90 to 109 mm Hg) with renal function ranging from normal to severely impaired. Time control data were obtained after administration of vehicle. GFR and ERPF were measured as the clearances of ^{125}I-iothalamate and ^{131}I-hippuran, respectively. Seventeen patients were included (4 with GFR < 30, 5 with GFR 30 to 60, and 8 with GFR > 60 ml/min). Results (median and 95% CI) are expressed as a percentage change. For the single dose these changes are corrected for diurnal variations.

	Pre-treatment	Single dose	Maintenance % change
MAP *mm Hg*	118 (107 to 126)	−8 (−14 to −5)[a]	−11 (−16 to −5)[b]
ERPF *ml/min*	256 (203 to 412)	13 (7 to 19)[a]	10 (3 to 14)[b]
GFR *ml/min*	60 (49 to 94)	2 (−2 to 6)	0 (−7 to 2)
FF	0.23 (0.22 to 0.26)	−11 (−14 to −5)[a]	−12 (−13 to −4)[b]
RVR *dyne · s · cm*$^{-5}$	24 (15 to 47)	−18 (−22 to −13)[a]	−13 (−25 to 0)[b]

[a] $P < 0.01$ vs. pre-treatment, [b] $P < 0.01$ vs. baseline

Treatment with candesartan resulted in a fall in blood pressure. The rise in ERPF and the fall in FF after a single dose was more pronounced in patients with normal GFR as shown by the correlation between initial GFR and percentage change in ERPF and FF (both $P < 0.05$). These results suggest that renal vasodilation was more pronounced in patients with normal renal function. Interestingly, on maintenance treatment, these correlations were absent, indicating that renal vasodilation occurs then both in patients with normal and impaired renal function. No correlations were found between changes in blood pressure and renal hemodynamics. In conclusion, candesartan cilexitil induces renal vasodilation during continued treatment. This can be achieved not only in patients with normal renal function but also in patients with impaired renal function.

Intravenous iron in dialysis patients: Adjust EPO dose? *F.M. van der Sande, E.C.M. van Pampus, K.M.L. Leunissen, and J.N.M. Barendregt, Department of Internal Medicine, Academic Hospital Maastricht, The Netherlands.* The optimal adjustment of recombinant erythropoietin (EPO) dose after initiation of intravenous iron therapy (ivFe), to avoid progressive anemia or polyglobulinemia, is unknown. We performed a prospective randomized trial to study the possibility of reducing the EPO dose after initiation of ivFe in relatively "iron deplete' dialysis patients (serum ferritin < 100 mg/liter or transferrin saturation $< 20\%$). After a run-in period of 3 months, during which iron was administered orally (ferrosi fumaras 0.2 g thrice daily), stable "iron deplete' patients were randomized to receive 0%, 50% or 100% of their original weekly subcutaneous EPO (Eprex, Jansen-Cilag) dose and intravenously 100 mg iron saccharate (Venoferrum, Fresenius) bi-weekly during 3 months. Hematocrit (Hct), ferritin (FER, mg/liter), transferrin saturation (TRS, %) and need for transfusion of packed erythrocytes or adjustment of EPO dose (TRANS, % of group developing severe anemic symptoms and/or having a decline of Hct larger than 0.12 or below 0.25) were measured at least at beginning and end of each period. Pre-transfusion Hct values are reported in transfused patients. During the run-in period the EPO-0% ($N = 7$), the EPO-50% ($N = 10$) and the EPO-100% ($N = 12$) groups were similar regarding age (68 ± 9 years), time on dialysis (3.4 ± 2.7 years), EPO dose (7.5 ± 3.1 kU), Hct (0.33 ± 0.05), FER (61 ± 51), TRS (19 ± 8%) and TRANS (31%). After start of ivFe, FER increased by 120 ± 16, $P < 0.01$ in all groups. TRS increased by 4.0 ± 1.6% in the EPO-0% group and by 4.0 ± 1.8% in the EPO-50% group, both $P < 0.05$, and remained unchanged in the EPO-100% group. TRANS increased by 57% in the EPO-0%, $P < 0.05$, remaining unchanged in the other groups. Hct decreased by 0.04 ± 0.01, $P < 0.05$ in the EPO-50% group. The study indicates that replacement of ferrosi fumaras by intravenous iron saccharate in "iron deplete' hemodialysis patients increases FER and TRS. Reduction of EPO dose at the start of ivFe is ill-advised because it reduces Hct values and increases the need for transfusions within the first 3 months.

