

Chapter IV

Medication Use Among Dialysis Patients in the Dialysis Morbidity and Mortality Study

Key Words:

Peritoneal dialysis
Antihypertensives
Phosphate binders
Vitamin D analogues

Hemodialysis
Erythropoietin
Antithrombotic agents
Analgesics

The USRDS Dialysis Morbidity and Mortality Study (DMMS) is an observational study in which demographic, comorbidity, laboratory, treatment, socioeconomic, and insurance data were collected for a large random sample of U.S. dialysis patients, using the patient's dialysis records. The study included 4 phases ("waves") of data collection on over 20,000 randomly selected dialysis patients over a 3-year period. Waves 1, 3, and 4 are historical prospective studies, in which data were collected for patients receiving in-center hemodialysis (HD) on December 31, 1993. Each includes over 5000 patients. Wave 1 data collection was completed in August, 1995 and preliminary descriptive results were reported in the 1996 Annual Data Report (USRDS 1996). Wave 3 and 4 were fielded simultaneously and data collection was completed during 1997. Wave 2 is unique in that it is a true prospective study. It includes a random sample of incident patients initiating dialysis in 1996 and early 1997, and it includes peritoneal dialysis (PD) in addition to HD patients. For Wave 2, PD patients were oversampled by a factor of 5 to result in comparable numbers of PD and HD patients. Baseline data collection was completed for Wave 2 in 1997 and included over 4000 patients. Preliminary descriptive results for Wave 2 baseline data were reported in the 1997 Annual

Data Report (USRDS 1997). A 9–12-month followup data collection, another unique feature of Wave 2, was completed in early 1998.

Each "wave" of the DMMS includes a data collection instrument for collecting "core" data which allows the compilation of a consistent set of fundamental data for research questions that require a large sample size. Data from Waves 1, 3, and 4 of the DMMS have been merged with outcome data for the same patients available in the USRDS database and analyses for various research questions are in progress. Similarly, baseline data from patients included in Wave 2 will be merged with their outcome data, once available. The eventual merging of Waves 1, 2, 3, and 4 baseline and outcome data will ensure adequate sample size to address research questions related to dialyzer reuse, adequacy of dialysis, and dialyzer membranes. The "core" data are also being used to develop a "comorbidity infrastructure" which will be useful for the investigation of many other important research questions. In addition, each Wave included a "non-core" component designed to address additional research questions that require smaller sample sizes. For example, in addition to the "core" data collected on all patients in Wave 1, data were also collected on anemia, nutrition, and vascular access on subsamples of the

patients. For Wave 2, additional data were collected on PD prescription and delivery, residual renal function, and an extensive patient questionnaire was administered at baseline with questions pertaining to quality of life, pre-ESRD care, modality choice, transportation, and rehabilitation.

Limited information has been available regarding patterns of medication use among dialysis patients. For the first time, Wave 2 also allowed the collection of data on medication use among dialysis patients. Waves 3 and 4 expanded further on the collection of data related to medication use, by also including data on dose and frequency in addition to the identity of medications.

This chapter reports on preliminary descriptive analyses of medication use as noted in the medical records of patients included in Waves 2, 3, and 4 of the DMMS.

Methods

Sample Frame and Patient Selection

A sample of U.S. dialysis units was randomly selected for each of Waves 2, 3, and 4 of the DMMS. The dialysis units included in Wave 3 and 4 are each a random selection of 25 percent of the dialysis units in the United States listed on the Master List of Medicare Approved Dialysis Facilities as of December 31, 1993. The Master List exists as part of the annual ESRD Facility Survey. Since Wave 2 included a sample of patients starting dialysis in 1996/97, the dialysis units for this Wave were a random selection of 25 percent of the dialysis units listed on the December 1993 Master List in addition to all new dialysis units opening after January 1, 1994. Additional information related to sampling of patients for Wave 2 has been reported previously (1997 ADR). From among these randomly selected dialysis units, the sample of patients selected for Waves 3 and 4 of the DMMS was selected from a national census of hemodialysis patients as of December 31, 1993. The 18 ESRD Networks provided this census of hemodialysis patients (Medicare and non-Medicare). For all Waves, patients were excluded if they were less than 15 years of age, if they were on home hemodialysis, or if they had a previous transplant. For Waves 3 and 4, patients were also

excluded if they were in training for any self-care treatment or if they were on peritoneal dialysis. For Wave 2, patients on peritoneal dialysis were included. Modality assignment for Wave 2 was defined on day 60 of ESRD. The modality assignment for patients on HD but who were training for PD on day 60 was deferred 10 days.

