

# Anemia, malnutrizione e insufficienza renale nell’anziano

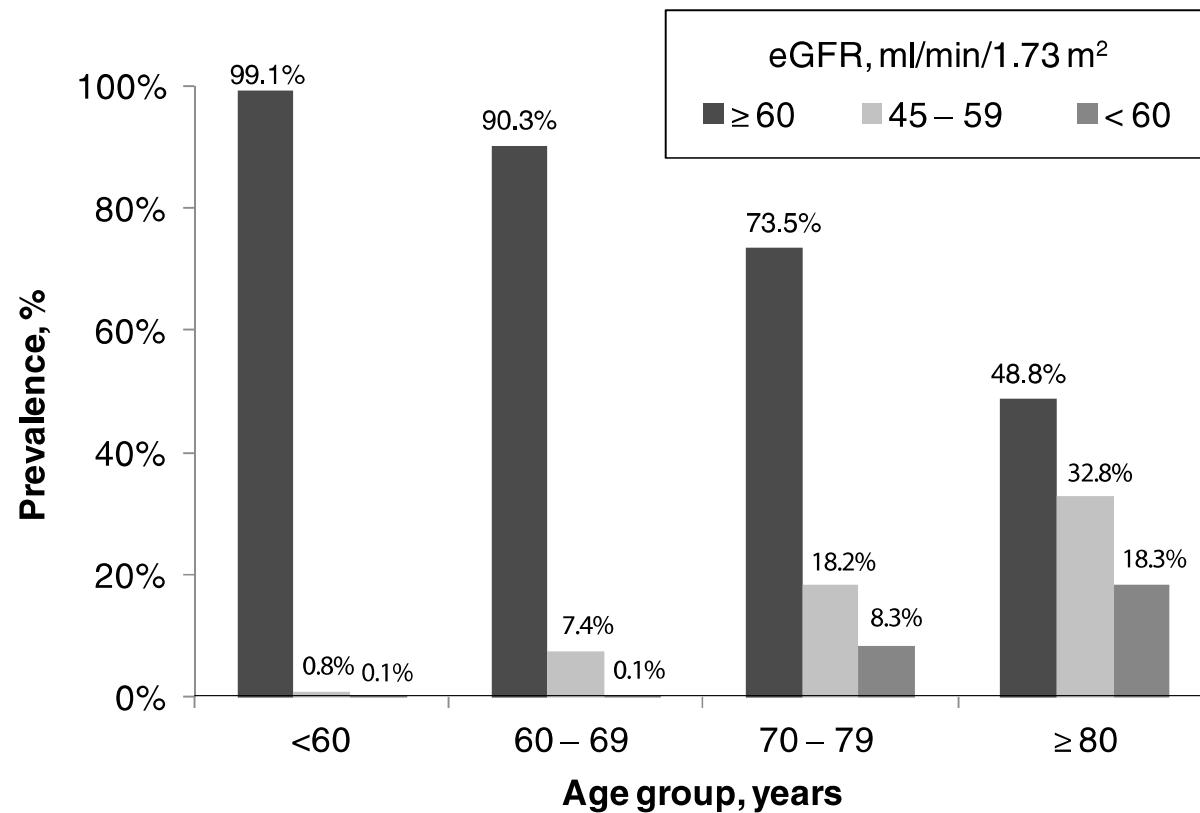
Raffaele Antonelli Incalzi

Università Campus Bio-Medico

Roma

# CKD, a geriatric disease

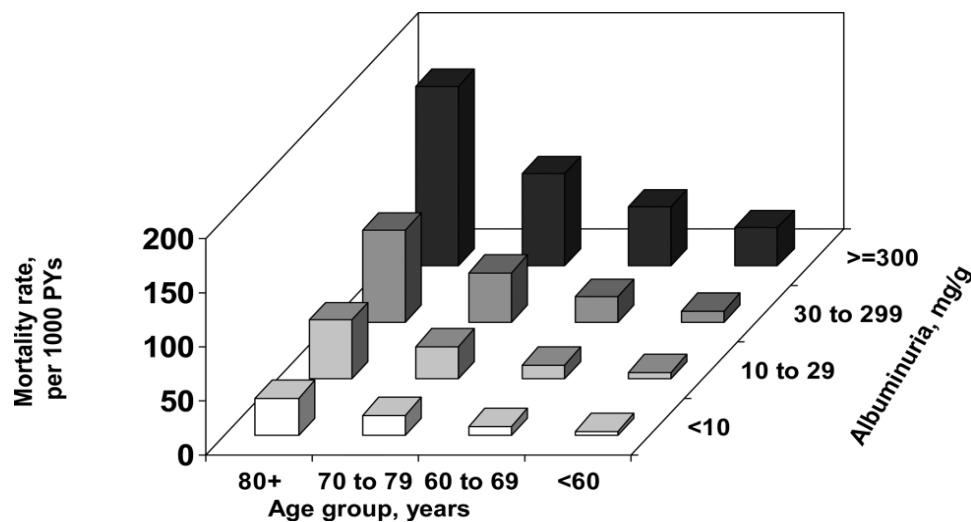
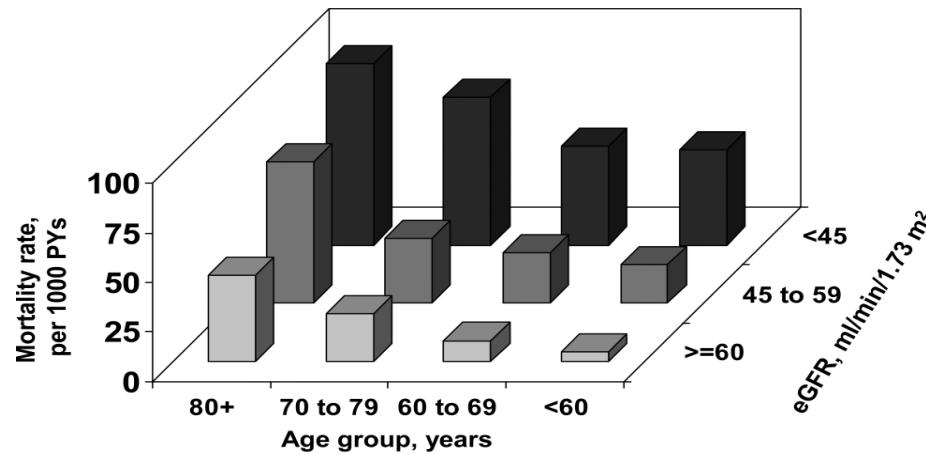
(Barrett Bowling C et al. *J Gerontol A Biol Sci Med Sci.* 2012; 67: 1379 )



