

Appendix to
A Comparison of US Medicare Expenditures for Hemodialysis and Peritoneal Dialysis

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eExhibit1. Codes used to identify dialysis access

Inpatient dialysis access

DRG

112, 120, 315, 442, 443, 478, 479 prior to October 1, 2007;
252, 264, 673, 674, 675, 907, 908, 909 after September 30, 2007

ICD-9 diagnosis code

996.1, 996.56, 996.62, 996.68, 996.73, 999.31, V56.1, V56.2

ICD-9 procedure code

38.95, 39.27, 39.42, 39.43, 39.93, 39.94

Outpatient dialysis access

HCPCS codes

01844, 36145, 36147, 36148, 36593, 36800, 36810, 36815, 36818, 36819, 36820, 36821, 36825, 36830, 36831, 36832, 36833, 36835, 36838, 36860, 36861, 36870, 37238, 37239, 37607, 49419, 49420, 49421, 49422, 75790, 75791, 90939, 90940, G0159, G0392, G0393, M0900

HCPCS codes needing a confirmatory diagnosis

00532, 01784, 34101, 35190, 35321, 35458, 35460, 35475, 35476, 35484, 35875, 35876, 35900, 35903, 35910, 36005, 36011, 36488, 36489, 36490, 36491, 36533, 36534, 36535, 36550, 36555, 36556, 36557, 36558, 36565, 36575, 36580, 36581, 36584, 36589, 36596, 36597, 36834, 37190, 37201, 37205, 37206, 37207, 37208, 75820, 75860, 75896, 75960, 75962, 75978, 75998, 76937, 77001

ICD-9 diagnosis codes whose presence confirms that certain HCPCS codes are dialysis-related

250.xx; 403.xx; 580.xx-589.xx; 593.xx; 996.1x; 996.62; 996.73; V56.xx

ICD-9 diagnosis codes

540.0x; 540.1x; 567.xx, 614.5; 614.6, 996.1x; 996.62; 996.56; 996.73; 996.68; 999.31; V56.1; V56.2

ICD-9 procedure codes

38.95, 39.27, 39.42, 39.43, 39.93, 39.94

*reference: USRDS annual data report, Volume 2: ESRD Analytical Methods

https://www.usrds.org/media/1739/v2_c13_esrdmethods_18_usrds.pdf

- vol 2 Table 13.8 Diagnosis and procedure codes used for vascular access

- Vol 2 Table 13.15 DRG and ICD-9-CM procedure and diagnosis codes for vascular access and peritoneal dialysis access hospitalization

eExhibit 2. Analysis of Medicare Part D expenditures

When analyzing Medicare Part D expenditures, our focus was on measuring the amount paid by Medicare for outpatient prescription drugs. On and after 2013, the data available from the United States Renal Data System (USRDS) database enabled us to generate this number from the following 2 data fields:

- 1) Covered Part D plan paid amount – “CVRD_D_PLAN_PD_AMT”
- 2) Low-income cost sharing subsidy amount. – “LICS_AMT”

Where, Medicare Part D drug payments (Method A) equals the sum of #1 and #2 above.

However, these data fields were not available in Medicare Part D data available to us through the USRDS database in the years prior to 2013. The best approximation of the amount Medicare paid for prescription drugs in these earlier years (2008-2012) could be derived from the following data fields:

- 3) Gross drug cost – “TOT_RX_CST_AMT”
- 4) Patient payment amount – “PTNT_PAY_AMT”

Where, approximate Medicare Part D drug payments (Method B) equals #3 minus #4.

The data fields used in Method B to approximate Part D expenditures in 2008-2012 were also available in the latter years (2013-2017), which enabled us to compare the 2 methods of deriving Medicare payment amount between 2013 and 2017. The following table illustrates the mean and distribution of payment amounts for claims using the 2 methods in patients between 2013 and 2017, stratified by dialysis modality:

Modality	N of claims	Variable	Mean	25th percentile	50th percentile	75th percentile
Peritoneal dialysis	771,516	Method A: (Covered Part D plan amount) + (LIS amount)	92.86	2.56	8.16	29.27
		Method B: (Gross drug cost) – (Patient pay amount)	116.26	1.79	8.27	39.78
		Difference: (Method B) – (Method A)	23.40	-0.00	0.00	0.00
Hemodialysis	8,795,652	Method A: (Covered Part D plan amount) + (LIS amount)	95.99	4.00	10.64	40.97
		Method B: (Gross drug cost) – (Patient pay amount)	109.56	3.60	10.86	49.49
		Difference: (Method B) – (Method A)	13.57	0.00	0.00	0.00

Note: LIS is low income subsidy

In the above table, we see that payment amounts are similar using the 2 methods. The correlation coefficient was 0.9392. They were more similar among patients with the low-income subsidy. To the extent that they differed, it did not appear to be related to dialysis modality.

