## Highlights

- 2005 Research Summaries

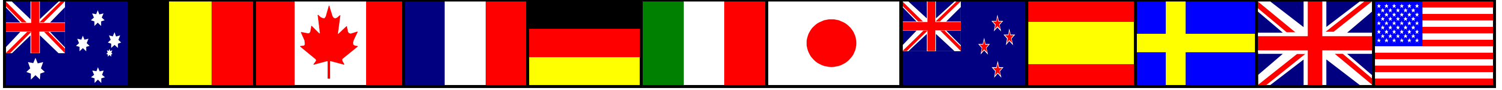
## Inside this Issue

- New Elements for DOPPS III Data Collection

# The DOPPS Report

*Newsletter of the Dialysis Outcomes and Practice Patterns Study*

*November 2005*



## DOPPS III Launches with New Features

The Dialysis Outcomes and Practice Patterns Study (DOPPS) has been very successful in the decade since its inception. By September 2005, DOPPS data had generated over 60 papers published or in press. DOPPS results have been the focus of numerous symposia and lectures worldwide.

Launched as a prospective, longitudinal, observational study of hemodialysis facilities and patients in 1996, DOPPS I collected data for five years in the US and two years in France, Germany, Italy, Japan, Spain, and the United Kingdom beginning in 1998/99. The success of DOPPS I resulted in the extension of the study into a new stage, DOPPS II (2002-2004), and the added participation of five new countries—Australia, Belgium, Canada, New Zealand, and Sweden.

This year, the DOPPS has launched another stage—DOPPS III—that will collect data through the end of 2007. Implementation of DOPPS III was prompted by new research questions in the field, an increased demand for scientific evidence, and the recognition that DOPPS is in a unique position to contribute to an even greater understanding of the relationship between hemodialysis practices and outcomes. DOPPS III not only provides for continued data collection from a representative sample of approximately 15,000 subjects in 12 countries, but will allow for more precise collection of clinical and laboratory markers. The DOPPS will continue to collect detailed information on selected patients as well as facility and physician practices.

Three new major components of DOPPS III include: (1) a Processes of Care study, which will be used to update the DOPPS facility-level questionnaires and enhance their focus on practice patterns, (2) an international Web-based data collection system developed by the University Renal Research and Education Association (URREA), and (3) a number of validated survey instruments have now been incorporated into the DOPPS Patient Questionnaire to address additional domains of disease and care. These components are discussed on pages 8—9.

**DOPPS Country Investigators**: *Australia*: Alex Disney, MD · Peter G. Kerr, MD; *Belgium*: Michel Jadoul, MD · Norbert H. Lameire, MD; *Canada*: Jean Ethier, MD · David C. Mendelssohn, MD, FRCPC; *France*: Bernard Canaud, MD · Christian Combe, MD; *Germany*: Jürgen Bommer, MD · Volker Wizemann, MD; *Italy*: Vittorio Andreucci, MD · Francesco Locatelli, MD; *New Zealand*: Mark R. Marshall, MD; *Spain*: Luis Piera, MD · José Miguel Cruz, MD; *Sweden*: Björn Wikström, MD · Stefan H. Jacobson, MD, PhD; *United Kingdom*: Roger Greenwood, MSc, MD, FRCP · Hugh C. Rayner, MD, FRCP

**Japan DOPPS Steering Committee**: Prof. Dr. Kiyoshi Kurokawa, MD, MACP · Prof. Dr. Yasushi Asano, MD
Prof. Dr. Akira Saito, MD · Prof. Dr. Tadao Akizawa, MD, PhD · Prof. Dr. Takashi Akiba, MD, PhD · Prof. Dr. Shunichi Fukuhara, MD, MSc, DMSc

**US DOPPS Steering Committee**: Friedrich K. Port, MD, MS · Philip J. Held, PhD · Ron Pisoni, PhD, MS · Sylvia Ramirez, MD, MPH, MBA
Robert A. Wolfe, PhD · Eric W. Young, MD, MS[†] · Mahesh Krishnan, MD, MPH · John Acquavella, PhD · Rob Brenner, MD
Chip Cangialose, PhD · Catherine Stehman-Breen, MD · Marcia L. Keen, PhD, MS

[†]Indicates investigators subcontracted with the University of Michigan

The DOPPS is a worldwide hemodialysis study coordinated by the University Renal Research and Education Association (URREA).
The DOPPS is supported by scientific grants from Amgen, Inc. and Kirin Brewery, Ltd. without restrictions on publications.
Web site: www.dopps.org E-Mail: dopps@urrea.org

## Key Findings from DOPPS Research in 2005

The following summaries of a few of the DOPPS papers published in 2004 and 2005 highlight recent key findings from the study. More detail and PowerPoint slides for these and other DOPPS publications can be found at the Web site, **www.dopps.org.** Citations to the published papers are included in the list on page 11.

### Predictors and Consequences of Altered Mineral Metabolism (Young et al.)

Altered mineral metabolism contributes to bone disease, cardiovascular disease, and other clinical problems in patients with end-stage renal disease. Young et al looked at the status of abnormal mineral metabolism in a representative group of hemodialysis (HD) facilities and patients in the seven DOPPS I (1996-2001) countries. For many indicators of mineral metabolism—serum concentrations of phosphorus, albumin-corrected calcium, calcium-phosphorus product, and intact parathyroid hormone (PTH)—a high percentage of patients had results falling outside the recommended range (**Table 1**).

All-cause mortality was significantly and independently associated with serum concentrations of phosphorus, calcium (albumin corrected), calcium-phosphorus product, and dialysate calcium. Cardiovascular mortality was significantly associated with serum concentrations of phosphorus, calcium, calcium-phosphorus product, and PTH (**Table 2**).