Data Collection

Facility personnel abstracted the “core” set of data questions for each patient from their dialysis records. For patients randomly selected for Wave 2 (both patients treated with peritoneal or hemodialysis), data on medication use was also collected. Medications prescribed to the patient at the study start (at 60 days of ESRD) were recorded (to a maximum of 15 medications as limited by the data collection form). In addition separate questions inquired specifically whether the patient was receiving erythropoietin or injectable vitamin D. Therefore the identity of a maximum number of 15-17 medications (depending on possible duplicate information related to erythropoietin and injectable vitamin D) is available for patients sampled in DMMS Wave 2. Waves 3 and 4 expanded further on the collection of data related to medication use, by also including data on dose and frequency in addition to the identity of medications. It also allowed more medications to be recorded than in Wave 2, to a maximum of 20 medications. Again, separate questions relating to the use of erythropoietin or injectable vitamin D were included, therefore the identity of a maximum of 20-22 medications is available for patients included in Wave 3 and 4. Medications that were prescribed on December 31, 1993 were to be recorded.

Analysis

This chapter includes descriptive data on medication use obtained from data from Waves 2, 3, and 4 of the DMMS. As the data were obtained from patient medication lists and data on patient’s medication compliance is not available, it should be noted that this chapter reflects medication prescription by physicians and not necessarily medication use by patients. The validity of this description is also dependent on the completeness and accuracy of the available medication lists from which data were abstracted. For example, non-prescription

medications taken by patients, but not included on medication lists may not be included.

Ninety-nine patients (2.5 percent) in Wave 2 and 261 patients in Waves 3 and 4 (2.7 percent) had no listed medications. This could represent incomplete data collection or that the patients were truly on no medications. As the former was felt more likely, patients with no medications listed were excluded from the following descriptive analyses.

Over 10,000 different entries were listed as medications among the patients included in these studies. An experienced pharmacist, knowledgeable in the field of dialysis, categorized these into 42 medication categories. The percent of patients prescribed these various medications was analyzed among 4 cohorts of patients:

- Patients on hemodialysis (point prevalent) on December 31, 1993 (from DMMS Wave 3 and 4 data)
- Patients starting dialysis (incident) in the last 4 months of 1993, therefore averaging approximately 60 days on dialysis (from DMMS Wave 3 and 4 data)
- Patients on hemodialysis approximately 60 days after start of ESRD in 1996/97 (from DMMS Wave 2 data)
- Patients on peritoneal dialysis approximately 60 days after start of ESRD in 1996/97 (from DMMS Wave 2 data).

For these 4 cohorts, overall frequencies were determined in addition to frequencies by cause of ESRD (diabetic or nondiabetic) and by age (less than 65 or 65 and over).

Demographics of Dialysis Patients by Year and Modality, 1993-1996/97

	1993 Hemodialysis		1996/97 Incident ^a	
	Point	Incident	Hemodialysis	Peritoneal
	Prevalent			Dialysis
	n=9830	n=995	n=1998	n=1919
Age, years (SD)	59 (15.4)	61 (15.6)	61 (15.6)	56 (15.4)
Race				
% White	51	63	57	68
% Black	41	29	34	22
% Asian	2	2	3	3
% Native American	1	2	1	1
% Other	4	3	5	4
Ethnicity				
% Hispanic	13	12	11	9
Sex				
% Female	49	45	47	47
Primary Cause of ESRD				
% Diabetes	33	40	43	44
% Hypertension	32	30	29	22
% Glomerulonephritis	14	11	7	10
% Other	21	19	20	23

^a PD and HD defined near day 60 of ESRD
 Source: Special Analysis

Table IV - 1
 USRDS 1998

Table IV-1

This allowed the comparison of use between:

- new PD and new HD patients in 1996/97
- new (incident) HD patients and point prevalent (on dialysis for variable duration) HD patients in 1993
- new HD patients in 1993 and 1996/97
- [It should be noted that these are not entirely comparable due to the differences in the maximum number of medications allowed to be listed on the data collection forms and the difference in time from which the data were abstracted i.e. at around 60 days of ESRD (Wave 2) or at an average of 60 days (Wave 3 and 4)]
- patients with diabetic and nondiabetic cause of ESRD
- patients less than 65 or 65 and greater

In the descriptive results that follow, no adjustments have been made for these demographic factors, or for comorbid conditions or other treatment parameters. The relationship of these baseline variables with outcomes is also not presented here.

Results

General Overview

Table IV-1 provides a demographic description of each of the cohorts. The 1993 point prevalent HD cohort (Waves 3 and 4) included 9,830 patients of whom 995 were started on dialysis in the last 4 months prior to December 31, 1993 (October to December) and who constitute the 1993 incident HD cohort. The incident sample was older (61 versus 59 years), more likely to be White (63 percent versus 51 percent), and more likely to be diabetic. There were 1,998 and 1,919 patients included in the 1996/97 incident HD and PD cohorts respectively. PD patients were on average younger (56 years versus 61 years), were less likely to be Black, and less likely to have hypertension as the primary cause of ESRD.