We then used these 2 data fields in 2013-2017 to develop a prediction model. The model included all patients who were eligible to be matched during this period (including those who were and were not selected to be in the matched cohort). The variable being predicted is the actual Medicare payment #1 + #2. The variables used to predict actual payment included estimated payments (#3-#4), all patient, geographic, and dialysis facility characteristics that were included in the propensity score model (listed in Table 1), an indicator of eligibility for the low-income subsidy, and an indicator of whether the patient initiated hemodialysis or peritoneal dialysis. Calendar year of dialysis initiation was included in the model as a linear covariate.

The following table illustrates the mean and distributions of observed and predicted Medicare Part D payment amounts, along with the residuals, using the model described above in 2013-2017.

Modality	N of claims	Variable	Mean	25th percentile	50th percentile	75th percentile
Peritoneal dialysis	771,516	Medicare Part D Payment Amount: observed	92.86	2.56	8.16	29.27
		Medicare Part D Payment Amount: predicted	92.86	-3.07	4.49	30.00
		Residual in predicted model	-0.00	0.43	4.95	11.42
Hemodialysis	8,795,652	(Covered Part D plan amount) + (LIS amount)	95.99	4.00	10.64	40.97
		(Gross drug cost) – (Patient pay amount)	95.99	1.42	8.95	43.74
		(Method B) – (Method A)	-0.00	-0.02	0.63	7.25

As the table illustrates, the mean difference between observed and predicted was 0. The difference remained relatively small in patients receiving both peritoneal and hemodialysis. The first 75th percentile of residuals were within 12.5% of the mean Medicare payment amount for peritoneal dialysis, within 7.5% of the mean Medicare payment amount for hemodialysis.

eExhibit 3. Analysis of PD use over time.

We used the first 60 days of end-stage kidney disease (ESKD) to ascertain whether or not a patient tries using peritoneal dialysis (PD). Our objective was to select a time period that would reflect PD use decisions made close to the start of dialysis. In particular, we wanted to give patients who were unprepared for the start of dialysis enough time to have received education about different dialysis modalities and, if they want to receive PD, to have a PD catheter placed and accessed. Choosing a longer time period (e.g. 90 or 180 days) to ascertain dialysis modality would possibly capture more patients. However, results could increasingly become biased with longer ascertainment periods since decisions made later in the course of a patient’s dialysis therapy may reflect experiences and complications associated with initial attempts to use in-center hemodialysis. In order to further examine the decision to assign patients according to the modalities used in the first 60 days of dialysis, we first identified all patients who used PD at some point in the first year of dialysis. We then plotted the proportion who had done so at 0, 30, 60, 90, 180, and 365 days. These findings, along with the actual proportion of patients receiving PD at each time period, are plotted in eFigure 1. It is reassuring that, among the subset of patients who use PD at some point in their first year of dialysis, 73% have already tried this modality by their 60th day of dialysis.

Supplemental Table1. Reasons for lost to follow-up of the matched hemodialysis and PD pairs

Reason for forced ending of follow-up of matched pair	N (%) pairs	Reason for ending follow-up of the first patient who lost follow-up in a matched pair						
		Kidney transplantation	death	Loss of Medicare Part A&B coverage	Loss of Medicare Part D coverage	Kidney function recovery	Lost follow-up	Discontinued dialysis
Forced ending of follow-up of a pair at the end of the 3 rd follow-up year	1384 (16.7)	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Forced ending of follow-up of a pair when the first patient lost to follow-up								
Hemodialysis first	3375 (40.6)	205 (2.5)	1918 (23.1)	201 (2.4)	346 (4.2)	184 (2.2)	23 (0.3)	498 (6.0)
PD first	3535 (42.6)	273 (3.3)	2167 (26.1)	164 (2.0)	355 (4.3)	120 (1.4)	21 (0.3)	435 (5.2)
Forced ending of follow-up of a pair on the date when both HD and PD patients lost to follow-up	11 (0.1)*	n/a	n/a	n/a	n/a	n/a	n/a	n/a

*Among the 11 pairs ending follow-up on the date when both patients lost to follow-up, both hemodialysis and PD patients died in 5 pairs, both patients lost Medicare Part D coverage in 4 pairs, hemodialysis patient lost Medicare Part D coverage and PD patient lost Medicare Part A&B coverage in 1 pair, hemodialysis patient discontinued dialysis and PD patient died in 1 pair.