Parathyroidectomy varied four-fold across the seven DOPPS countries and was significantly associated with baseline concentrations of phosphorus, calcium, calcium-phosphorus product, and dialysate calcium concentration. The large variation across countries suggests inconsistent indications and thresholds for parathyroid surgery and suggests the need for clinical trials to inform best practice guidelines.

Treatment options such as vitamin D therapy and phosphorus binders were used inconsistently. Only 52% of patients received some form of vitamin D therapy, with parenteral vitamin D preparation restricted almost exclusively to the United States. Vitamin D was potentially underused in up to 34% of patients with high PTH and overused in up to 46% of patients with low PTH. Phosphorus binders were used by 81% of patients, with potential overuse in up to 77% of patients with low serum phosphorus concentration and potential under-use in up to 18% of patients with a high serum phosphorus concentration.

This study expands our understanding of the relationship between altered mineral metabolism and patient outcomes, and the evidence provided by DOPPS supports the K/DOQI guideline levels for calcium and phosphorus. It also identifies several potential opportunities for improving the use of vitamin D therapy and phosphorus binders, as well as other treatments.

| | | | | % of patients | |
|---|---|---|---|---|---|
| Serum Value (n) | Recommended range** | Mean (SD) | Median | Below lower range limit | Above upper range limit |
| Phosphorus (n=8,251) | 3.5-5.5 mg/dl | 5.8 (1.8) | 5.6 | 7.4 | 51.7 |
| Albumin-corrected calcium (n=6,898) | 8.4-9.5 mg/dl | 9.6 (1.0) | 9.5 | 9.3 | 50.2 |
| Ca-Phos product (n=8,057) | <55 $mg^2/dl^2$ | 54 (17) | 53 | N/A | 43.5 |
| PTH (n=5,240) | 150-300 pg/ml | 271 (396) | 142 | 51.1 | 26.7 |
| Dialysate Calcium (n=8,400) | 2.5 mEq/l | 2.9 (0.4) | 3.0 | 5.3 | 59.5 |

**Table 1**: Descriptive measures of mineral metabolism lab values: DOPPS I (1996-2001, seven countries) ** - K/DOQI

| Laboratory Measure | RR | 95% CI | p-value |
|---|---|---|---|
| Phosphorus (per 1 mg/dl) | 1.09 | 1.05-1.12 | <0.001 |
| Albumin-Corrected Calcium (per 1 mg/dl) | 1.14 | 1.07-1.21 | <0.001 |
| Calcium-Phosphorus Product (per 5mg$^2$/dl$^2$) | 1.05 | 1.05-1.05 | <0.001 |
| iPTH (per 100 pg/ml) | 1.02 | 1.00-1.03 | 0.03 |
| Dialysate Calcium (per 1 mEq/L) | 1.09 | 0.92-1.30 | 0.30 |

**Table 2**: Association between cardiovascular mortality and markers of mineral metabolism. RR = Relative Risk, CI = Confidence Interval; Models stratified by country and adjusted for age, sex, race, time on dialysis, hemoglobin, spKt/V, albumin, and 14 summary comorbid conditions, accounted for facility clustering (n=16,158). DOPPS I (1996-2001, seven countries)

## Mineral Metabolism and Hemoglobin Concentration among Hemodialysis Patients (Kimata et al.)

Several studies have indicated a strong relationship between high calcium and phosphorus levels with higher mortality risk, and other studies have observed a strong relationship between low hemoglobin (Hgb) levels and higher mortality risk and poorer quality of life. Kimata et al used DOPPS II (2002-2004) data to provide one of the first detailed examinations of mineral metabolism and Hgb concentration in dialysis patients, revealing a strong association between Hgb levels and serum concentrations of calcium, phosphorus, and intact parathyroid hormone (iPTH) in 12,089 hemodialysis patients.

The authors found that the odds of a patient having a Hgb ≥11 g/dl were substantially greater when patients had higher serum calcium and phosphorus levels and, as shown in **Figure 1**, for patients with lower iPTH levels. Furthermore, using DOPPS data collected every four months, the researchers found that for every 1 mg/dl rise in a patient's serum phosphorus and albumin-corrected serum calcium levels over a four-month period, hemoglobin values rose an average of 0.11 g/dl and 0.17 g/dl, respectively. These results suggest that the wide variation in anemia control across dialysis units may not only be a reflection of differences in patient co-morbidity, nutrition, inflammation, and use of erythropoietin and intravenous iron, but may be explained in part by the broad facility variability in levels of mineral metabolism markers. The study suggests that iPTH levels above the guidelines may contribute to anemia in hemodialysis patients. Since higher serum calcium and phosphorus levels are associated with worse outcomes (see page 2), these observations do not lead to practice recommendations for calcium and phosphorus. However, they point to the need for additional research to increase our understanding of the underlying mechanisms relating levels of mineral metabolism markers with hemoglobin concentrations.