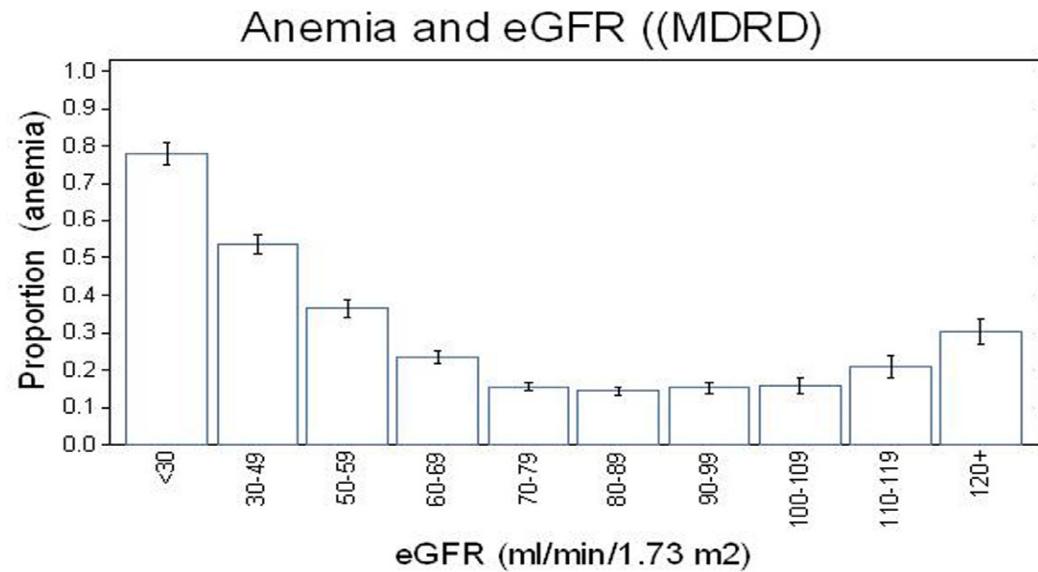
# ...and not a normal age-related event

(Barrett Bowling C et al. J

*Gerontol A Biol Sci Med Sci. 2012; 67: 1379* )



# The GFR-Anemia relationship (Isakow E et al. *Annals of Clinical & Laboratory Science* 2014; 44: 419)



# Prevalence of anemia by CKD stage (Stauffer ME et al. LOS ONE | January 2014 | Volume 9 | Issue 1 | e84943)

**Table 3.** Prevalence of anemia.

	N	Weighted percentage	95% CI	Projected number in US
With CKD	410	15.4	13.1–18.2	$4.8 \times 10^6$
Stage 1	57	8.4	5.5–12.4	$0.6 \times 10^6$
Stage 2	68	12.2	9.2–16.0	$0.9 \times 10^6$
Stage 3	231	17.4	13.7–21.8	$2.7 \times 10^6$
Stage 4	37	50.3	37.2–63.4	$0.5 \times 10^6$
Stage 5	17	53.4	34.1–71.7	$0.2 \times 10^6$
Without CKD	729	6.3	5.3–7.4	$11 \times 10^6$

**Table 3. CKD classification with risk assessment.**

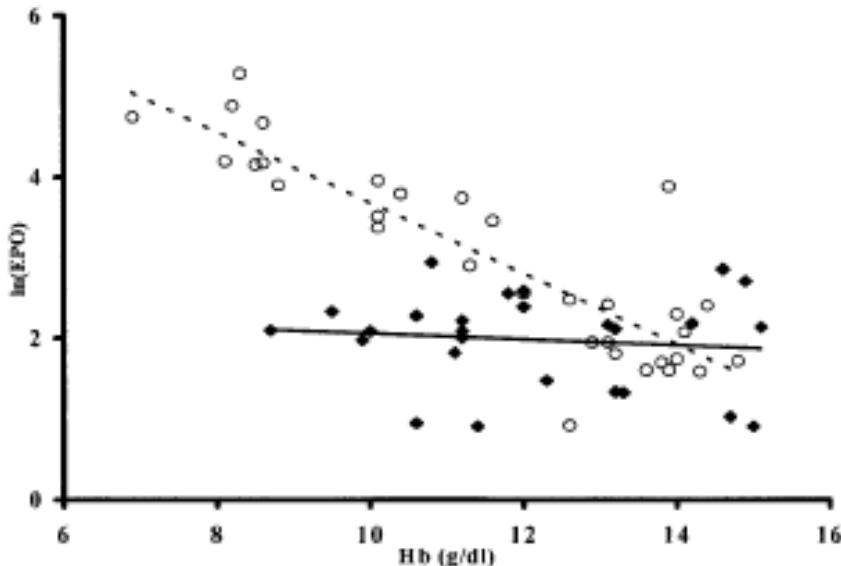
GFR (Glomerular Filtration Rate, ml/min/1.73m <sup>2</sup> )		ACR (Albumin to creatinine ratio, mg/mmol)			Increasing risk
		A1	A2	A3	
High/normal>90	G1	<3 Normal to mildly increased	3-30 Moderately increased	>30 Severely increased	Increasing risk
Mild reduction related to normal range for a young adult <b>60–89</b>	G2				
Mild-moderate reduction <b>45–59</b>	G3a				
Moderate-severe reduction <b>30–44</b>	G3b				
Severe reduction <b>15–29</b>	G4				
Kidney failure <b>&lt;15</b>	G5				
<b>Increasing risk</b>					

# Anemia With Erythropoietin Deficiency Occurs Early in Diabetic Nephropathy

DEBORAH R. BOSMAN, MBBS<sup>1</sup>  
ANDREA S. WINKLER, MBBS<sup>1</sup>  
JOANNE T. MARSDEN, PhD<sup>2</sup>