Supplemental Table 2. Modality and annual Medicare payments

	Log normal regression		Linear regression	
	Payment ratio (95% CI) * HD / PD	P-value	Payment difference (95% CI) * HD – PD, 2017 USD	P-value
Annual total payment				
Modality, HD vs. PD	1.11 (1.09, 1.13)	<.001	10936.31 (8823.00, 13049.63)	<.001
Hemoglobin, g/dL	0.98 (0.98, 0.99)	<.001	-1470.05 (-2234.63, -705.47)	<.001
Album, g/dL	0.86 (0.85, 0.88)	<.001	-14788.5 (-16790.0, -12787.1)	<.001
BMI, kg/m ²	1.0024 (1.0008, 1.0041)	0.004	234.47 (63.55, 405.40)	0.007
Pre-ESKD payment in 12m, 2017 USD	1.0000 (1.0000, 1.0000)	<.001	0.34 (0.30, 0.37)	<.001
Annual total payment excluding Part D oral drug payment				
Modality, HD vs. PD	1.12 (1.10, 1.14)	<.001	11248.79 (9151.45, 13346.12)	<.001
Hemoglobin, g/dL	0.99 (0.98, 0.99)	<.001	-1230.23 (-1988.74, -471.72)	0.002
Album, g/dL	0.86 (0.84, 0.87)	<.001	-14701.9 (-16698.9, -12704.8)	<.001
BMI, kg/m ²	1.0019 (1.0002, 1.0036)	0.033	171.20 (0.75, 341.65)	0.050
Pre-ESKD payment in 12m, 2017 USD	1.0000 (1.0000, 1.0000)	<.001	0.33 (0.29, 0.36)	<.001
Annual total dialysis payment#				
Modality, HD vs. PD	1.01 (1.00, 1.02)	0.078	242.57 (-28.59, 513.73)	0.080
Hemoglobin, g/dL	0.99 (0.98, 0.99)	<.001	-466.20 (-567.72, -364.68)	<.001
Album, g/dL	1.02 (1.01, 1.03)	<.001	691.85 (402.61, 981.10)	<.001
BMI, kg/m ²	1.0045 (1.0039, 1.0051)	<.001	153.78 (133.15, 174.40)	<.001
Pre-ESKD payment in 12m, 2017 USD	1.0000 (1.0000, 1.0000)	0.815	0.00 (0.00, 0.01)	0.066
Annual iv dialysis drug payment				
Modality, HD vs. PD	1.69 (1.64, 1.73)	<.001	2777.47 (2628.11, 2926.83)	<.001
Hemoglobin, g/dL	0.86 (0.85, 0.87)	<.001	-710.37 (-757.98, -662.75)	<.001
Album, g/dL	0.91 (0.88, 0.95)	<.001	-468.94 (-690.83, -247.04)	<.001
BMI, kg/m ²	1.0070 (1.0050, 1.0091)	<.001	41.39 (30.03, 52.75)	<.001
Pre-ESKD payment in 12m, 2017 USD	1.0000 (1.0000, 1.0000)	<.001	0.01 (0.01, 0.01)	<.001
Annual other dialysis payment‡				
Modality, HD vs. PD	0.91 (0.91, 0.92)	<.001	-2534.91 (-2814.03, -2255.78)	<.001
Hemoglobin, g/dL	1.01 (1.01, 1.01)	<.001	244.17 (139.73, 348.61)	<.001
Album, g/dL	1.04 (1.03, 1.05)	<.001	1160.79 (836.30, 1485.28)	<.001
BMI, kg/m ²	1.0040 (1.0033, 1.0047)	<.001	112.38 (91.24, 133.53)	<.001
Pre-ESKD payment in 12m, 2017 USD	1.0000 (1.0000, 1.0000)	<.001	-0.01 (-0.01, -0.01)	<.001
Annual acute care payment				
Modality, HD vs. PD	1.04 (0.99, 1.09)	0.109	1679.93 (73.92, 3285.93)	0.040
Hemoglobin, g/dL	0.98 (0.96, 1.00)	0.011	-646.41 (-1198.18, -94.64)	0.022
Album, g/dL	0.78 (0.75, 0.81)	<.001	-8399.41 (-9904.61, -6894.21)	<.001
BMI, kg/m ²	0.9986 (0.9949, 1.0023)	0.451	-61.88 (-192.78, 69.03)	0.354
Pre-ESKD payment in 12m, 2017 USD	1.0000 (1.0000, 1.0000)	<.001	0.18 (0.15, 0.21)	<.001
Annual rehabilitation payment				
Modality, HD vs. PD	1.35 (1.26, 1.45)	<.001	3533.81 (2843.51, 4224.11)	<.001
Hemoglobin, g/dL	0.98 (0.95, 1.00)	0.088	-128.09 (-402.68, 146.51)	0.360
Album, g/dL	0.65 (0.60, 0.69)	<.001	-4984.19 (-5719.76, -4248.63)	<.001
BMI, kg/m ²	1.0024 (0.9973, 1.0076)	0.350	33.03 (-21.81, 87.87)	0.238
Pre-ESKD payment in 12m, 2017 USD	1.0000 (1.0000, 1.0000)	<.001	0.07 (0.06, 0.08)	<.001