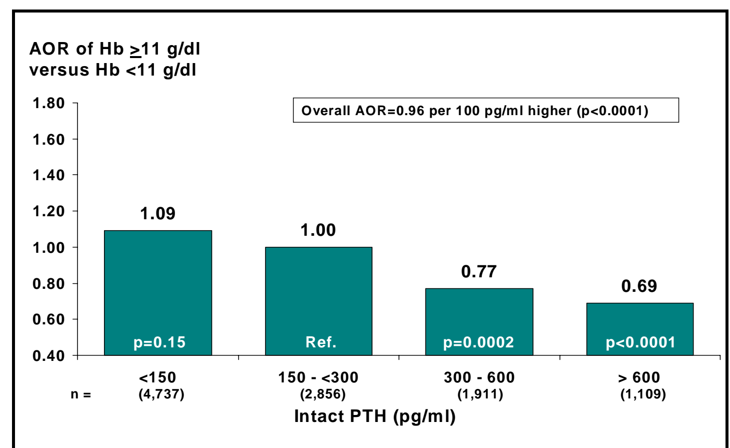



**Figure 1:** AOR of having target Hb ≥11 vs <11 g/dl by categories of patient-level iPTH. The model was adjusted for age, sex, black race, cause of ESRD, years on dialysis, BMI, 15 comorbid conditions, spKt/V, ferritin, transferrin saturation, rHuEpo dose (units/week), serum albumin, calcium, and phosphorus, prior parathyroidectomy, catheter use, whether receiving vitamin D, diagnosis of malnourishment, and country, accounting also for facility clustering effects. DOPPS II (2002-2004, 12 countries)

### Factors Associated with "Do Not Resuscitate" Orders and Rates of Withdrawal from Hemodialysis (Fissell et al.)

Hemodialysis patients live with a high burden of morbidity and are at increased risk for death compared with the general population. Consensus on how to discuss and handle "do not resuscitate" (DNR) orders and uniform practice patterns for withdrawal from dialysis do not exist within the international nephrology community. It is likely that DNR and withdrawal practice patterns vary by practitioner, by dialysis unit, and by geographic region.

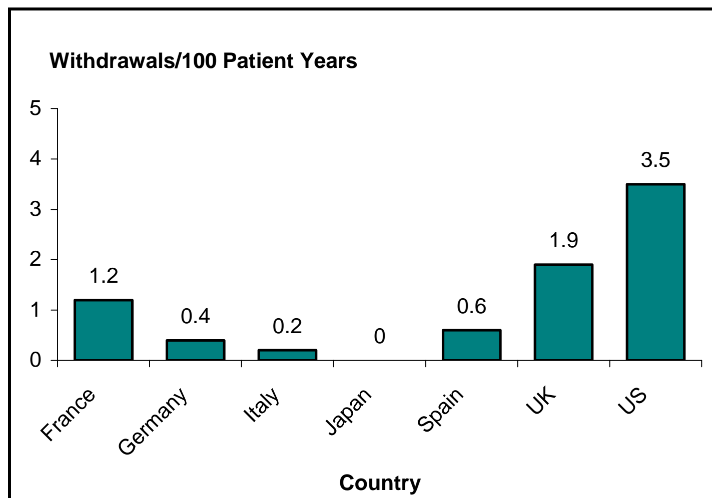



**Figure 2:** Withdrawal rates by country: DOPPS I (1996-2001, seven countries). Unadjusted prevalent cross-section of patients (n=8,615)

Fissell et al used data from DOPPS I (1996-2001) to determine and better understand patterns of DNR and withdrawal among hemodialysis patients in order to improve their end-of-life care. DNR orders were tabulated at study entry from a prevalent cross-section of patients (N=8,615), using multivariate logistic regression to investigate characteristics associated with DNR status, Cox models to identify risk factors for withdrawal from hemodialysis, and scores from the mental component summary (MCS) and physical component summary (PCS) of the Kidney Disease and Quality of Life™ short form (KDQoL™ SF-36) to assess health-related quality of life.

The United States displayed the highest prevalence of DNR orders (7.5%) and highest rate of withdrawal from hemodialysis (3.5 per 100 patient-years). Significant and independent associations with a higher odds ratio (OR) of DNR were observed for older patients (OR=1.16 per 10 years older, p=0.03) and residence in a nursing home (OR=2.34, p=0.003). Furthermore, the relative risk (RR) of withdrawal from dialysis was much greater for patients who had a DNR order (RR=2.38, p<0.001). Patients who withdrew from hemodialysis died within a mean of 7.8 days and a median of 6.0 days **(Figure 2)**.

The higher prevalence of DNR and higher rate of withdrawal from hemodialysis in the United States are consistent with the country's legal and cultural emphasis on patient autonomy. By showing characteristics associated with these outcomes, this study contributes to our understanding of why hemodialysis patients request DNR or withdraw from treatment.

### Kidney Transplantation and Wait-Listing Rates from the International DOPPS (Satayathum et al.)

Satayathum et al used DOPPS I (1996–2001) data to describe kidney transplantation rates among hemodialysis patients in seven countries. Comparisons across the countries showed that transplantation rates were at least seven times greater among patients 18-65 years old than among patients over 65 years old. In an analysis limited to patients aged 18 to 65 years, the mean number of kidney transplants per 100 patient-years varied markedly across countries, from 22 in Spain to 11-13 in the United Kingdom and France, 6 in Germany, Italy, and the US, and 0.4 in Japan. The relative kidney transplant rates by country after

| Country | RR Tx | p-value | 95% CI* |
|---|---|---|---|
| Spain | 3.04 | <0.0001 | (2.22, 4.16) |
| France | 1.52 | 0.004 | (1.15, 2.01) |
| United Kingdom | 1.45 | 0.04 | (1.02, 2.05) |
| United States | 1.00 | Ref | Ref |
| Italy | 0.84 | 0.39 | (0.57, 1.24) |
| Germany | 0.79 | 0.23 | (0.54, 1.16) |
| Japan | 0.04 | <0.0001 | (0.02, 0.09) |