IAIN C. MACDOUGALL, MD<sup>3</sup>  
PETER J. WATKINS, MD<sup>1</sup>

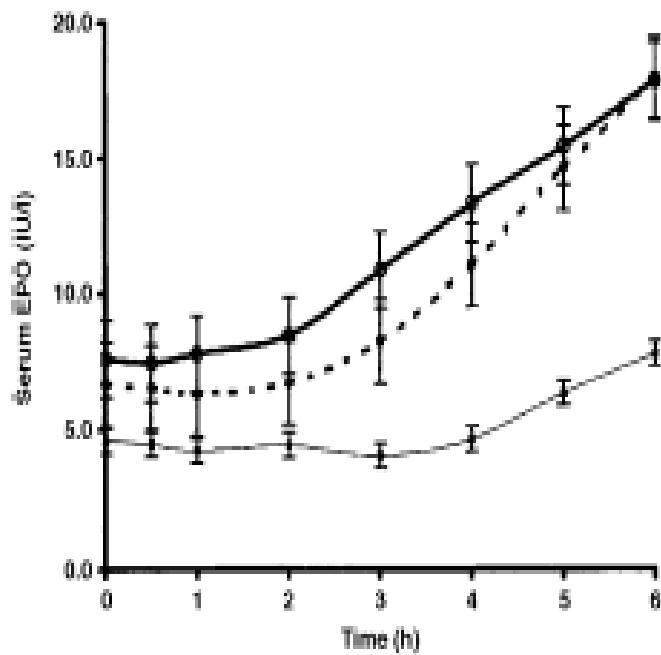
*Diabetes Care* 24:495–499, 2001



# Erythropoietin response to hypoxia in patients with diabetic autonomic neuropathy and non-diabetic chronic renal failure

D. R. Bosman, C. A. Osborne\*, J. T. Marsden†, I. C. Macdougall‡, W. N. Gardner\* and P. J. Watkins

Diabet. Med. 19, 65–69 (2002)



# Renal function and energy intake in people >50 y (Luiss D et al. Br J Nutr 2014; 111: 2184)

**Table 2.** Total energy and energy-adjusted macronutrient intake according to the quartiles of estimated glomerular filtration rate (eGFR) in 1087 elderly men  
(Median values and interquartile ranges (IQR))

n...	Quartiles of eGFR (range, ml/min per 1.73 m <sup>2</sup> )								P for trend*	
	Q1 (111.1–70.2) 272		Q2 (70.1–61.4) 272		Q3 (61.3–52.9) 271		Q4 (52.8–10.5) 272			
	Median	IQR	Median	IQR	Median	IQR	Median	IQR		
Parameters										
Energy intake (kJ)	7284.8	6131.6–8578.0	7346.3	6150.9–8789.3	7103.2	5915.3–8151.7	7085.2	5847.1–8222.8	0.022	
Energy intake/IBW (kJ/kg)	107.5	90.4–125.1	107.1	91.2–125.9	103.7	86.2–120.9	102.5	86.2–119.2	0.013	
Raw fat intake (g/d)	66.0	54.2–81.5	67.5	52.8–84.1	65.2	50.5–78.1	65.4	52.2–78.6	0.179	
Fat intake, % of energy (g/d)	33.9	30.5–37.1	34.4	30.8–38.1	33.8	30.7–37.4	34.1	31.3–37.7	0.651	
Raw carbohydrate intake (g/d)	203.1	170.9–245.5	201.8	169.3–247.5	197.7	161.5–273.6	197.0	160.8–239.2	0.030	
Carbohydrate intake, % of energy (g/d)	47.5	44.2–51.6	47.3	43.9–51.3	48.3	44.2–51.7	47.3	43.6–50.6	0.631	
Raw protein intake (g/d)	66.7	57.1–78.4	65.1	55.6–75.6	63.1	54.1–72.5	63.1	54.9–74.5	0.012	
Protein intake, % of energy (g/d)	15.7	14.3–16.9	15.2	14.1–16.8	15.5	14.2–16.7	15.7	14.1–17.1	0.974	

Q, quartile; IBW, ideal body weight.

\* P for trend determined using the Jonckheere–Terpstra test.

# Renal function and energy intake in people >50 y

(Luiss D et al. Br J Nutr 2014; 111: 2184)

**Table 3.** Multivariable regression models predicting total energy intake, after normalisation by ideal body weight (kJ/kg per d)

	Energy intake (per SD) Standardised coefficients	P
Continuous model*		
eGFR (per SD)	0.064	0.047
Regular physical activity	0.141	0.012
Smoking	-0.083	0.008
Hypertension	-0.104	0.001
Hyperlipidaemia	-0.063	0.045
Dichotomous model*†		
eGFR < 60 ml/min per 1.73 m <sup>2</sup>	-0.066	0.038
Regular physical activity	0.145	0.009
Smoking	-0.086	0.006
Hypertension	-0.103	0.001
Hyperlipidaemia	-0.062	0.049

eGFR, estimated glomerular filtration rate.