Overall, hemodialysis patients starting dialysis in 1996/97 were prescribed a median of 8 different medications in 1996/97. This was similar to the median number of medications prescribed among the 1993 incident cohort. The

Distribution of the Number of Medications among Hemodialysis Patients, 1993-1996/97

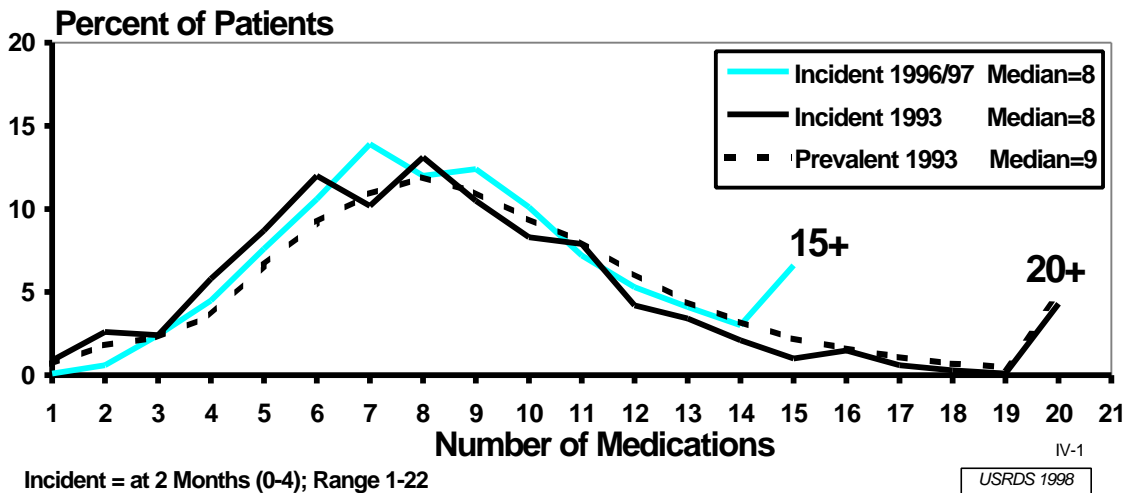


Figure IV-1

Distribution of the number of medications among hemodialysis patients according to DMMS WAVE 2, 1996 and DMMS WAVES 3 & 4, 1993. Patients are incident or point prevalent, on HD, and include Medicare and non-Medicare. Source: Special Analysis

Median Number of Medications among Incident Patients, 1996/97, by Modality, DM and Age Group

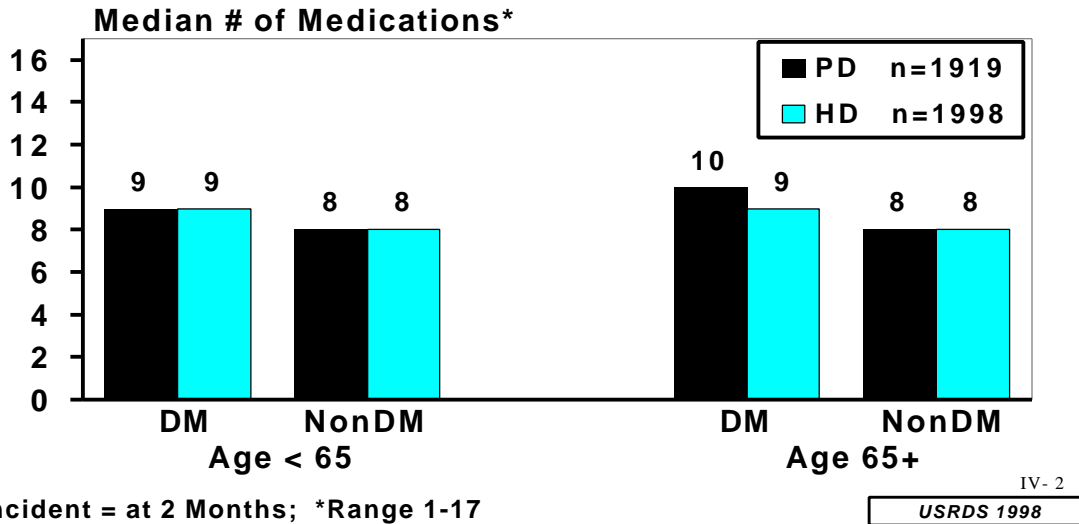


Figure IV-2

Median number of medications prescribed by modality, diabetes, and age group, DMMS WAVE 2, 1996. Patients are incident, either PD or HD on about day 60 of ESRD, and include Medicare and non-Medicare. Source: Special Analysis

median number of medications prescribed among prevalent patients established on dialysis in 1993 was 9. Figure IV-1 shows the distribution of the number of prescribed medications taken by hemodialysis patients who were on at least 1 medication. Although the range of possible numbers of cited medications differed, the curves are virtually superimposed for incident patients. Among new HD patients starting dialysis in 1993, 34 percent of patients were prescribed 10 or more medications and 8 percent were prescribed 15 or more different medications. The curve for prevalent patients is shifted slightly to the right of the incident curves, reflecting somewhat greater use of medications for patients established on dialysis.

Few studies have previously quantified medication use. A survey of medication records of 1,023 prevalent dialysis patients published in 1982 revealed patients were prescribed a *mean* of 7.7 medications (Anderson, 1982). More recent studies of single centers have found prevalent patients to be prescribed a *mean* of 10 prescription and 2 non-prescription medications

(Kaplan 1994) and 10.9 medications (Grabe 1997). In our analyses, the *mean* value was also higher, however the *median* value has been used here, as there was an upper limit to the number of medications that could be recorded in our data collection. The median is also not influenced by the few patients taking very many medications.

