	48%	64%	<.0001	54%	61%	0.02
Divorced	8%	7%	0.28	7%	6%	0.54
Single	27%	20%	<.0001	28%	23%	0.04
Widowed	17%	9%	<.0001	11%	10%	0.66
Comorbid Conditions (%)						
AIDS	1%	1%	0.68	0%	1%	0.55
Atherosclerotic Heart Disease	23%	17%	<.0001	21%	16%	0.007
Cancer	5%	3%	0.04	4%	4%	0.41
Heart Failure	29%	17%	<.0001	22%	17%	0.005
Pulmonary Disease COPD	6%	3%	<.0001	4%	4%	0.46
Cerebral-vascular disease CVA	8%	6%	0.01	5%	6%	0.25
HIV	1%	1%	0.35	2%	0%	0.02
History of Hypertension	80%	81%	0.2	79%	83%	0.01
Non-ambulatory	3%	1%	<.0001	2%	1%	0.02
Other Heart Diseases	5%	4%	0.03	4%	3%	0.5
Pulmonary Disease PVD	12%	9%	0.001	9%	9%	0.67
Smoker +	5%	5%	0.52	5%	6%	0.39

	HD (N=23,718)		p	Total (N=1,956)		p
Variables	HD	PD		HD switched modality	PD Switched modality	
	<i>N=22,360</i>	<i>N=1,358</i>		<i>N=1,184</i>	<i>N=772</i>	
Serum levels (at baseline)						
creatinine (mg/dL)	7.0±3.8	7.0±2.8	0.29	7.5±3.2	7.2±3.0	0.05
albumin (g/dL)	3.6±0.5	3.5±0.5	0.001	3.7±0.5	3.5±0.5	<.0001
Blood hemoglobin (g/dL)	12.1±1.4	12.3±1.4	<.0001	12.2±1.4	12.3±1.4	0.08
WBC (x10 <sup>3</sup> /vl)	7.7±2.5	7.5±2.7	0.05	7.7±2.5	7.4±2.3	0.03
Ferritin (ng/mL)	355±402	263±300	<.0001	338±411	255±493	<.0001
TIBC (mg/dL)	214±46	247±50	<.0001	225±47	247±49	0.02
Lymphocyte (% of total WBC )	20±7.5	20±7.4	0.05	20±7.4	20±7.4	0.23
Ca (mg/dL)	9.1±0.7	9.1±0.7	0.51	9.2±0.7	9.1±0.8	0.04
Phosphorous (mg/dl)	5.5±1.4	5.0±1.3	<.0001	5.5±1.4	5.0±1.3	<.0001
BMI (kg/m2)	26.7±7.2	26.7±5.9	0.89	27.2±6.5	26.9±6.2	0.6
Protein Catabolic Rate (g/kg/day)	0.93±0.25	0.97±0.3	0.09	0.91±0.3	0.90±0.3	0.69
PTH (pg/ml)	305±291	345±308	0.1	318±308	370±325	0.001

**Table 2.S.** Death hazard ratios (HR) for dialysis modality (PD vs. HD) in incident dialysis patients using Cox analysis (n=23,718). See also [Figure 3](#).

Survival period	Unadjusted	Cox Adjustment 1	Cox Adjustment 2
<b>Unmatched survival analyses</b>			
9 months (2 qtrs)	0.43 (0.33-0.53)	0.52 (0.41-0.66)	0.58 (0.48-0.73)
12 months (3 qtrs)	0.45 (0.37-0.54)	0.56 (0.41-0.67)	0.62 (0.51-0.75)
15 months (4 qtrs)	0.54 (0.44-0.60)	0.63 (0.54-0.74)	0.70 (0.59-0.62)
18 months (5 qtrs)	0.56 (0.49-0.65)	0.69 (0.60-0.79)	0.75 (0.65-0.87)
21 months (6 qtrs)	0.61 (0.54-0.70)	0.75 (0.66-0.85)	0.81 (0.71-0.92)
24 months (7 qtrs)	0.61 (0.54-0.69)	0.75 (0.66-0.84)	0.81 (0.72-0.92)

Footnote:

Cox Adjustment 1: Adjusted for IPTW predictors only: age, gender, DM, race

Cox Adjustment2: Fully adjusted model: adjusted for IRTW predictors and additional confounders: marital status, employment, baseline co-morbidities (COPD, cancer, hypertension, ability to ambulate, heart failure, and atherosclerotic heart disease), and baseline serum levels of ferritin, calcium, phosphorus, and nPCR)

\*Months show time from dialysis initiation while quarters count starts from the quarter when patient reaches day 90 of dialysis treatment;

\*\*All p values were less than 0.05

**Table 3.S.** Death hazard ratios (HR) for dialysis modality (PD vs. HD) in 23,718 incident dialysis patients using MSM taking into account changes in dialysis modality and transplant censorship in the first 2 years (see also [Figure 4](#))