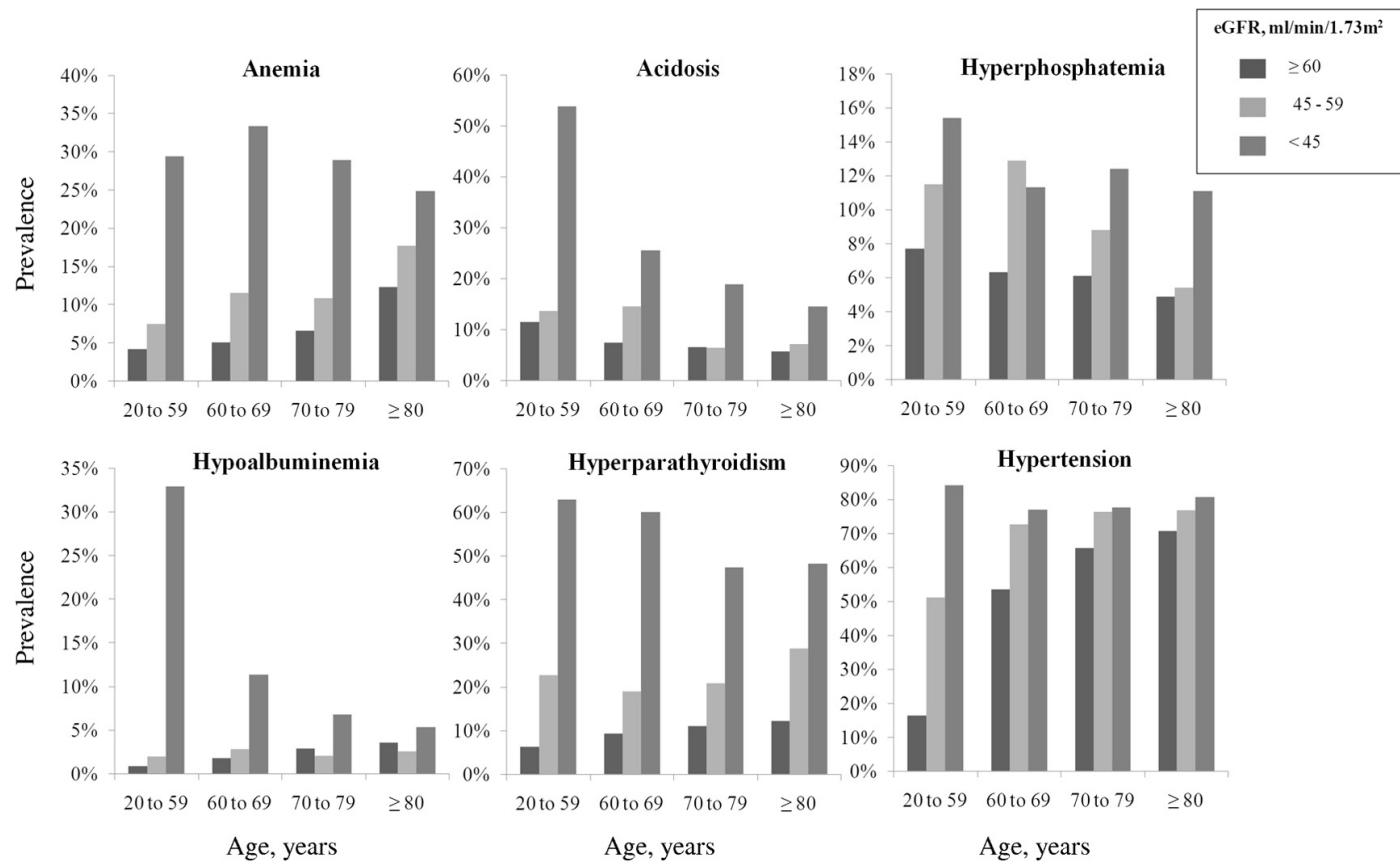
\* Models were adjusted for age, smoking status, physical activity, education, CVD, diabetes, hypertension, hyperlipidaemia and urinary albumin excretion rate.

† For kidney function, eGFR > 60 ml/min per 1.73 m<sup>2</sup> was taken as a reference.

# The link between CKD and malnutrition

- Retention of anorexigenic mediators
- Chronic inflammation
- Suppressed parasympathetic activity
- Uncharacterised uraemic toxicity
- Uraemic gastritis
- Slow digestion

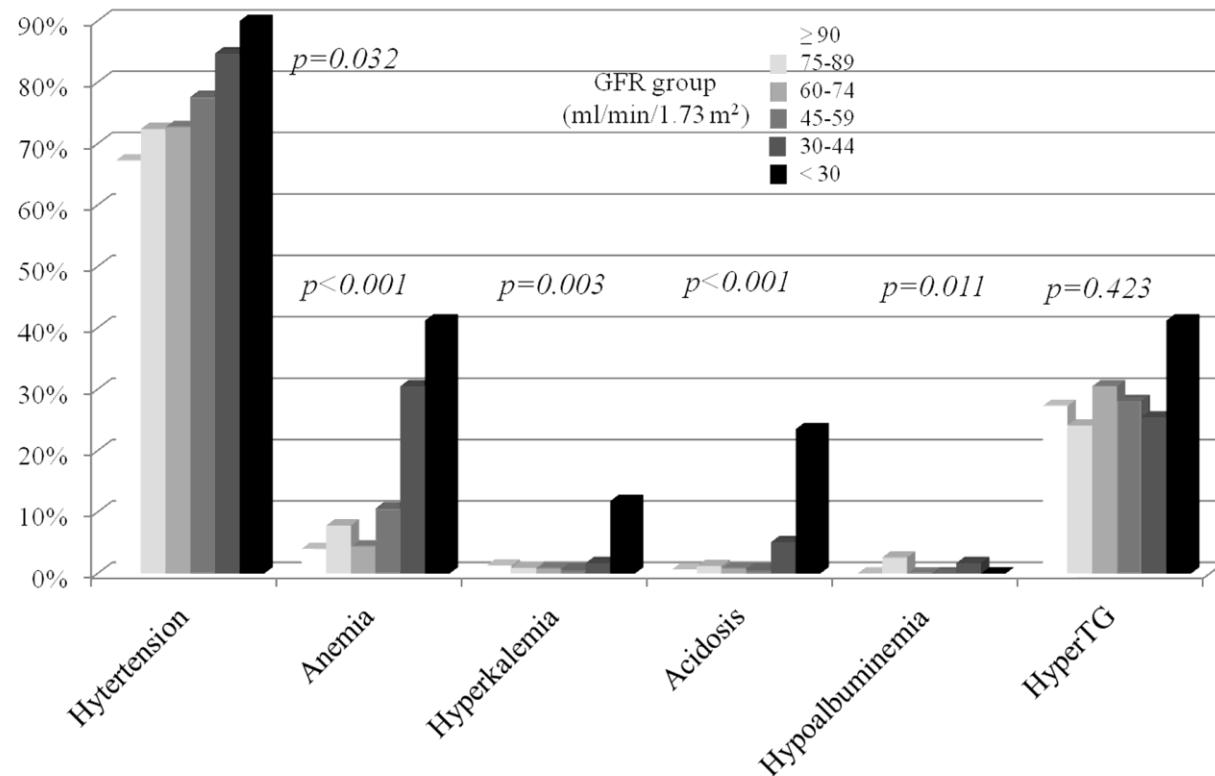
# CKD and its complications as a function of age: the variant behaviour of hypoalbuminemia (Barrett Bowling C et al. Clin J Am Soc Nephrol 2011; 6: 2822)



# CKD and its complications as a function of age: the variant behaviour of hypoalbuminemia (Ahn SY et al. PLOS ONE

1 December 2013 | Volume 8 | Issue 12 | e84467)

Figure 2.