Among patients starting dialysis in 1996/97, the median number of prescribed medications was similar for those treated with peritoneal dialysis and hemodialysis, except among diabetics greater than age 65 where the number of medications used was higher among PD patients (Figure IV-2). As expected, in all age and modality categories, the median number of prescribed medications was higher among diabetics than non-diabetics. The median number of medications prescribed was similar for patients less than age 65 and age 65 and older, with the exception of diabetic PD treated patients, in whom the median number was higher for patients 65 and older compared to those less than 65 years of age.

Use of Specific Antihypertensives among Hemodialysis Patients

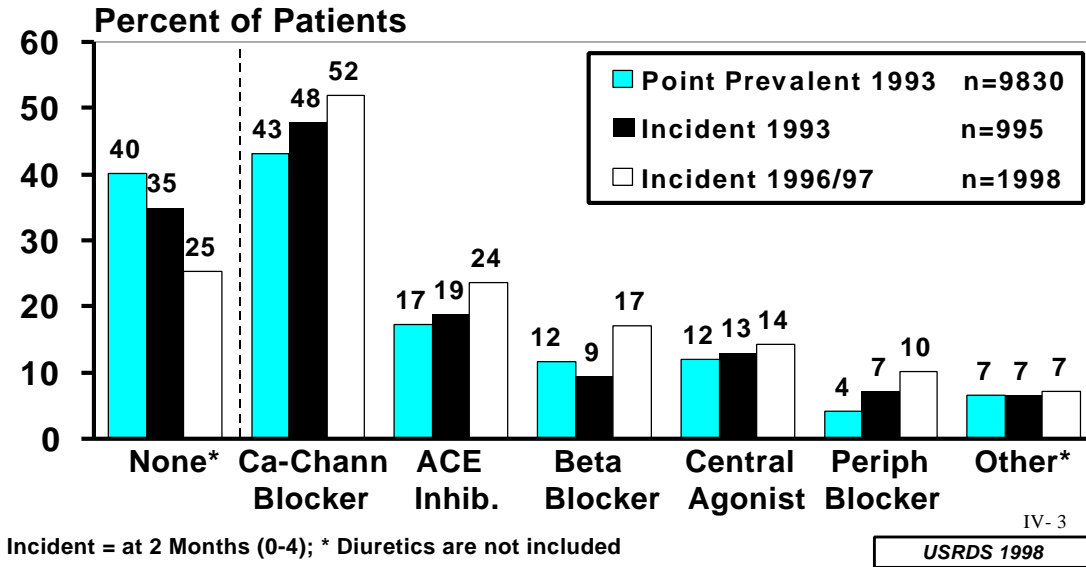


Figure IV-3

Prescription of categories of antihypertensive medications among hemodialysis patients according to DMMS WAVE 2, 1996 and DMMS WAVES 3 & 4, 1993. Patients are incident or point prevalent, on HD, and include Medicare and non-Medicare. Source: Special Analysis

Antihypertensives

Hypertension is a common condition among patients with ESRD. Antihypertensives used by dialysis patients in the DMMS have been categorized into the following groups: calcium channel blockers, ACE inhibitors, beta blockers (includes α and beta receptor blockers), central α_2 receptor agonists, peripheral α_1 receptor blockers, and others. It should be noted that beta blockers and calcium channel blockers also function as antianginal agents and the indication for their use among the patients in the DMMS is not recorded. They are considered here as antihypertensives. Diuretics are not considered here as antihypertensives in this population.

The use of antihypertensives among new dialysis patients is very high. Figure IV-3 shows only 25 percent of new HD patients were not using any antihypertensive medications in 1996/97 (i.e. 75 percent patients were using at least one antihypertensive medication). This

represents an increase in use from 65 percent in 1993 to 75 percent in 1996/97 among new hemodialysis patients. A previous multicenter study of 649 U.S. hemodialysis patients reported antihypertensive use among 58.7 percent of patients (Salem 1995) whereas a single center study of 72 patients reported that 67 percent of patients used antihypertensives (Cleary 1995). In Europe a wide range in antihypertensive use has been observed. A survey performed by the European Dialysis and Transplant Association in 1991 found that 83 percent of dialysis patients were receiving antihypertensives (Raine 1992). In contrast, in a unique French dialysis program that included long (24 hours per week) dialysis treatments on flat plate dialyzers and implementation of moderate dietary sodium restriction, only 1.6 percent of patients required antihypertensives (Charra 1992).