Survival period	Death hazard ratios (HR) using MSM		
	MSM Adjustment 1	MSM Adjustment 2	MSM Adjustment 3
<b><u>Model 1</u></b>			
9 months (2 qtrs)*	0.40 (0.31-0.51)	0.51 (0.40-0.65)	0.58 (0.45-0.75)
12 months (3 qtrs)	0.49 (0.40-0.61)	0.63 (0.51-0.78)	0.72 (0.58-0.90)
15 months (4 qtrs)	0.42 (0.30-0.58)	0.54 (0.38-0.77)	0.64 (0.48-0.87)
18 months (5 qtrs)	0.38 (0.26-0.56)	0.46 (0.30-0.72)	0.53 (0.36-0.80)
21 months (6 qtrs)	0.38 (0.24-0.60)	0.44 (0.26-0.75)	0.50 (0.31-0.80)
24 months (7 qtrs)	0.25 (0.14-0.47)	0.34 (0.20-0.59)	0.41 (0.21-0.68)
<b><u>Model 2</u></b>			
9 months (2 qtrs)	0.39 (0.30-0.49)	0.48 (0.39-0.61)	0.56 (0.44-0.71)
12 months (3 qtrs)	0.46 (0.38-0.57)	0.59 (0.48-0.72)	0.68 (0.56-0.84)
15 months (4 qtrs)	0.40 (0.30-0.54)	0.50 (0.36-0.70)	0.61 (0.46-0.81)
18 months (5 qtrs)	0.35 (0.25-0.50)	0.42 (0.27-0.64)	0.50 (0.35-0.73)
21 months (6 qtrs)	0.35 (0.24-0.52)	0.40 (0.24-0.66)	0.48 (0.31-0.75)
24 months (7 qtrs)	0.23 (0.11-0.45)	0.32 (0.18-0.55)	0.40 (0.25-0.64)
<b><u>Model 3</u></b>			
9 months (2 qtrs)	0.35 (0.26-0.37)	0.42 (0.30-0.56)	0.44 (0.32-0.61)
12 months (3 qtrs)	0.43 (0.33-0.57)	0.54 (0.40-0.71)	0.59 (0.44-0.78)
15 months (4 qtrs)	0.39 (0.29-0.52)	0.50 (0.38-0.67)	0.55 (0.45-0.74)
18 months (5 qtrs)	0.43 (0.30-0.61)	0.57 (0.40-0.82)	0.61 (0.43-0.86)
21 months (6 qtrs)	0.45 (0.30-0.68)	0.60 (0.40-0.90)	0.61 (0.42-0.89)
24 months (7 qtrs)	0.37 (0.21-0.64)	0.53 (0.33-0.84)	0.52 (0.34-0.80)

Footnote

MSM Adjustment 1: IPW adjusted; IPWs were calculated using different sets of variables:

Model 1: IPW: age, baseline modality; time dependent modality (TD); (stabilized IPW mean=1.06)

Model 2: IPW: age, sex, race, DM baseline modality; time dependent modality; (stabilized IPW mean=1.06)

Model 3: IPW: age, sex, race, DM baseline modality, Alb, Hgb; TD modality, Alb, Hgb; (stabilized IPW mean=1.29)

MSM Adjustment 2: IPW + adding the same variables used to calculate IPWs to control for residual confounding

MSM Adjustment 3: Same as Adjustment2 + additional confounders: marital status, employment, baseline co-morbidities (COPD, cancer, hypertension, ability to ambulate heart failure, and atherosclerotic heart disease), and baseline serum levels of ferritin, calcium, phosphorus, and nPCR)

**Table 4.S.** Death hazard ratios (HR) for dialysis modality (PD vs. HD) in 23,718 incident dialysis patients using MSM taking into account changes in dialysis modality and transplant censorship in the first 2 years stratifying on diabetes status and age (see also [Figure 5](#))