# PTH: the strongest correlate of anemia

**Table 2** Multiple regression analysis with serum hemoglobin concentration as the dependent variable in patients as a whole

	Unstandardized coefficients B	Std. error	t	p	95.0 % confidence interval for B	
					Lower	Upper
Age	-0.01	0.02	-0.79	0.433	-0.05	0.02
Gender	-0.77	0.48	-1.60	0.116	-1.74	0.20
Diabetes	-0.11	0.48	-0.22	0.824	-1.08	0.87
GFR	0.00	0.01	0.07	0.947	-0.02	0.02
PTH <sup>a</sup>	-2.12	0.73	-2.91	0.005	-3.59	-0.66
Serum calcium	-0.02	0.41	-0.05	0.957	-0.84	0.79
Serum phosphorus	-0.50	0.33	-1.54	0.131	-1.16	0.16
TSAT	0.03	0.03	0.98	0.332	-0.03	0.08
Albumin	0.17	0.50	0.35	0.731	-0.84	1.18
Cholesterol	0.01	0.01	2.00	0.051	0.00	0.02
PCR <sup>a</sup>	-0.57	0.66	-0.86	0.395	-1.89	0.76

Due to presence of collinearity log-ferritin, fibrinogen, homocysteine, BMI were excluded from the final model

*GFR* glomerular filtration rate (as 24/h measured creatinine clearance), *PTH* parathyroid hormone, *PCR* C-reactive protein, *TSAT* transferrin saturation

<sup>a</sup> Log transformed variable

# PTH and anemia in CKD: a marker of tubular dysfunction or a direct erythrosuppressor? (Russo D et al. J Nephrol 2015; 28:701)

- Meytes D, Bogin E, Ma A, Dukes PP, Massry SG (1981) Effect of parathyroid hormone on erythropoiesis. *J Clin Invest* 67:1263–1269
- Dunn CDR, Trent D (1981) The effect of parathyroid hormone on erythropoiesis in serum free cultures of fetal mouse liver cells. *Proc Soc Exp Biol Med* 166:556–561
- Bogin E, Massry SG, Levi J, Djaldeti M, Bristol G, Smith J (1982) Effect of parathyroid hormone on osmotic fragility of human erythrocytes. *J Clin Invest* 69:1017–1025
- 
- 9. Kalantar-Zadeh K, Lee GH, Miller JE et al. Predictors of hyporesponsiveness to erythropoiesis-stimulating agents in hemodialysis patients. *Am J Kidney Dis* 2009; 53: 823–834
- 11. Rao DS, Shih M-S, Mohini R. Effect of serum parathyroid hormone and bone marrow fibrosis on the response to erythropoietin in uremia. *N Engl J Med* 1993; 328: 171–175
- 12. Zingraff J, Drüeke T, Marie P et al. Anemia and secondary hyperparathyroidism. *Arch Int Med* 1978; 138: 1650–1652
-

# PTH and anemia in CKD: an effect of increased PTH or decreased vitamin D?

- Lac PT, Choi K, Liu IA et al. The effects of changing vitamin D levels on anemia in chronic kidney disease patients: a retrospective cohort review. *Clin Nephrol* 2010; 74: 25.
- Sim JJ, Lac PT, Liu IL et al. Vitamin D deficiency and anemia: a cross- sectional study. *Ann Hematol* 2010; 89: 447.

# Risposta all'EPO: potenziale ruolo del PTH (Sudhaker Rao D et al. New Engl J Med 1993; 328: 175)

**Table 1. Characteristics of 18 Patients Undergoing Hemodialysis Who Received Long-Term Erythropoietin Therapy.\***

CHARACTERISTIC	GOOD RESPONSE (N = 11)	POOR RESPONSE (N = 7)
Age (yr)	57±10	49±16
Duration of dialysis (yr)	6.0±4.3	7.3±3.7
Serum creatinine (mg/dl)	16.3±3.2	16.2±2.9
Serum urea nitrogen (mg/dl)	67±13	73±16
Erythropoietin (U/kg, 3×/wk)	56±18	174±33

\*Plus-minus values are means ± SD. To convert values for creatinine to micromoles per liter, multiply by 88.4. To convert values for urea nitrogen to millimoles per liter, multiply by 0.357.

# PTH e risposta all'EPO

(Sudhaker Rao D et al. New Engl J Med 1993; 328: 175)

**Table 3. Serum Biochemical Values in 18 Patients Undergoing Hemodialysis Who Received Long-Term Erythropoietin Therapy.\***

VARIABLE	GOOD RESPONSE (N = 11)	POOR RESPONSE (N = 7)
Calcium (mg/dl)	9.9±0.9 (8.5–11.4)	10.0±0.6 (9.4–11.2)
Phosphate (mg/dl)	6.4±3.5 (3.3–10.9)	7.2±2.7 (3.2–10.4)
25-Hydroxyvitamin D (ng/ml)	37±15 (16–60)	35±10 (23–53)
1,25-Dihydroxyvitamin D (pg/ml)	8±3 (5–14)	9±7 (5–27)
Aluminum (μg/dl)	24±12 (5–40)	13±10 (3–31)
Alkaline phosphatase (U/liter)	130±132 (52–517)	296±220† (75–563)
Parathyroid hormone (pg/ml)	266±322 (23–985)	800±648‡ (42–1653)

\*Plus-minus values are means ± SD. Data in parentheses are ranges. To convert values for calcium to millimoles per liter, multiply by 0.249; for phosphate, multiply by 0.323. To convert values for 25-hydroxyvitamin D to nanomoles per liter, multiply by 2.496. To convert values for 1,25-dihydroxyvitamin D to picomoles per liter, multiply by 2.368; for parathyroid hormone, multiply by 0.105. To convert values for alkaline phosphatase to microkatalys per liter, multiply by 0.017.

†P = 0.06 for the comparison with the good-response group.

‡P = 0.03 for the comparison with the good-response group.