**Table 3 :** Adjusted relative rate of kidney transplantation (RR Tx), by country. DOPPS I (1996-2001, seven countries)

**Notes:** Restricted to patients aged 18 to 65 years (n=5,267). Relative rates for transplantation were estimated by Cox proportional hazards regression, left-truncated for time since start of dialysis. Adjusted for age, race, sex, years with ESRD, predialysis serum albumin, serum creatinine, serum phosphorus, hematocrit, nursing home status, yearly household income, smoking status, hospital or non-hospital-based facility, education level, country, body mass index (BMI), and 14 summary comorbidities. Analyses accounted for facility clustering effects. *CI=confidence interval

adjusting for patient factors still show large differences across countries (**Table 3**). The relative rate of kidney transplantation was significantly lower among black and Asian patients than among white patients, and lower among patients with coronary artery disease, congestive heart failure, peripheral vascular disease, cancer, psychiatric disease, or recurrent skin disease, and patients in a nursing home, having less than a high school education, or having lower income. In the US, transplantation rates varied 2.4-fold across different US geographic regions after adjusting for differences in patient characteristics.

DOPPS II (2002–2004) data were used to describe kidney transplant wait-listing across the 12 DOPPS II countries. The percentage of prevalent 18-65 year-old hemodialysis patients who were on a kidney transplant waiting list (**Table 4**) varied from 10% in Japan to 24-28% in the US and Sweden, 34-40% in France, Belgium, Australia/New Zealand, Canada, Italy, and Germany, and 48-55% in Spain and the United Kingdom. In the US, the odds of being on a kidney transplant waiting list were significantly lower for black (vs. white) hemodialysis patients (AOR=0.59, p=0.007), and lower for patients with congestive heart failure, lung disease, or cancer. Furthermore, kidney transplant wait-listing was found to vary more than 2.4-fold across nine US geographic regions when adjusted for differences in patient demographics, 14 classes of comorbidity, and type of dialysis unit.

These data from DOPPS confirm wide variation in kidney transplantation rates and transplant wait-listing by country, even after adjusting for differences in case mix. International results consistently showed higher transplantation rates for younger, healthier, better-educated, and higher-income patients.

| Country | DOPPS Sample (n) | Kidney Transplant Waiting List (%) |
|---|---|---|
| United Kingdom | 249 | 55 |
| Spain | 254 | 48 |
| Germany | 300 | 40 |
| Canada | 290 | 39 |
| Italy | 253 | 39 |
| Australia/New Zealand | 274 | 36 |
| Belgium | 201 | 35 |
| France | 182 | 34 |
| Sweden | 258 | 28 |
| United States | 1,129 | 24 |
| Japan | 884 | 10 |

**Table 4:** Percentage of hemodialysis patients on kidney transplant waiting lists. DOPPS II (2002-2004, 12 countries), prevalent cross-section of hemodialysis patients, ages 18-65 years

## Statin Use Is Associated with Mortality Reduction in Hemodialysis Patients (Mason et al.)

Cardiovascular disease is the most common cause of mortality in patients with end-stage renal disease (ESRD). Many factors contribute to the high rate of cardiac deaths in this population, including traditional risk factors typically identified in the general population and renal-specific risk factors.

The cardiovascular benefits of HMG-CoA reductase inhibitors (statins) have been clearly established in the general population, but not in dialysis patients. Mason et al examined statin prescription patterns and assessed the relationship between statin prescription and clinical outcomes in hemodialysis patients from the seven countries in DOPPS I (1996-2001). Cox regression models tested the association between statin prescription and the risk of mortality and cardiac events, with adjustments for common demographic factors and comorbid conditions.

Statins were prescribed for 12% of hemodialysis patients from a prevalent cross-section in early 2000. Most facilities (81%) prescribed statins to fewer than 20% of their patients.

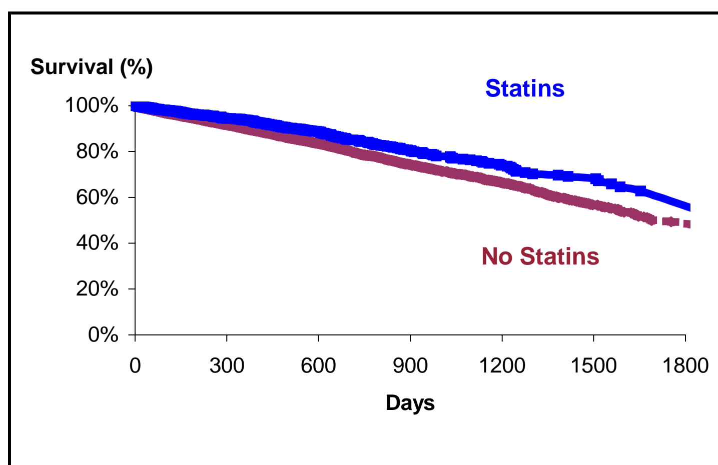



**Figure 3.** Adjusted survival curve for all-cause mortality, patients prescribed statins versus not prescribed statins. Estimates were calculated from a Cox regression model adjusted for age, sex, race, body mass index, serum albumin, hemoglobin, time with end-stage renal disease, normalized protein catabolic rate, and summary comorbid conditions. Statin use was modeled as a time-varying covariate, although the curves presented here represent no statin use versus continuous statin use.

Characteristics of patients that significantly ($p<0.05$) increased their odds of taking a statin included younger age, being female, fewer years on dialysis, presence of coronary artery disease, peripheral vascular disease, and diabetes. Patients who dialyzed in facilities that reported using aggressive hyperlipidemia therapy were almost twice as likely to receive a statin as patients who received dialysis in facilities that did not report using this therapy ($p=0.0006$).