Survival period	Death hazard ratios (HR) using MSM		
	MSM Adjustment 1	MSM Adjustment 2	MSM Adjustment 3
<b>With Diabetes, N=14,539</b> (mean for stabilized IPWs= 1.07)			
9 months (2 qtrs)	0.48 (0.36-0.65)	0.56 (0.42-0.76)	0.62 (0.48-0.84)
12 months (3 qtrs)	0.61 (0.47-0.79)	0.73 (0.57-0.94)	0.81 (0.63-1.05)
15 months (4 qtrs)	0.47 (0.33-0.66)	0.55 (0.37-0.83)	0.66 (0.47-0.92)
18 months (5 qtrs)	0.37 (0.24-0.58)	0.38 (0.21-0.58)	0.46 (0.26-0.77)
21 months (6 qtrs)	0.37 (0.22-0.61)	0.34(0.17-0.70)	0.43 (0.24-0.79)
24 months (7 qtrs)	0.26 (0.14-0.47)	0.27 (0.13-0.54)	0.34 (0.18-0.63)
<b>Without Diabetes, N=9,179</b> (mean for stabilized IPW= 0.97)			
9 months (2 qtrs)	0.29 (0.20-0.43)	0.39 (0.26-0.58)	0.49 (0.33-0.72)
12 months (3 qtrs)	0.31 (0.21-0.43)	0.42 (0.29-0.60)	0.51 (0.36-0.74)
15 months (4 qtrs)	0.38 (0.27-0.54)	0.50 (0.35-0.73)	0.60 (0.41-0.88)
18 months (5 qtrs)	0.38 (0.28-0.52)	0.52 (0.37-0.72)	0.60 (0.43-0.85)
21 months (6 qtrs)	0.39 (0.29-0.51)	0.52 (0.39-0.71)	0.62 (0.45-0.84)
24 months (7qtrs)	0.38 (0.29-0.51)	0.54 (0.40-0.72)	0.64 (0.47-0.87)
<b>Age &lt;=65 years, N=12,257</b> (mean for stabilized IPW=1.02)			
9 months (2 qtrs)	0.46 (0.32-0.67)	0.46 (0.32-0.67)	0.58 (0.43-0.78)
12 months (3 qtrs)	0.55 (0.44-0.74)	0.56 (0.41-0.76)	0.67 (0.50-0.92)
15 months (4 qtrs)	0.50 (0.36-0.68)	0.52 (0.39-0.69)	0.63 (0.48-0.83)
18 months (5 qtrs)	0.50 (0.38-0.67)	0.51 (0.38-0.68)	0.62 (0.48-0.63)
21 months (6 qtrs)	0.52 (0.39-0.68)	0.52 (0.39-0.70)	0.69 (0.49-0.84)
24 months (7 qtrs)	0.40 (0.23-0.68)	0.45 (0.31-0.65)	0.58(0.43-0.79)
<b>Age &gt; 65years, N=11,445</b> (mean for stabilized IPWs=1.07)			
9 months (2 qtrs)	0.43 (0.35-0.69)	0.47 (0.34-0.64)	0.54 (0.39-0.73)
12 months (3 qtrs)	0.55 (0.31-0.74)	0.60 (0.43-0.81)	0.68 (0.51-0.92)
15 months (4 qtrs)	0.42 (0.22-0.80)	0.48 (0.27-0.65)	0.59 (0.37-0.94)
18 months (5 qtrs)	0.29 (0.13-0.63)	0.33 (0.16-0.68)	0.39 (0.20-0.75)
21 months (6 qtrs)	0.26 (0.11-0.62)	0.29 (0.12-0.68)	0.34 (0.15-0.75)
24 months (7 qtrs)	0.20 (0.08-0.50)	0.23 (0.09-0.55)	0.27 (0.12-0.61)

**Footnote:**

\*Months show time from dialysis initiation while quarters count starts from the quarter when patient reaches day 90 of dialysis treatment;

\*\* All p values were less than 0.05

Model 2 (age, sex, race, DM baseline modality; time dependent modality) MSM Adjustments 1-3 are the same as for Table 3.S.

**Table 5.S.** Causal death hazard ratio (HR) for the association between dialysis modality and mortality during the first 2 years of dialysis therapy in incident dialysis patients using different weights for MSM (all estimates were calculated using MSM model 2, see text)

Survival Period	HR using IPW (Model 2)	HR using IPTW	HR using IPCW	HR using Cox (Adjustment 2)
9 months (2qtrs)	0.56 (0.44-0.71)	0.57 (0.47-0.72)	0.59 (0.46-0.74)	0.58 (0.48-0.73)
12 months (3qtrs)	0.68 (0.56-0.84)	0.72 (0.58-0.89)	0.67 (0.55-0.80)	0.62 (0.51-0.75)
15 months (4qtrs)	0.61 (0.46-0.81)	0.64 (0.59-0.75)	0.71 (0.61-0.84)	0.70 (0.59-0.82)
18 months (5qtrs)	0.50 (0.35-0.73)	0.52 (0.36-0.76)	0.75 (0.65-0.86)	0.75 (0.65-0.87)
21 months (6qtrs)	0.48 (0.31-0.75)	0.50 (0.32-0.78)	0.82 (0.73-0.93)	0.81 (0.71-0.92)
24 months (7 qtrs)	0.40 (0.25-0.64)	0.41 (0.25-0.67)	0.81 (0.72-0.91)	0.81 (0.72-0.92)

**Footnote:**

Model 2: IPW: age, sex, race, DM baseline modality; time dependent modality; (stabilized IPW mean=1.06)

Cox Adjustment2: Fully adjusted model: adjusted for IRTW predictors and additional confounders: marital status, employment, baseline co-morbidities (COPD, cancer, hypertension, ability to ambulate, ambulate heart failure, and atherosclerotic heart disease), and baseline serum levels of ferritin, calcium, phosphorus, and nPCR)

IPTW= Inverse Probability of Treatment Weights

IPCW= Inverse Probability of Censorship Weights