# L'equivalente istomorfometrico della risposta all'EPO

(Sudhaker Rao D et al. New Engl J Med 1993; 328: 175)

**Table 4. Bone Histomorphometric Findings in 18 Patients Undergoing Hemodialysis Who Received Long-Term Erythropoietin Therapy.\***

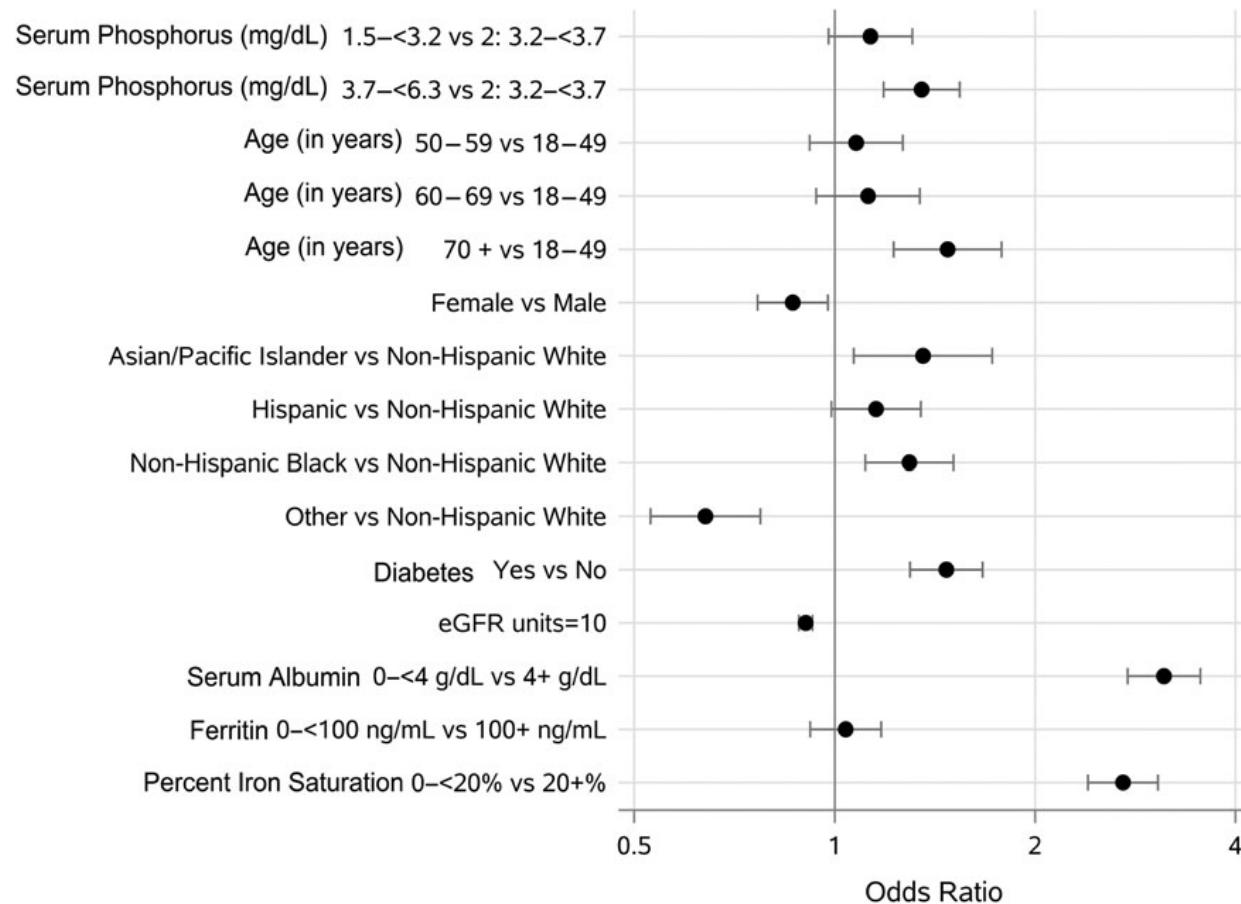
VARIABLE	GOOD RESPONSE (N = 11)	POOR RESPONSE (N = 7)
Osteoid volume (%)	<b>9.2±4.1</b> (1.1–15.8)	<b>14.4±8.4</b> (3.8–28.1)
Osteoid surface (%)	<b>56±19</b> (12–79)	<b>63±18</b> (32–86)
Osteoid thickness ( $\mu\text{m}$ )	<b>10.6±2.4</b> (5.9–13.9)	<b>14.8±5.5</b> (7.4–24.7)
Bone aluminum (% of osteoid surface)	<b>10.4±11.8</b> (0–29)	<b>12.8±29.8</b> (0–80)
Osteoclast surface (% of nonosteoid surface)	<b>3.1±2.6</b> (0.2–7.2)	<b>8.7±7.8†</b> (0.2–25.1)
Marrow fibrosis (%)	<b>1.1±1.1</b> (0–3.1)	<b>15.6±16.4‡</b> (0.2–39.9)
Eroded surface (%)	<b>5.0±2.6</b> (1.7–9.5)	<b>10.2±5.2‡</b> (3.7–16.6)

\*Plus-minus values are means  $\pm$  SD. Data in parentheses are ranges.

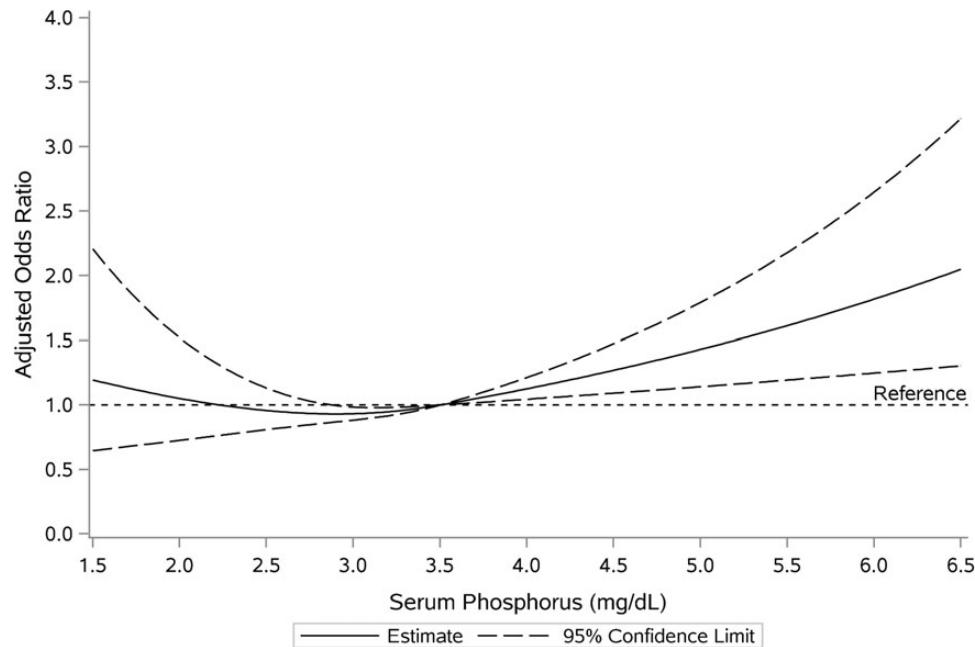
†P = 0.04 for the comparison with the good-response group.