Annual other non-dialysis payment[§]				
Modality, HD vs. PD	1.34 (1.30, 1.37)	<.001	5480.01 (4971.03, 5989.00)	<.001
Hemoglobin, g/dL	0.99 (0.98, 1.00)	0.053	-229.36 (-430.24, -28.47)	0.026
Album, g/dL	0.89 (0.87, 0.92)	<.001	-2096.78 (-2707.88, -1485.68)	<.001
BMI, kg/m ²	1.0059 (1.0041, 1.0078)	<.001	109.55 (70.42, 148.67)	<.001
Pre-ESKD payment in 12m, 2017 USD	1.0000 (1.0000, 1.0000)	<.001	0.08 (0.07, 0.09)	<.001
Annual dialysis access payment[†]				
Modality, HD vs. PD	1.12 (1.00, 1.25)	0.048	2942.67 (153.16, 5732.18)	0.039
Hemoglobin, g/dL	0.94 (0.91, 0.98)	0.003	-1715.55 (-2882.35, -548.74)	0.004
Album, g/dL	0.82 (0.71, 0.94)	0.008	-4001.68 (-7843.26, -160.10)	0.043
BMI, kg/m ²	1.0006 (0.9929, 1.0082)	0.888	23.42 (-178.80, 225.64)	0.820
Pre-ESKD payment in 12m, 2017 USD	1.0000 (1.0000, 1.0000)	<.001	0.10 (0.05, 0.15)	<.001

*Adjusting for hemoglobin, album, BMI, pre-ESKD annual payment

[#]Includes payment for iv dialysis drug and other dialysis

[‡]Includes payment for the dialysis procedure, oral dialysis drugs, additional treatments and add-ons, and clinician care in outpatient dialysis.

[§]Includes payment for non-dialysis Medicare expenditures, including Parts A, B and D.

[†]Excludes strata with outlier payment amounts.

HD: hemodialysis; PD: peritoneal dialysis; BMI: body mass index; CI: confidence interval; ESKD: end stage kidney disease; iv: intravenous; USD: US dollar

Supplemental Table 3. Annual Medicare payment difference between modality, linear trend over time

	Log normal regression*		Linear regression*	
	Change in payment ratio per calendar year (95% CI)*	P-value	Change in payment difference per calendar year (95% CI)*	P-value
	HD / PD		HD – PD, 2017 USD	
Annual total payment	0.99 (0.98, 1.00)	0.145	-761.81 (-1948.87, 425.26)	0.209
Annual total dialysis payment [#]	0.97 (0.97, 0.97)	<.001	-859.02 (-993.64, -724.40)	<.001
Annual iv dialysis drug payment	0.98 (0.96, 0.99)	<.001	-363.82 (-440.16, -287.47)	<.001
Annual other dialysis payment [‡]	0.99 (0.98, 0.99)	<.001	-495.20 (-619.66, -370.75)	<.001
Annual acute care payment	1.00 (0.97, 1.02)	0.891	-168.04 (-1087.53, 751.45)	0.720
Annual rehabilitation payment	1.00 (0.96, 1.04)	0.952	55.47 (-315.39, 426.33)	0.770
Annual other non-dialysis payment [§]	1.01 (1.00, 1.02)	0.120	209.79 (-62.64, 482.22)	0.131
Annual dialysis access payment [†]	1.00 (0.95, 1.05)	0.914	235.96 (-1007.10, 1479.02)	0.710