Figure IV-3 also shows the use of specific antihypertensives among HD patients. Calcium channel blockers were the most commonly used

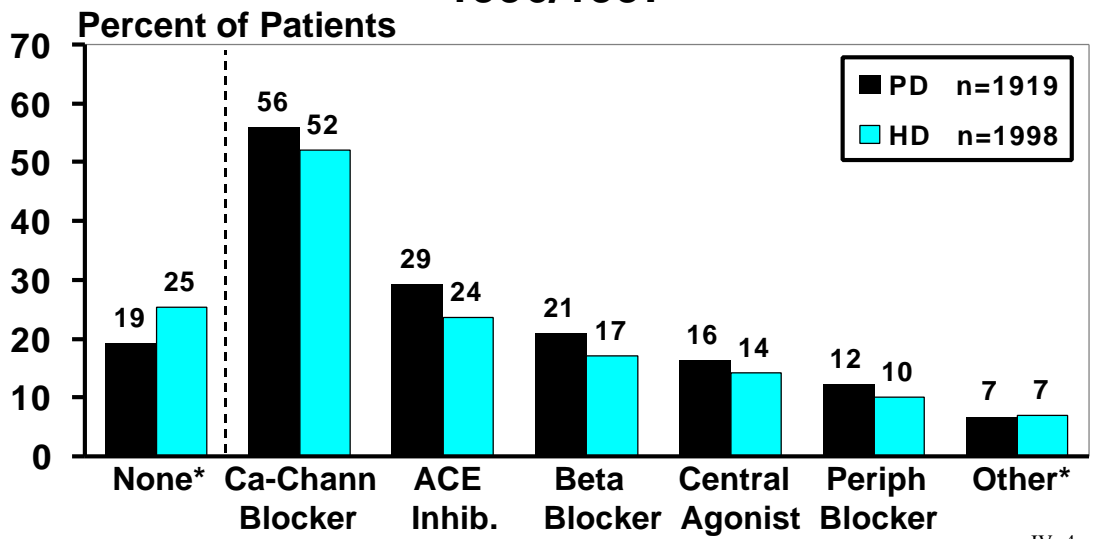
antihypertensives, followed by ACE inhibitors, beta blockers (includes α and beta receptor blockers), central α_2 receptor agonists, peripheral α_1 receptor blockers, and others. There has been an increase in the use of all categories of antihypertensives: calcium channel blockers increased from 48 to 52 percent, ACE inhibitors from 19 to 24 percent, beta blockers increased from 9 to 17 percent, central α_2 receptor agonists from 13 to 14 percent, and peripheral α_1 receptor blockers increased from 7 to 10 percent. This was true for both diabetics and nondiabetics and for patients less than or above age 65 with the following exceptions: 1) among diabetics under age 65, the use of calcium channel blockers decreased and 2) among patients 65 and over, for both diabetics and nondiabetics, the use of central α_2 receptor agonists decreased.

The use of antihypertensives was slightly less among established (prevalent) (60 percent) than

new hemodialysis patients in 1993 (65 percent), suggesting that antihypertensive use decreases with time on dialysis (Figure IV-3). This is accounted for by lower use of all types of antihypertensives (except beta blockers) among established compared to new patients. This is true for most diabetic and age categories.

Figure IV-4 shows that there is greater use of antihypertensives among new PD than new HD patients, since only 19 percent of PD patients were not on any antihypertensives compared to 25 percent of HD patients. This is true for both diabetics and nondiabetics and for patients age less than age 65 or age 65 and over. This is somewhat surprising given the prevailing general opinion that hypertension is better controlled on PD than HD as volume status is more easily controlled and stable on PD. Figure IV-4 also shows that there is a higher use of all types of antihypertensives among PD treated patients

Use of Specific Antihypertensives among Incident Peritoneal versus Hemodialysis Patients, 1996/1997



Incident = at 2 Months;* Diuretics are not included

IV-4
USRDS 1998

Figure IV-4

Prescription of categories of antihypertensive medications among HD vs PD patients according to DMMS WAVE 2, 1996. Patients are incident, either PD or HD on about day 60 of ESRD, and include Medicare and non-Medicare. Source: Special Analysis

(except "other" category)

Other Cardiovascular Medications

In 1996/97, approximately 22 percent of new HD and 17 percent of new PD treated patients were reportedly prescribed some form of nitrate. The use of nitrates was lower among PD treated patients for most ESRD cause and age subgroups evaluated. Nitrate use was also substantially higher among patients with diabetes as the cause of ESRD and among patients age 65 and over. Among HD treated patients, there was an increase in the use of nitrates from 1993 to 1996/97.

Overall, 13 percent of new HD and 11.4 percent of new PD patients were prescribed digoxin. Patients aged 65 and over were substantially more likely to be on digoxin than those less than 65. The use of digoxin increased from 1993 to 1996/97 for most subgroups with the exception of older nondiabetics. In general,

diabetics were somewhat more likely to be on digoxin.