‡P = 0.009 for the comparison with the good-response group.

# Hyperfosphatemia and anemia: a causal or collateral link? (Tran L et al. Nephrol Dial Transplant 2015; 0: 1)



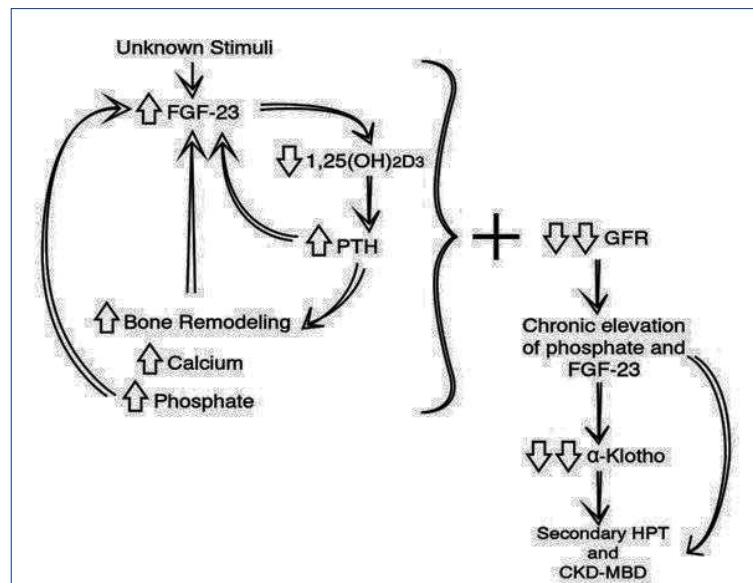
# Hyperfosphatemia and anemia: a causal or collateral link? (Tran L et al. Nephrol Dial Transplant 2015; 0: 1–10 )



# Putative mechanisms of Phosphorus erythrotoxicity

- Higher polyamines production> myelotoxicity (Kovesdy CP et al. Transplantation 2011; 91: 875–882)
- High [P]> vascular calcification within the renal arteries> erythropoietin deficiency and anemia (Kuroo M. Clin Calcium 2014; 24: 1785–1792)
- High [P]> decreased vitamin D synthesis> hypocalcemia> elevated PTH , which directly inhibits erythropoiesis, induce hemolysis and cause bone marrow fibrosis in CKD [Bogin E et al. J Clin Invest 1982; 69: 1017–1025; Meytes D et al. J Clin Invest 1981; 67: 1263–1269)
- High [P]> increased [FGF-23]> suppression of klotho (Krajisnik T et al Kidney Int 2010; 78: 1024–1032 ). In murine models, low klotho levels are associated with poor outcomes including early senescence, cell toxicity, premature aging and vascular calcifications.

# The putative role of FGF-23 (Diniz H et al. Nefrologia 2013;33:835-44 )



# Phosphate overload directly induces systemic inflammation and malnutrition as well as vascular calcification in uremia

(Yamada S et al.

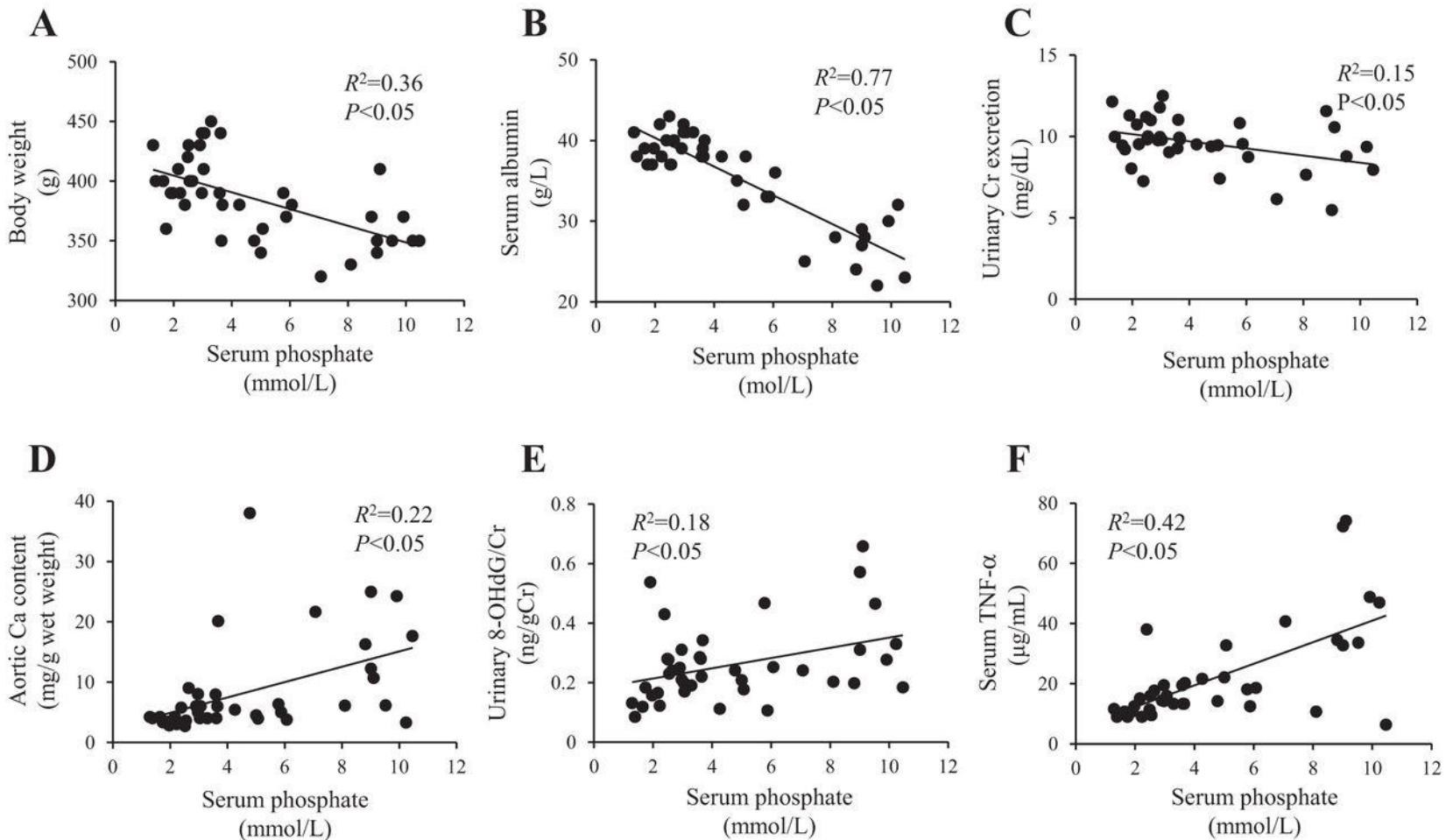
Am J Physiology - Renal Physiology 2014; 306: F1418)