Fracture incidence after kidney transplantation. *R. de Sévaux, J. Wetzels and A. Hoitsma, Department of Nephrology, University Hospital, Nijmegen, The Netherlands.* Several long-term complications occur after successful kidney transplantation. One of these is corticosteroid-induced osteoporosis, resulting in fractures. Retrospectively we determined the fracture incidence in our patients as follows: all patients with good graft function transplanted before January 1st, 1988, were sent a questionnaire and their medical records were studied. We asked for the occurrence of fractures after transplantation, the existence of osteoporosis and a possible therapy for osteoporosis. A total of 292 patients were identified (165 men, 127 women). The mean age at transplantation for men was 35 years (range 4 to 69 years) and for women 36 years (range 5 to 61). Two hundred and sixteen questionnaires (74%) were returned, 284 medical records were reviewed (98%). In this way we obtained data on 290 of 292 patients. The mean duration of follow-up for men was 13 years (range 8 to 27 years) and for women 14 years (range 8 to 25 years). Sixty-eight fractures occurred in 43 patients (17 men, 26 women); in most of the cases there was only a minor or no trauma. Fractures were situated in leg/ankle/foot (25× in 20 patients), arm/wrist/hand (23× in 16 patients), ribs (6× in 6 patients), pelvis (2× in 2 patients), vertebrae (in 10 patients), sternum (1×) and clavicle (1×). In half of the cases, the first fracture occurred within 5 years after transplantation. Fractures occurred significantly more often in women ($P < 0.02$). The time on dialysis before, and the cumulative dose of corticosteroids in the first 3 months after transplantation did not differ between man or women with or without a fracture. Women with one or more fractures were transplanted at a significant older age (42 vs. 35 years; $P < 0.05$) and were significantly older at the moment of follow-up than women without fractures (55 vs. 48 years; $P < 0.05$); the duration of follow-up was 14 years in both groups. Fractures were confirmed radiologically; in 19/43 patients signs of osteoporosis were seen on these radiographs. In 9 of these 19 patients densitometry was performed; 8 of them indeed had osteoporosis and were intermittently treated for osteoporosis. In the whole group of 292 patients, 28 were treated for osteoporosis; 14 of them had fractures before this treatment. Our conclusions are: 15% of our patients experienced one or more fractures after kidney transplantation and there is an apparent correlation with osteoporosis.

Prediction of overhydration in hemodialysis (HD) patients by measuring blood pressure response to Valsalva maneuver. *D.J.W. van Kraaij, I.H. Go, M.M.J. Schuurmans, R.W.M.M. Jansen, W.H.L. Hoefnagels, Department of Internal Medicine, Canisius-Wilhelmina Hospital and Department of Geriatric Medicine, University Hospital Nijmegen, Nijmegen, The Netherlands.* Distinct correlations between the systolic blood pressure ratio during a pressure-monitored Valsalva maneuver and pulmonary wedge pressure have been demonstrated previously. We performed non-invasive blood pressure measurements (Finapres^{R}) during Valsalva maneuvers in 15 patients on chronic HD, and compared the use of this procedure in identifying overhydrated HD patients with four other methods. During the five-week study period, 5 patients experienced an episode of overhydration, necessitating medical intervention. Compared are predialysis means of pre- vs. post-overhydration periods in 5 overhydrated patients (I), and of 5 overhydrated patients vs. 10 controls (II).

Method	*P* values[a] I ($N = 5$)	II ($N = 15$)
Blood pressure ratio during Valsalva	0.025	0.032
Composite clinical assessment score[b]	0.051	0.006
Weight deviation of target dry weight	0.121	0.436
Central venous pressure	0.355	0.159
Extracellular fluid volume[c]	1.000	0.327

[a] Wilcoxon rank sum test

[b] Composed by an experienced nephrologist, including evaluation of thirst, dry mouth, dizziness, muscle cramps, decreased skin turgor, dyspnea, orthopnea, elevated central venous pressure, pulmonary rales and edema

[c] Bio-electrical conductivity measurements

Only blood pressure ratios and clinical assessment scores correlated well ($r = 0.70$, $P = 0.004$) in all patients. In conclusion, assessment of the blood pressure response to a Valsalva maneuver appears to be a useful additional tool to identify overhydrated HD patients and to evaluate the effect of treatment interventions in such patients.