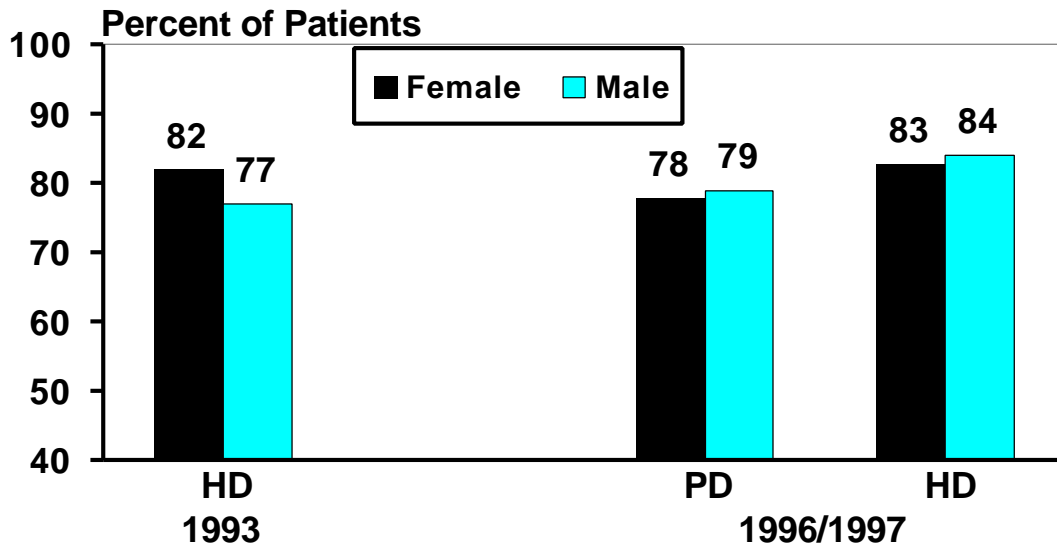
In 1996/97, approximately 8 percent of HD and 15 percent of PD patients were prescribed a lipid lowering agent. This large difference by modality was present among all ESRD cause and age subgroups evaluated. Use of lipid lowering drugs was slightly higher among diabetics.

Calcium and Phosphorus Balance

Phosphate Binders

In 1996/97, 78 percent of HD patients were prescribed a phosphate binder. Seventy-five percent were prescribed a calcium containing agent of which approximately one half were calcium carbonate and one half calcium acetate. In addition, 6.1 percent were prescribed an aluminum containing binder. Four percent of patients were using both a calcium and an aluminum containing binder.

EPO Therapy among Incident Patients by Modality and Sex, 1993 - 1997



Incident = at 2 Months (0-4)

IV-5
 USRDS 1998

Figure IV-5

Prescription of erythropoietin therapy by modality and sex according to DMMS WAVE 2, 1996 and DMMS WAVES 3 & 4, 1993. Patients are incident, PD or HD, and include Medicare and non-Medicare. Source: Special Analysis

Although among new PD treated patients, the use of calcium acetate and aluminum containing binders was lower than among HD treated patients, the use of calcium carbonate binders was substantially higher, resulting overall in a slightly greater use of phosphate binders among new PD (81 percent) than HD patients (78 percent). This pattern was true for most of the diabetic and age subgroups examined.

Use of phosphate binders increased from 1993 to 1996/97 from 72 to 78 percent among new hemodialysis patients. This was accounted for by an increase in calcium containing binders, particularly calcium acetate which increased in use from 34 percent to 40 percent. Use of calcium carbonate increased among patients less than 65 but decreased among patients over age 65 (diabetics and nondiabetics). The use of aluminum containing binders actually decreased (almost halved) among new diabetic HD patients but was unchanged among nondiabetics.

In 1993 there was higher overall use of phosphate binders among established patients (80 percent) than new (72 percent). This would be expected as phosphate control becomes more difficult as residual renal function declines. In particular, there was greater use of calcium acetate (34 to 39 percent) and a more than two fold higher use of aluminum containing binders (7 to 16.5 percent). Overall there was only a slight higher use of calcium carbonate and its use actually was lower among elderly diabetics and nondiabetics. The percent of patients using both aluminum and calcium containing agents was 4.3 percent among new patients whereas it was 10.1 percent among established patients.

Vitamin D analogues

Among patients starting dialysis, 42.2 percent of HD and 32.9 percent of PD patients were prescribed some form of vitamin D. Among the HD patients, 35.1 percent were using an intravenous and only 7.9 used an oral form. In contrast, among PD treated patients only 1.1 percent were reported to be prescribed intravenous form and 30.6 percent the oral form.

Erythropoietin and Iron

The use of erythropoietin (EPO) has increased among patients starting hemodialysis from 79 to 83 percent overall. Figure IV-5 shows that this increase has been mainly among males,

whose use of erythropoietin increased from 77 to 84 percent between the two time periods. In contrast, the use of EPO among new female hemodialysis patients in 1996/97 (83 percent) was not substantially higher than in 1993 (82 percent). There was also little increase among diabetics over age 65. Figure IV-5 also shows that for both females and males starting dialysis in 1996/97, the use of EPO was slightly less among PD compared to HD treated patients. This difference was largest among nondiabetics over the age of 65 and over and smallest among diabetics under the age of 64. The utilization of EPO was 5 to 7 percent higher among prevalent hemodialysis patients than among new hemodialysis patients indicating that use of EPO increases with time on dialysis.