*From the interaction term between modality and calendar year of dialysis initiation in a model adjusting for hemoglobin, album, BMI, pre-ESKD annual payment

[#]Includes payment for iv dialysis drug and other dialysis

[‡]Includes payment for the dialysis procedure, oral dialysis drugs, additional treatments and add-ons, and clinician care in outpatient dialysis.

[§]Includes payment for non-dialysis Medicare expenditures, including Parts A, B and D.

[†]Excludes strata with outlier payment amounts.

HD: hemodialysis; PD: peritoneal dialysis; BMI: body mass index; CI: confidence interval; ESKD: end stage kidney disease; iv: intravenous; USD: US dollar

Supplemental Table 4. Modality and annual Medicare payments, interaction between modality and follow-up year

Modality, HD vs. PD by follow-up year	Log normal regression*		Linear regression*	
	Payment ratio (95% CI) HD / PD	P-value	Payment difference (95% CI) HD – PD, 2017 USD	P-value
Annual total payment				
Year 1	1.18 (1.15, 1.20)	<.001	16489.01 (14308.40, 18669.60)	<.001
Year 2	0.93 (0.87, 0.98)	0.008	-7310.94 (-12795.10, -1826.80)	0.009
Year 3	0.89 (0.84, 0.95)	<.001	-10636.90 (-16745.70, -4528.10)	<.001

*Adjusting for hemoglobin, album, body mass index (BMI), pre-ESKD annual payment

P-value for linear trend in follow-up year was <0.001.

CI: confidence interval; iv: intravenous

[†]Excludes strata with outlier payment amounts.

Supplemental Table 5. Baseline characteristics before and after propensity-score matching, limiting to patients as-assigned on day 60 after matching

	Before matching			After matching		
	PD (N=8,305)	In-center hemodialysis (N=105,747)	Standardized mean difference	PD (N=7,395)	In-center hemodialysis (N=7,395)	Standardized mean difference
Baseline characteristics						
Age	75.1 (6.0)	76.4 (6.5)	0.214	75.1 (6.0)	75.1 (6.0)	0.006
Female	3690 (44.4)	54771 (51.8)	0.148	3283 (44.4)	3294 (44.5)	0.003
Race						
White	6882 (82.9)	77879 (73.6)	0.225	6104 (82.5)	6063 (82.0)	0.015
Black	874 (10.5)	21868 (20.7)	0.283	791 (10.7)	832 (11.3)	0.018
Asian	450 (5.4)	4371 (4.1)	0.06	411 (5.6)	416 (5.6)	0.003
Other	99 (1.2)	1629 (1.5)	0.03	89 (1.2)	84 (1.1)	0.006
Hispanic	562 (6.8)	11454 (10.8)	0.144	499 (6.7)	456 (6.2)	0.024
Pre-ESKD hospitalization						
Once or multiple times within 30 days	2620 (31.5)	39305 (37.2)	0.119	2287 (30.9)	2350 (31.8)	0.018
At least two times 30 days apart	1746 (21.0)	40594 (38.4)	0.387	1502 (20.3)	1527 (20.6)	0.008
Pre-ESKD nephrologist visit						
Once or multiple times within 30 days	623 (7.5)	13906 (13.2)	0.186	533 (7.2)	503 (6.8)	0.016
At least two times 30 days apart	6769 (81.5)	62326 (58.9)	0.509	6060 (81.9)	6045 (81.7)	0.005
Medicaid	1214 (14.6)	32900 (31.1)	0.401	1061 (14.3)	1096 (14.8)	0.013
RUCA						
Metropolitan	6039 (72.7)	81599 (77.2)	0.103	5408 (73.1)	5352 (72.4)	0.017
Micropolitan	1070 (12.9)	12879 (12.2)	0.021	947 (12.8)	959 (13.0)	0.005
Small town	704 (8.5)	7161 (6.8)	0.064	616 (8.3)	656 (8.9)	0.019
Rural area	492 (5.9)	4108 (3.9)	0.095	424 (5.7)	428 (5.8)	0.002
Low income subsidy enrollment	2009 (24.2)	49475 (46.8)	0.486	1771 (23.9)	1771 (23.9)	0
Congestive heart failure	3895 (46.9)	73442 (69.5)	0.47	3384 (45.8)	3352 (45.3)	0.009
Valvular disease	1983 (23.9)	35895 (33.9)	0.223	1727 (23.4)	1739 (23.5)	0.004