Patients prescribed statins had a 31% lower relative risk of death compared with those who were not prescribed statins ($p<0.0001$) (**Figure 3**). Statins were associated with a 23% lower cardiac mortality risk ($p=0.03$) and a 44% lower non-cardiac mortality risk ($p<0.0001$). At the facility level, prescribing statins was associated with a lower overall mortality rate, with 5% lower risk for every 10% increase in the percentage of patients prescribed statins within the facility ($p=0.02$).

These observations of statin prescription associated with reduced mortality in hemodialysis patients provide additional support for the value of statin therapy in this patient group. Recently, a randomized trial (Wanner C et al. *N Engl J Med.* 2005: 353:238-48) failed to see a significant benefit in patients randomized to a particular statin prescription. However, this study was limited to diabetic dialysis patients and restricted to lipid LDL cholesterol levels of 80-190 mg/dl, among other restrictions.

This observational study suggests that statins may be underprescribed, given dialysis patients' increased risk for cardiovascular complications. The study also suggests that more frequent use of statins may lead to improved health and longevity for dialysis patients; randomized trials now under way will help determine the clinical value of prescribing statins to dialysis patients.

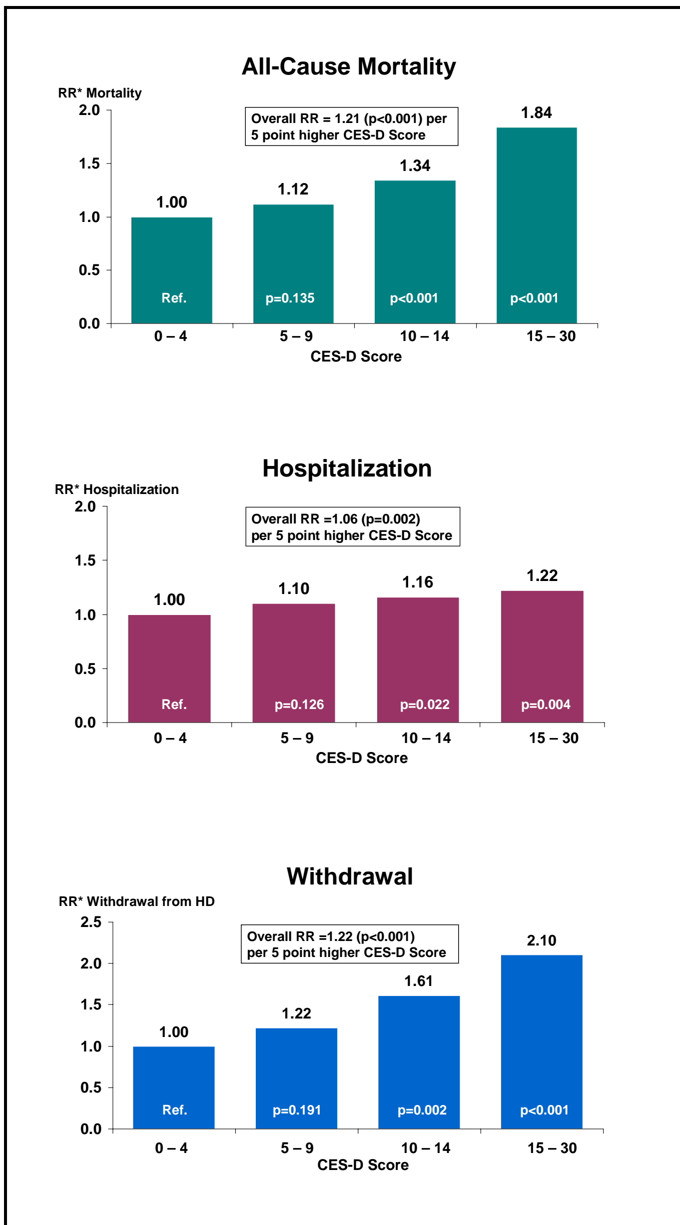



**Figure 4.** Adjusted relative risks of all-cause mortality, hospitalization, and withdrawal from dialysis by Center for Epidemiological Studies Depression Screening Index score. (N =9,382)

## Screening for Depression in Hemodialysis Patients: Associations with Diagnosis, Treatment, and Outcomes (Lopes et al.)

Depressive symptoms and depression are the most frequent psychological problems among hemodialysis patients with end-stage renal disease. Lopes et al used the Center for Epidemiological Studies Depression Screening Index (CES-D) short form to assess the prevalence of depressive symptoms and physician-diagnosed depression (PDD) among 9,382 hemodialysis patients randomly selected from dialysis centers in the 12 countries in DOPPS II (2002-2004).

In prior studies, a CES-D score of ≥10 was consistent with possible depression. The prevalence of physician-diagnosed depression (PDD) was 14% overall, but among patients with a CES-D score ≥10 it was 43%. Japan had the lowest prevalence of PDD (2%) but similar CES-D scores as other countries. In contrast, the US had the highest prevalence of PDD (22%), but the lowest prevalence of patients with a CES-D score ≥10 (39%). The percentages of patients with CES-D scores ≥10 who were taking prescription antidepressants varied widely, from 3% in Italy to 28-29% in Sweden and the US.

Cox regression models showed that CES-D scores ≥10 were associated with a significantly higher relative risk (RR) of all-cause mortality (RR=1.42 or 42% higher risk of mortality), hospitalization (RR=1.12 or 12% higher risk of hospitalization), and withdrawal from HD (RR=1.55 or 55% higher risk of withdrawal). **Figure 4** shows these associations in greater detail by different ranges of CES-D scores, using a score of <5 as a reference.