Overall, the use of iron as recorded on the patient's medication list appeared to increase among patients starting hemodialysis from 1993 to 1996/97. This increase was mainly for parenteral iron, which increased three-fold over this time period. In 1996/97, at approximately 60 days of therapy, 43 percent of new patients were on oral iron, 6 percent were receiving parenteral iron, 2 percent were receiving both oral and parenteral, and 49 percent of patients were not on any iron. Among new patients in 1996/97, patients treated with PD were more likely to be treated with iron than hemodialysis patients (61 percent compared to 51 percent). However this represented mainly oral iron use, as only 1.9 percent of PD patients were reported to be using parenteral iron (compared to 6 percent of HD). It should be noted that this description of iron use is for a single point in time whereas parenteral iron is frequently administered intermittently according to results of iron studies. The DMMS Wave 1 Anemia Substudy collected more specific data on iron use. It found that, during a 3-month period, 11 percent of patients received parenteral iron and 14.7 percent received both parenteral and oral iron (USRDS 1996). The fact that the DMMS Wave 1 also included prevalent patients compared to new patients may also account for the observed difference with the present data.

Gastrointestinal Agents

Overall, approximately 30 percent of patients starting HD were prescribed an H₂ receptor antagonist or a proton pump inhibitor in 1996/97. This represents a 3-7 percent increase in the use

of these medications compared to new hemodialysis patients in 1993. Elderly nondiabetics were most frequently prescribed these medications both in 1993 (28 percent) and in 1996/97 (33 percent). Patients treated with PD were somewhat less likely to be receiving these agents (26 percent) than hemodialysis patients. This was true for all diabetic and age subgroups evaluated with the exception of elderly diabetics who were less likely to be receiving these medications if they were treated with HD. The use of these medications was higher among point prevalent than new (incident) patients suggesting an increase in use with time on dialysis.

Overall, approximately 13 percent of patients were prescribed a GI motility agent. As expected due to diabetic gastropathy, diabetics reported much higher use of these medications than nondiabetics for all age groups and cohorts evaluated. In 1996/97, almost 23 percent of diabetics under age 65 and 14 percent of patients 65 and over were prescribed a motility agent. Among diabetics, patients treated with PD were more likely to be prescribed such an agent than patients on HD, particularly among patients 65 and over. However, among nondiabetics, HD patients reported higher use than PD. For all subgroups, the use increased among HD patients from 1993 to 1996/97. There was higher use among prevalent patients compared to incident for all subgroups.

Analgesics

Overall, 12 percent of patients treated with hemodialysis and 9 percent of patients treated with peritoneal dialysis were prescribed some type of analgesic medication in 1996/97. Among patients starting PD, narcotics were used in 3.8 percent, NSAIDs in 1.9 percent, and other non-narcotics in 3.7 percent. ASA is excluded here (see below). Among patients starting HD, narcotics were used in 5.6 percent, NSAIDs in 1.7 percent, and non-narcotics in 5.1 percent. Less than 1 percent of patients were prescribed more than one of these types of medications. The use of analgesic medications did not appear to substantially differ between diabetics or nondiabetics or among patients less than or greater than 65 years. Comparing analgesic use among patients starting HD in 1993 to 1996/97, there appeared to be a reduction in use of all types of analgesics. In 1993, point prevalent

hemodialysis patients appeared to have higher analgesic use than incident patients.

Antithrombotic Agents

The prescription of ASA increased from 14 percent in 1993 to 18.5 percent in 1996/97 among new HD patients according to patient's dialysis medication lists. However, because ASA is an over the counter medication, which may be self-prescribed, this data may not accurately reflect the actual use of ASA. Similarly, the use of warfarin increased from 4.7 percent to 6.5 percent in this same time period. Interestingly, in 1996/97, the use of ASA and warfarin were only slightly lower among new PD patients (17 percent and 5.7 percent respectively) compared to HD patients suggesting that the presence of a vascular access does not substantially increase use. In 1993, the percent of point prevalent patients prescribed warfarin or ASA was higher than among incident patients again suggesting greater use of these medications with time on dialysis.

Endocrine/Hormonal Agents

Treatment of Diabetes

Data from the DMMS Wave 2 suggest that among new HD patients with diabetes as the cause of ESRD, 44 percent of patients less than age 65 and 41 percent of patients 65 and over are not prescribed a hypoglycemic agent (insulin or oral hypoglycemic). Among this cohort, the use of insulin and oral hypoglycemics was 56.5 percent and 11.7 percent respectively among patients less than 65 (2 percent using both) and 46.3 percent and 13.8 percent respectively among patients 65 or greater (1.3 percent using both).