Pulmonary circulation disease	833 (10.0)	19244 (18.2)	0.236	713 (9.6)	744 (10.1)	0.014
Peripheral vascular disease	2535 (30.5)	45136 (42.7)	0.254	2220 (30.0)	2195 (29.7)	0.007
Paralysis	171 (2.1)	6597 (6.2)	0.211	145 (2.0)	155 (2.1)	0.01
Other neurological disorder	830 (10.0)	23670 (22.4)	0.341	720 (9.7)	723 (9.8)	0.001
Chronic pulmonary disease	2274 (27.4)	43746 (41.4)	0.298	1948 (26.3)	1980 (26.8)	0.01
Diabetes with or without complex	5053 (60.8)	74805 (70.7)	0.21	4503 (60.9)	4434 (60.0)	0.019
Hypothyroidism	1820 (21.9)	25532 (24.1)	0.053	1620 (21.9)	1618 (21.9)	0.001
Liver disease	245 (3.0)	5147 (4.9)	0.099	208 (2.8)	200 (2.7)	0.007
Peptic ulcer disease with bleeding	16 (0.2)	413 (0.4)	0.037	10 (0.1)	14 (0.2)	0.013
AIDS	18 (0.2)	311 (0.3)	0.015	16 (0.2)	13 (0.2)	0.009
Lymphoma, metastatic cancer, solid tumor w/o metastasis	1540 (18.5)	21518 (20.3)	0.046	1371 (18.5)	1387 (18.8)	0.006
Rheumatoid arthritis/collagen vascular disease	386 (4.6)	5794 (5.5)	0.038	347 (4.7)	345 (4.7)	0.001
Coagulopathy	731 (8.8)	17303 (16.4)	0.229	628 (8.5)	620 (8.4)	0.004
Obesity	1080 (13.0)	21366 (20.2)	0.194	936 (12.7)	953 (12.9)	0.007
Weight loss	598 (7.2)	17192 (16.3)	0.284	507 (6.9)	509 (6.9)	0.001
Fluid and electrolyte disorder	4567 (55.0)	76691 (72.5)	0.371	3975 (53.8)	3903 (52.8)	0.02
Chronic blood loss anemia	379 (4.6)	8477 (8.0)	0.143	331 (4.5)	292 (3.9)	0.026
Deficiency anemia	7261 (87.4)	94869 (89.7)	0.072	6445 (87.2)	6457 (87.3)	0.005
Alcohol abuse	83 (1.0)	2316 (2.2)	0.095	68 (0.9)	71 (1.0)	0.004
drug abuse	30 (0.4)	1005 (1.0)	0.073	20 (0.3)	28 (0.4)	0.019
Psychoses	348 (4.2)	9962 (9.4)	0.209	308 (4.2)	315 (4.3)	0.005
Depression	738 (8.9)	16249 (15.4)	0.199	635 (8.6)	636 (8.6)	0.0005
Coronary artery disease	4521 (54.4)	68866 (65.1)	0.219	4006 (54.2)	3942 (53.3)	0.017
Cerebral vascular disease	1786 (21.5)	33049 (31.3)	0.223	1551 (21.0)	1478 (20.0)	0.024

Characteristics not in propensity score model

BMI, kg/m ²	n/a	n/a	n/a	28.1 (6.1)	28.2 (6.7)	0.017
N missing				68	56	
Hemoglobin, g/dL	n/a	n/a	n/a	10.3 (1.5)	9.8 (1.5)	0.327
N missing				1053	936	

Album, g/dL	n/a	n/a	n/a	3.6 (0.6)	3.3 (0.6)	0.443
N missing				1957	2011	
Pre-ESRD annual payment	n/a	n/a	n/a	40329.5 (45446.2)	45396.3 (53108.3)	0.103

Data are from the United States Renal Data System (USRDS) dialysis registry.

* Propensity score model: Logistic model was fit among patients with and without low income subsidy separately to get predicted probability of receiving PD. Covariates included in the model were age, age square, sex, race, ethnicity, Medicaid, RUCA category, pre-ESRD hospitalization, pre-ESRD nephrologist visit, individual comorbidities based on Felix comorbidity score, calendar year and season.