Based on these results, the authors conclude that the use of screening instruments for depressive symptoms may aid medical personnel in identifying hemodialysis patients who need special care in order to improve their quality of life, reduce hospitalization, and increase survival.

For more information on these and other published papers, please visit the DOPPS web site at www.dopps.org. Also available on the web site are links to PubMed and PowerPoint slide presentations of published DOPPS research.

## New Features for DOPPS III Data Collection

### New Data Collected on the Patient Questionnaire

The DOPPS Patient Questionnaire (PQ) has undergone some substantial changes for the new phase of the study. The PQ will be administered three times in DOPPS III—allowing new areas of care to be investigated, such as patient satisfaction, adherence to medical guidelines, patient self-management, sleep quality, bone disease, family support, vascular access use, and nutrition.

### Processes of Care Study Adds New Perspective

During DOPPS I and II, investigators learned that certain practice indicators, such as AV fistula use and K/DOQI guideline levels for hemoglobin, calcium, and phosphorus, are related to improved outcomes such as greater longevity, less frequent hospitalizations, and better quality of life. What is still not well understood are the "processes of care" that can impact the achievement of these optimal practice patterns.

Thus a Processes of Care study has been designed as part of DOPPS III to help elicit information about the processes that impact the practice patterns at dialysis facilities. Starting in July 2005, a subsample of 18 US dialysis facilities participating in DOPPS III was randomly selected for the study, which resulted in 58 qualitative, semi-structured interviews with medical directors, nurses, social workers, and dietitians at these facilities. The interviewees provided detailed information about their unit practices and how they address the challenges they face in delivering optimal care. It is hoped that data gathered from these interviews will help to uncover additional important practices for successfully treating end-stage renal disease. The findings from the Processes of Care study will be used to update the DOPPS Medical Director Survey (MDS) and the Unit Practices Survey (UPS) with questions reflecting new and emerging practices that may be associated with better outcomes for patients.

### New Organizations Support DOPPS Data Collection

The DOPPS is pleased to announce that DOPPS III data collection efforts will be supported by the **European Dialysis & Transplant Nurses Association–European Renal Care Association** (EDTNA-ERCA) in Europe and by the **Institute for Health Outcomes and Process Evaluation Research** (iHope International) in Japan. The EDTNA-ERCA, headquartered in Paris, has dedicated seven of its experienced members to work as lead clinical research associates (CRAs) to help coordinate DOPPS data collection in Europe. The new CRAs are all dialysis nurses and thus serve as both a knowledgeable resource and an important link between the DOPPS Coordinating Center (DOPPS CC) and European DOPPS study sites. During the first months in their new role, the CRAs have already proved to be invaluable in communicating with study coordinators and medical directors throughout Europe.

Similarly, **iHope International**, a not-for-profit organization based in Tokyo and Kyoto, serves as a liaison between Japanese DOPPS III facilities and the DOPPS CC. iHope will work closely with the DOPPS CC to manage data collection, data collection training, and day-to-day operations in Japan.

## DOPPSLink: The New Online DOPPS Data Collection System

Programmers at URREA have developed an international Web-based data collection system called DOPPSLink for use in DOPPS III. The DOPPSLink system will be implemented in November 2005 in Japan and will be made available in other countries as soon as possible.

The new system can be accessed from any computer with an Internet connection and a current Web browser using a password and user ID provided by the DOPPS Coordinating Center. Questionnaires will be available in any of eight languages (Dutch, English, French, German, Italian, Japanese, Spanish, and Swedish). The data collected are encrypted using industry-standard techniques and tools to ensure both privacy and protection. An example of a DOPPSLink screen is shown in **Figure 5**.

Electronic data collection offers many benefits to DOPPS study coordinators, including time savings and management efficiency. Using DOPPSLink, study coordinators can log in securely, complete questionnaires online, and see their study progress in real time. Code sheets are replaced by drop-down boxes, which eliminate the need for writing and the possibility of misreading. Default values can be set at each facility for elements such as date format, units of measure, and currency, making data entry more efficient. At any time, study coordinators can review relevant historical information, including patients' vascular access history, hospitalizations, and medications. In addition, DOPPSLink enables real-time patient selection, eliminating the step of sending forms to the DOPPS Coordinating Center for selection; this will expedite the process of patient consent.

Study progress can be managed easily through DOPPSLink's task list, which notifies study coordinators of when forms are due. DOPPSLink also features a reporting tool, which allows each facility to immediately view feedback reports that summarize data collected by the facility. In addition, posted announcements on DOPPSLink will help to support and improve communication between the DOPPS Coordinating Center and DOPPS facilities.

As additional facilities begin to use electronic data collection, new functions of DOPPSLink will be added to address DOPPS data collection needs. The DOPPSLink will provide an electronic alternative to paper data entry that will expedite data transfer times as well as data accuracy.