Among patients with causes of ESRD other than diabetes, diabetes can occur as a comorbid condition. Previous USRDS data indicate that this is true for over 10 percent of dialysis patients (USRDS 1992). Among patients who did not have ESRD due to diabetes the use of insulin and oral hypoglycemics was 3.9 and 2.1 percent respectively for patients who were less than 65 and who started HD in 1996/97. Insulin and oral hypoglycemic use was 4.8 and 3.0 percent respectively among those 65 and greater. The use of insulin and oral hypoglycemics appeared to increase from 1993 to 1996/97 among patients

Estrogen use in Female Dialysis Patients over Age 50

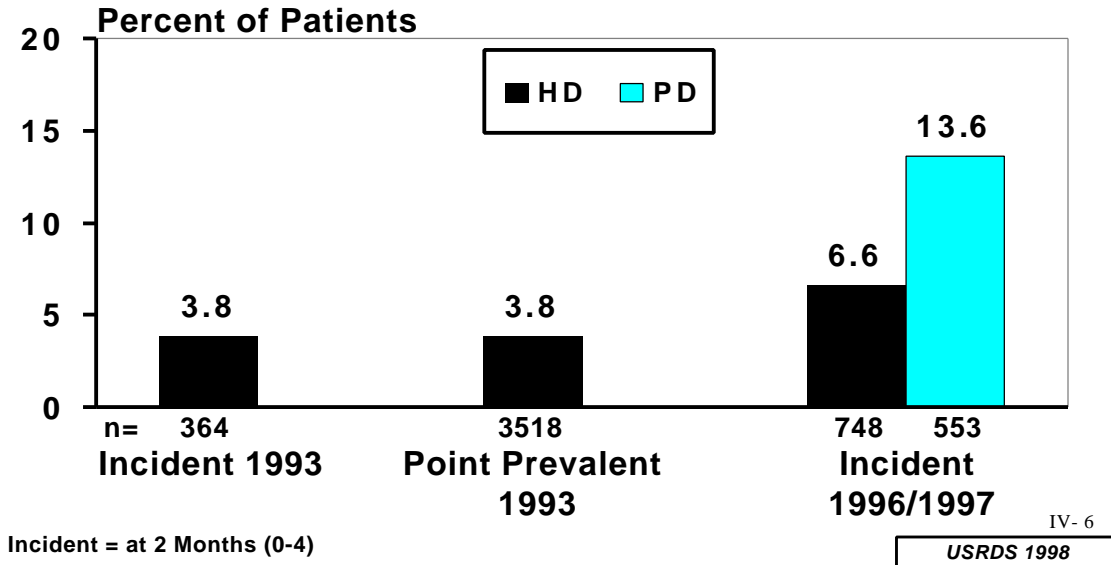


Figure IV-6

Prescription of estrogen therapy among female dialysis patients aged 50+ according to DMMS WAVE 2, 1996 and DMMS WAVES 3 & 4, 1993. Patients are incident or point prevalent, on PD or HD, and include Medicare and non-Medicare. Source: Special Analysis

with diabetes as the cause of renal failure, but not among patients with nondiabetic ESRD.

Thyroid Replacement Therapy

Overall, 10 percent of HD and 11 percent of PD patients starting dialysis in 1996/97 were on thyroid replacement therapy. Patients 65 and over were 1.5 to 2.5 times more likely to be on thyroid replacement than patients less than 65. In general, diabetics were also more likely to be on thyroid replacement.

Estrogen Replacement Therapy

In the following description of estrogen use, female patients were subcategorized as less than 50 years or age 50 and above. Among patients starting dialysis in 1996/97, only 6.6 percent of females over the age of 50 were prescribed estrogens, although this was an increase from 1993 (3.8 percent, both incident and point prevalent samples) (Figure IV-6). This is consistent with previous observations of low

estrogen use in post-menopausal dialysis patients (Holley 1997). Of interest, the DMMS-2 data indicate that estrogen use is substantially greater among PD treated patients than HD treated patients (13.6 versus 6.6 percent). Among HD patients, the use of estrogens is actually similar among patients both below age 50 and above age 50 and in 1993 was substantially higher among point prevalent compared to new hemodialysis patients.

Among female patients less than age 50, less than 1 percent were recorded to be on birth control pills. We speculate that there may be underreporting.

Psychiatric Medications

Among patients starting hemodialysis in 1996/97, antidepressants were prescribed among 12 percent of patients, a reported increase from 8 percent in 1993. These medications are frequently used for the treatment of peripheral

neuropathy among ESRD patients and as expected, use was generally higher among diabetics than among nondiabetics (up to 2 fold higher in some subgroups). Overall, and for most subgroups, the use of antidepressants was not substantially different for patients treated with PD versus HD, however, among patients with diabetes as the cause of ESRD and who were 65 and over, patients treated with PD were substantially more likely to be on an antidepressant (10 percent versus 17 percent).

Benzodiazepines were reportedly prescribed in 8.2 percent of new HD and 7.6 percent of new PD patients in 1996/97. There are no substantial differences in benzodiazepine use by modality, cause of ESRD, age, or year. There does appear to be higher benzodiazepine use among point prevalent compared to incident patients in 1993, suggesting greater use with time on dialysis.

Vitamins

Approximately 64 percent of HD and 67 percent of PD patients new to dialysis in 1996/97 were reportedly prescribed multivitamins. Overall there was slightly more use than in 1993 and use was higher among point prevalent patients established on dialysis compared to those starting dialysis.

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