* Propensity-score matching: One hemodialysis patient with most close propensity score was selected and matched to a PD patient of the same low-income subsidy status and the same calendar year/season of dialysis initiation using greedy match.

RUCA: Rural-urban commuting area.

Supplemental Table 6. Modality and annual Medicare payments, limiting to patients as-assigned on day 60

	Log normal regression		Linear regression	
	Payment ratio (95% CI)* HD / PD	P- value	Payment difference (95% CI)* HD – PD, 2017 USD	P- value
Annual total payment				
Modality, HD vs. PD	1.20 (1.17, 1.23)	<.001	18885.06 (16388.05, 21382.07)	<.001
Hemoglobin, g/dL	0.98 (0.97, 0.99)	<.001	-1961.68 (-2904.24, -1019.12)	<.001
Album, g/dL	0.86 (0.84, 0.88)	<.001	-15308.3 (-17862.5, -12754.2)	<.001
BMI, kg/m ²	1.0014 (0.9996, 1.0033)	0.124	116.78 (-77.24, 310.80)	0.238
Pre-ESKD payment in 12m, 2017 USD	1.0000 (1.0000, 1.0000)	<.001	0.35 (0.31, 0.39)	<.001
Annual total payment excluding Part D oral drug payment				
Modality, HD vs. PD	1.22 (1.19, 1.25)	<.001	19181.13 (16699.99, 21662.27)	<.001
Hemoglobin, g/dL	0.98 (0.97, 0.99)	<.001	-1705.01 (-2624.58, -785.43)	<.001
Album, g/dL	0.86 (0.84, 0.88)	<.001	-15223.0 (-17754.8, -12691.3)	<.001
BMI, kg/m ²	1.0009 (0.9990, 1.0028)	0.364	58.64 (-135.24, 252.53)	0.544
Pre-ESKD payment in 12m, 2017 USD	1.0000 (1.0000, 1.0000)	<.001	0.33 (0.29, 0.37)	<.001
Annual total dialysis payment[#]				
Modality, HD vs. PD	1.05 (1.04, 1.06)	<.001	1744.46 (1388.64, 2100.29)	<.001
Hemoglobin, g/dL	0.98 (0.98, 0.99)	<.001	-592.27 (-714.30, -470.24)	<.001
Album, g/dL	1.03 (1.02, 1.04)	<.001	1060.66 (631.94, 1489.39)	<.001
BMI, kg/m ²	1.0043 (1.0036, 1.0050)	<.001	155.02 (128.37, 181.68)	<.001
Pre-ESKD payment in 12m, 2017 USD	1.0000 (1.0000, 1.0000)	0.007	0.00 (-0.01, 0.00)	0.013
Annual iv dialysis drug payment				
Modality, HD vs. PD	2.18 (2.11, 2.24)	<.001	4110.86 (3956.02, 4265.70)	<.001
Hemoglobin, g/dL	0.83 (0.83, 0.84)	<.001	-815.62 (-870.48, -760.76)	<.001
Album, g/dL	0.93 (0.90, 0.95)	<.001	-393.66 (-537.24, -250.09)	<.001
BMI, kg/m ²	1.0052 (1.0030, 1.0073)	<.001	34.40 (21.82, 46.97)	<.001
Pre-ESKD payment in 12m, 2017 USD	1.0000 (1.0000, 1.0000)	<.001	0.01 (0.01, 0.01)	<.001
Annual other dialysis payment [‡]				
Modality, HD vs. PD	0.93 (0.91, 0.94)	<.001	-2366.40 (-2718.04, -2014.75)	<.001
Hemoglobin, g/dL	1.01 (1.00, 1.01)	<.001	223.35 (100.08, 346.62)	<.001
Album, g/dL	1.05 (1.03, 1.07)	<.001	1454.33 (1017.43, 1891.22)	<.001
BMI, kg/m ²	1.0040 (1.0032, 1.0048)	<.001	120.62 (94.46, 146.78)	<.001
Pre-ESKD payment in 12m, 2017 USD	1.0000 (1.0000, 1.0000)	<.001	-0.01 (-0.02, -0.01)	<.001
Annual acute care payment				
Modality, HD vs. PD	1.11 (1.05, 1.18)	<.001	3752.32 (1847.32, 5657.32)	0.001
Hemoglobin, g/dL	0.97 (0.95, 0.99)	0.007	-915.37 (-1604.01, -226.73)	0.009
Album, g/dL	0.76 (0.72, 0.81)	<.001	-8710.21 (-10775.6, -6644.79)	<.001
BMI, kg/m ²	0.9959 (0.9916, 1.0002)	0.064	-165.49 (-312.35, -18.63)	0.027
Pre-ESKD payment in 12m, 2017 USD	1.0000 (1.0000, 1.0000)	<.001	0.18 (0.15, 0.21)	<.001
Annual rehabilitation payment				
Modality, HD vs. PD	1.66 (1.50, 1.83)	<.001	5493.46 (4568.12, 6418.80)	<.001
Hemoglobin, g/dL	0.97 (0.93, 1.00)	0.039	-232.27 (-565.45, 100.90)	0.172
Album, g/dL	0.62 (0.56, 0.69)	<.001	-5684.93 (-6740.17, -4629.68)	<.0001
BMI, kg/m ²	1.0023 (0.9947, 1.0100)	0.553	28.32 (-42.60, 99.25)	0.434
Pre-ESKD payment in 12m, 2017 USD	1.0000 (1.0000, 1.0000)	<.001	0.09 (0.08, 0.11)	<.001
Annual other non-dialysis payment[§]				
Modality, HD vs. PD	1.53 (1.48, 1.57)	<.001	7894.82 (7333.60, 8456.04)	<.001
Hemoglobin, g/dL	0.99 (0.98, 1.00)	0.115	-221.77 (-451.98, 8.45)	0.059
Album, g/dL	0.90 (0.88, 0.92)	<.001	-1973.85 (-2531.05, -1416.66)	<.001
BMI, kg/m ²	1.0053 (1.0033, 1.0074)	<.001	98.92 (55.08, 142.77)	<.001
Pre-ESKD payment in 12m, 2017 USD	1.0000 (1.0000, 1.0000)	<.001	0.08 (0.07, 0.10)	<.001
Annual dialysis access payment[†]				