DOPPS Link
Dialysis Outcomes and Practice Patterns Study

Facility ID: 20000 | Home | Tasks | CHC | Announcements | My Account | Online Help | Email DOPPS | Logout | Patient Name Key

Cumulative Hemodialysis Census (CHC)

Add New Patient

Patients Currently Dialyzing: 79
CHC Current as of: 9/20/2005

Show All Patients
Show Current and Recently Departed Patients

| Baseline | Census # | Selected (iPAF) | Consented | Departure | Date of LAST hemodialysis at this facility | Reason left Dialysis Facility | Living Status 2 months after last HD | Date of Death if known |
|---|---|---|---|---|---|---|---|---|
| Edit | 6: DypvElUP | | 0 - No | Edit | | -- | -- | |
| Edit | 7: RZQ4Ha6z | iPAF | 1 - Yes | Edit | | 26 - Transferred to another facility not known as satellite/center facility | -- | |
| Edit | 9: f/gPrLCB | iPAF | 1 - Yes | Edit | | -- | -- | |
| Edit | 11: wmeywlE4 | | 0 - No | Edit | | -- | -- | |
| Edit | 12: iD4vGl2s | iPAF | 1 - Yes | Edit | | -- | -- | |
| Edit | 13: z3iR4KB/ | | 1 - Yes | Edit | | -- | -- | |
| Edit | 14: SqDXj0zs | | 0 - No | Edit | | -- | -- | |
| Edit | 15: Stanford | | 0 - No | Edit | 10/26/2004 | -- | -- | |
| Edit | 17: /zJjUfOr | | 0 - No | Edit | 7/15/2002 | 24 - Transferred to a satellite facility | -- | |

**Figure 5:** DOPPSLink, Cumulative Hemodialysis Census

## DOPPS Contributes to NKF "Best Practice" Newsletter

In 2004, URREA and the National Kidney Foundation (NKF) formed a partnership to coordinate and utilize research from the DOPPS for the development and ongoing updates of the evidence-based clinical practice guidelines developed by the NKF's Kidney Disease Outcomes Quality Initiative (K/DOQI). This partnership is driven by a mutual goal of improving standards of care and patient outcomes for the dialysis population. The collaboration has resulted in a regular contribution by DOPPS investigators to the NKF's *Chronic Kidney Disease Best Practice*, a bimonthly newsletter for health care professionals that focuses on defining and addressing practical clinical issues that confront the team on a daily basis. DOPPS investigators and analysts have now contributed nine articles to this publication, each focusing on a different aspect of hemodialysis and patient care.

The series of articles presents data and findings from the DOPPS, including the degree to which K/DOQI guidelines and recommendations are achieved worldwide. Other timely topics have included anemia control, managing iron deficiency, using catheters versus fistulae for vascular access, managing mineral metabolism and bone disease, issues related to nutrition, and a range of topics regarding prescribed medications.

The DOPPS findings reported in these articles are useful in identifying areas for improvement in dialysis practice. For instance, the K/DOQI guidelines recommend a hemoglobin range of 11.0 to 12 g/dL. The DOPPS has reported that patients with very low hemoglobin (<8 g/dL) show a 26% higher risk of mortality than those whose Hgb fell within the guideline range, and that the risk of death was 5% lower for every 1 g/dL higher hemoglobin level. The study also reported that while there have been significant improvements in anemia control, 27% of hemodialysis patients had hemoglobin levels below the recommended range in 2002, indicating the opportunity for further improvement [1].

The DOPPS has welcomed the opportunity to present this information to health care professionals by collaborating with the NKF. While DOPPS research can help identify new areas for guideline development, it also provides supporting evidence for current guidelines by showing significantly better outcomes for patients who adhere to them.

Reference:
1. Pisoni RL, Bragg-Gresham JL, Young EW, Akizawa T, Asano Y, Locatelli F, Bommer J, Cruz JM, Kerr PG, Mendelssohn DC, Held PJ, Port FK. Anemia Management and Outcomes from 12 Countries in the Dialysis Outcomes and Practice Patterns Study (DOPPS). *Am J Kidney Dis*.44:94-111, 2004.

## Publications and Presentations in 2005

To date, DOPPS research results have been published in 48 peer-reviewed articles and in 11 invited publications, with many other manuscripts accepted, submitted, and under development. **Table 5** is a listing of papers published in 2005, several of these are summarized on pages 2-7.

Awareness of the DOPPS continues to grow in the international nephrologic community as the number of DOPPS presentations given throughout the world increases each year. Invited DOPPS symposia were held at four major nephrology conferences in the past year: the European Renal Association - European Dialysis and Transplant Association Congress (ERA-EDTA), the World Congress of Nephrology (ICN-WCN), the National Kidney Foundation (NKF) Clinical Meeting, and the Annual Dialysis Conference (**Table 6**).

**Table 5**: Manuscripts published in 2005 and references to the articles summarized on pages 2-7


- Young EW, Albert JM, Satayathum S, Goodkin DA, Pisoni RL, Akiba T, Akizawa T, Kurokawa K, Bommer J, Piera L, Port FK. Predictors and consequences of altered mineral metabolism: The Dialysis Outcomes and Practice Patterns Study. *Kidney Int* 67:1179-1187, 2005
- Kimata N, Akiba T, Pisoni RL, Albert JM, Satayathum S, Cruz JM, Akizawa T, Andreucci VE, Young EW, Port FK. Mineral metabolism and hemoglobin concentration among hemodialysis patients in the Dialysis Outcomes and Practice Patterns Study (DOPPS). *Nephrol Dial Transplant* 20: 927-35, 2005.
- Mason NA, Baillie GR, Satayathum S, Bragg-Gresham JL, Akiba T, Akizawa T, Combe C, Rayner HC, Saito A, Gillespie BW, Young EW. HMG-coenzyme A reductase inhibitor use is associated with mortality reduction in hemodialysis patients. *Am J Kidney Dis* 45(1): 119-26, 2005.
- Fissell RB, Bragg-Gresham JL, Lopes AA, Cruz JM, Fukuhara S, Asano Y, Brown WW, Keen ML, Port FK, Young EW. Factors associated with “do not resuscitate” orders and rates of withdrawal from hemodialysis in the international DOPPS. *Kidney Int* 68(3):1282-1288, 2005.
- Satayathum S, Pisoni RL, McCullough KP, Merion RM, Wikström B, Levin N, Chen K, Wolfe RA, Goodkin DA, Piera L, Asano Y, Kurokawa K, Fukuhara S, Held PJ, Port FK. Kidney Transplantation and Wait-Listing Rates from the International Dialysis Outcomes and Practice Patterns Study (DOPPS). *Kidney Int* 68(1): 330-337, 2005.
- Pisoni RL, Greenwood RN. Selected lessons learned from the Dialysis Outcomes and Practice Patterns Study (DOPPS). *Contrib Nephrol* 149: 58-68, 2005
- Tadaki F, Inagaki M, Miyamoto Y, Tanaka S-I, Tanaka R, Kakuta T, Saito A. Early hospital readmission was less likely for hemodialysis patients from facilities with longer median length of stay in the DOPPS study. *Hemodialysis International* 9: 23-29, 2005.
- Lopes AA, Albert JM, Young EW, Satayathum S, Pisoni RL, Andreucci VE, Mapes DL, Mason NA, Fukuhara S, Wikström B, Saito A, Port FK. Screening for depression in hemodialysis patients: Associations with diagnosis, treatment, and outcomes in the DOPPS. *Kidney Int* 66:2047-2053, 2004.