Modality, HD vs. PD	1.21 (1.07, 1.38)	0.003	4568.60 (1280.23, 7856.96)	0.007
Hemoglobin, g/dL	0.95 (0.91, 0.99)	0.011	-1632.71 (-2927.62, -337.79)	0.014
Album, g/dL	0.80 (0.72, 0.88)	<.001	-4671.99 (-7520.84, -1823.14)	0.002
BMI, kg/m ²	0.9989 (0.9909, 1.0069)	0.786	-32.96 (-244.94, 179.03)	0.761
Pre-ESKD payment in 12m, 2017 USD	1.0000 (1.0000, 1.0000)	<.001	0.11 (0.05, 0.16)	<0.001

*Adjusting for hemoglobin, album, BMI, and pre-ESKD annual payment

#Includes payment for iv dialysis drug and other dialysis

†Includes payment for the dialysis procedure, oral dialysis drugs, additional treatments and add-ons, and clinician care in outpatient dialysis.

§Includes payment for non-dialysis Medicare expenditures, including Parts A, B and D.

†Excludes strata with outlier payment amounts.

HD: hemodialysis; PD: peritoneal dialysis; BMI: body mass index; CI: confidence interval; ESKD: end stage kidney disease; iv: intravenous; USD: US dollar

Supplemental Table 7. Modality and annual Medicare payments, by hospitalization days before ESKD

	Log normal regression				
	Among patients with hospitalization days 0-14 days*		Among patients with hospitalization days >14 days**		P-value for interaction between modality and hospitalization days before ESKD (>14 vs. 0-14 days)
	Payment ratio (95% CI) *, HD / PD	P-value	Payment ratio (95% CI) *, HD / PD	P-value	
Annual total payment	1.10 (1.07, 1.13)	<.001	1.15 (1.11, 1.20)	<.001	0.051

* Mean (SD) hospitalization days =3.4 (4.3), median (inter-quartile range) = 1 (0, 6) among patients with hospitalization days 0-14 days

** Mean (SD) hospitalization days =38.1 (32.5), median (inter-quartile range) = 28 (20, 44) among patients with hospitalization days >14 days

Supplemental Figure 1. Percentage of patients using PD during the first year, among 20,769 patients aged ≥ 67 years, with Medicare Part A&B coverage in one year prior to the first service date and using PD at some point in the first year of dialysis