**Table 6:** A few of the international DOPPS presentations given in 2005

| Presentation Title | Date | Location |
| --- | --- | --- |
| What Have We Learned from the DOPPS? | 1/27/2005 | Séminaires de la Pitié-Salpetrière, Paris, France |
| Choice of Dialysis for the "Big Patient" | 2/28/2005 | Annual Dialysis Conference, Tampa, Florida |
| NKF-K/DOQI and Beyond: What Are Nurses Doing to Help Attain Quality Improvement Goals? | 4/20/2005 | American Nephrology Nurses Association National Meeting, Las Vegas, Nevada |
| Vascular access: What Did We Learn From the DOPPS? | 4/22/2005 | Quebec Society of Nephrology, Canada |
| Achieving Best Practices to Help Hemodialysis Patients Live Longer and Better Lives | 5/4/2005 | NKF Clinical Meeting, Washington, DC |
| International Time Trends and Outcomes by Guidelines | 5/24/2005 | Hemodialysis Conference, Vicenza, Italy |
| International Practice Patterns | 6/6/2005 | Symposium, ERA-EDTA, Istanbul, Turkey |
| Pruritus, Vascular Access, Cardiovascular and Sexual Dysfunction in Hemodialysis Patients in the DOPPS | 6/15/2005 | Japan Society of Dialysis and Transplantation, Japan |
| Calcium and Phosphorus Control in HD Patients: International Trends and Outcomes | 6/25/2005 | ICN-WCN, Singapore |
| The DOPPS: Practice Patterns' Effect on Patient Outcomes | 9/9/2005 | European Dialysis and Transplant Nurses Association Conference, Vienna, Austria |
| Pruritus, Results from the DOPPS | 9/25/2005 | 3rd International Workshop for the Study of Itch, Heidelberg, Germany |
| Improving Clinical Outcomes for HD Patients in the DOPPS | 11/10/2005 | Symposium, ASN, Philadelphia, Pennsylvania |

## New Members Join the DOPPS Research Team

### Sweden Country Investigator

Early in 2005, a new Country Investigator for Sweden joined the DOPPS investigator team. **Professor Stefan H. Jacobson, MD, PhD,** is the Director of the Department of Nephrology of the Danderyd Hospital and Karolinska Institutet in Stockholm, Sweden. For more than 20 years, Dr. Jacobson has been active in the field of medical research. He has headed the group at the Division of Nephrology and the Department of Medicine at Karolinska Institute since 1990 and has published more than 100 scientific papers in peer-reviewed journals. A former president of the Swedish Society of Nephrology, Dr. Jacobson is a member of many international medical and nephrology organizations. His extensive international medical and research experience make him a wonderful and welcome addition to the team of DOPPS investigators.

Dr. Jacobson replaces Dr. Karl-Goran Prütz, who helped launch the DOPPS in Sweden. Dr. Prütz stepped down as country investigator on the DOPPS to take on new and increasing responsibilities as Medical Director of the Dialysis Department of the University Hospital of Lund. However, Dr. Prütz will continue to be involved in other aspects of the study.

### Vice President of Research, URREA

**Sylvia Ramirez, MD, MPH, MBA,** joined URREA's DOPPS Coordinating Center as Vice President of Research in January 2005. Dr. Ramirez is a pediatric nephrologist and population epidemiologist with more than 15 years of pediatric clinical care, nephrology, and transplant experience both in the United States and internationally. Before joining URREA, she was the Chief of Prevention at the National Kidney Foundation of Singapore (NKFS) for four years. During her tenure there, she spearheaded a new initiative aimed at the prevention of kidney and related diseases, which included implementing a nationwide screening program of 900,000 individuals, developing a database system to capture the clinical information of this large group, and publishing manuscripts on the epidemiology of renal disease in the unique multi-racial Southeast Asian population of Singapore. Her responsibilities at URREA include the advancement of research initiatives in dialysis, pediatric transplantation, and health policy.

DOPPS Country Investigators at the 2005 ERA-EDTA conference in Istanbul, Turkey

**Questions? Contact:**

**DOPPS Coordinating Center, USA**
**Phone: (USA) 800-367-7760**
**E-mail: dopps@urrea.org**

**University Renal Research and Education Association:**
**URREA, 315 W. Huron Street, Suite 260**
**Ann Arbor, MI 48103 USA**