Content of the animal diets

Group	Ca2+, %	Pi, %	Protein	Lactose	Adenin	Lanthanum Carbonate, %
CNT	1.0	1.2	19% (grain based)	0	0	0
CKD-LP	1.0	0.3	19% (casein based)	20	0.3	0
CKD-MP	1.0	0.6	19% (casein based)	20	0.3	0
<b>CKD-HP</b>	1.0	0.9	19% (casein based)	20	0.3	0
<b>CKD-EP</b>	1.0	1.2	19% (casein based)	20	0.3	0
CKD-LaC	1.0	1.2	19% (casein based)	20	0.3	6

On day 1, rats were randomly subdivided into the following six groups, and each group was fed one of the specific diets for 8 wk (until day 56): control rats (CNT group; 1.2% Pi,  $n = 10$ ), CKD rats fed a low-Pi diet (CKD-LP group; 0.3% Pi,  $n = 10$ ), CKD rats fed a moderate-Pi diet (CKD-MP group; 0.6% Pi,  $n = 10$ ), CKD rats fed a high-Pi diet (CKD-HP group; 0.9% Pi,  $n = 12$ ), CKD rats fed an extremely high-Pi diet (CKD-EP group; 1.2% Pi,  $n = 14$ ), and CKD rats fed an extremely high-Pi diet and 6% lanthanum carbonate (CKD-LaC group; 1.2% Pi,  $n = 10$ ). Diets in the CKD groups contained 0.3% adenine.

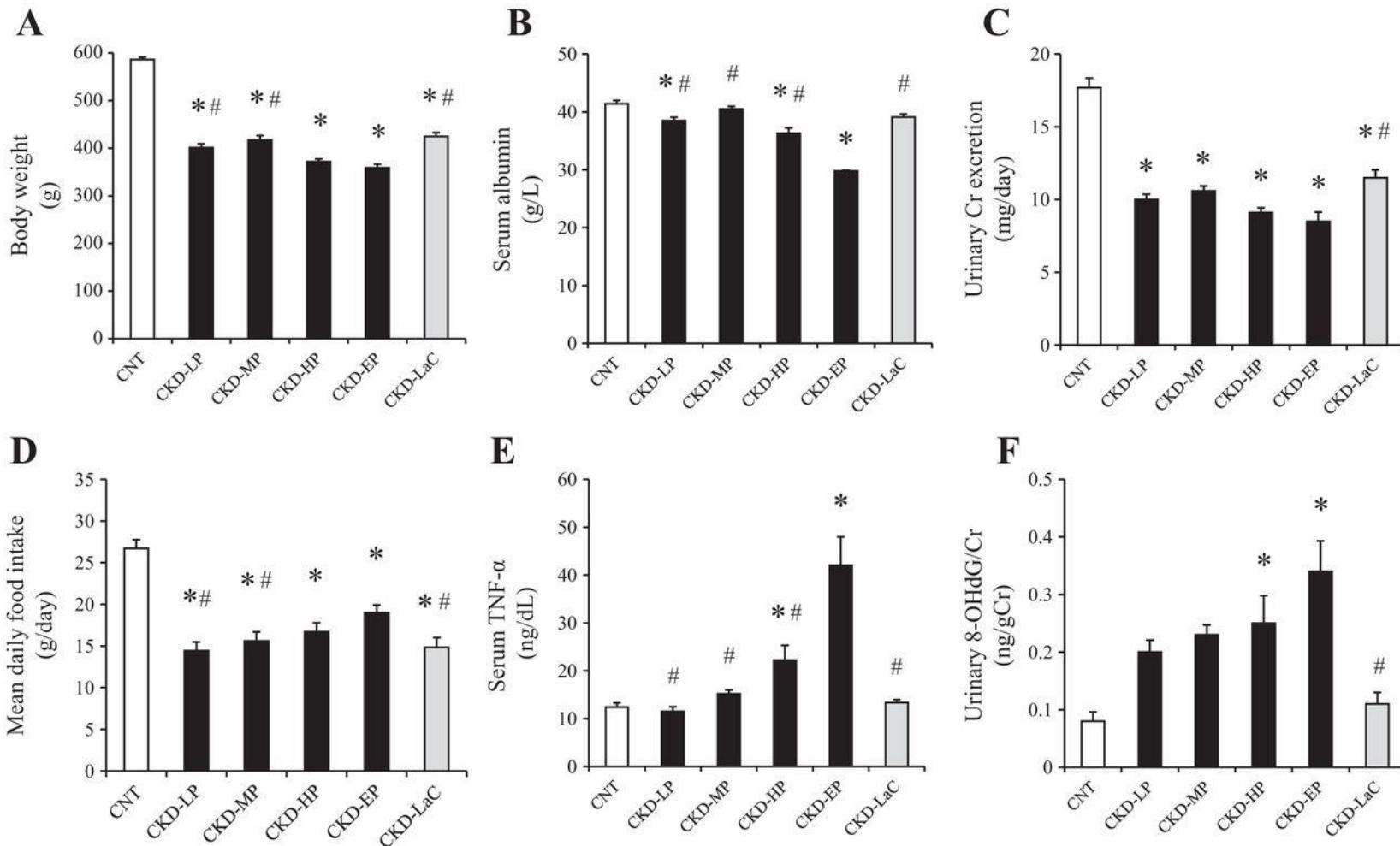
# Correlations between serum Pi and components of malnutrition-inflammation-atherosclerosis (MIA) syndrome.



Shunsuke Yamada et al. Am J Physiol Renal Physiol  
2014;306:F1418-F1428

AMERICAN JOURNAL OF PHYSIOLOGY  
Renal Physiology

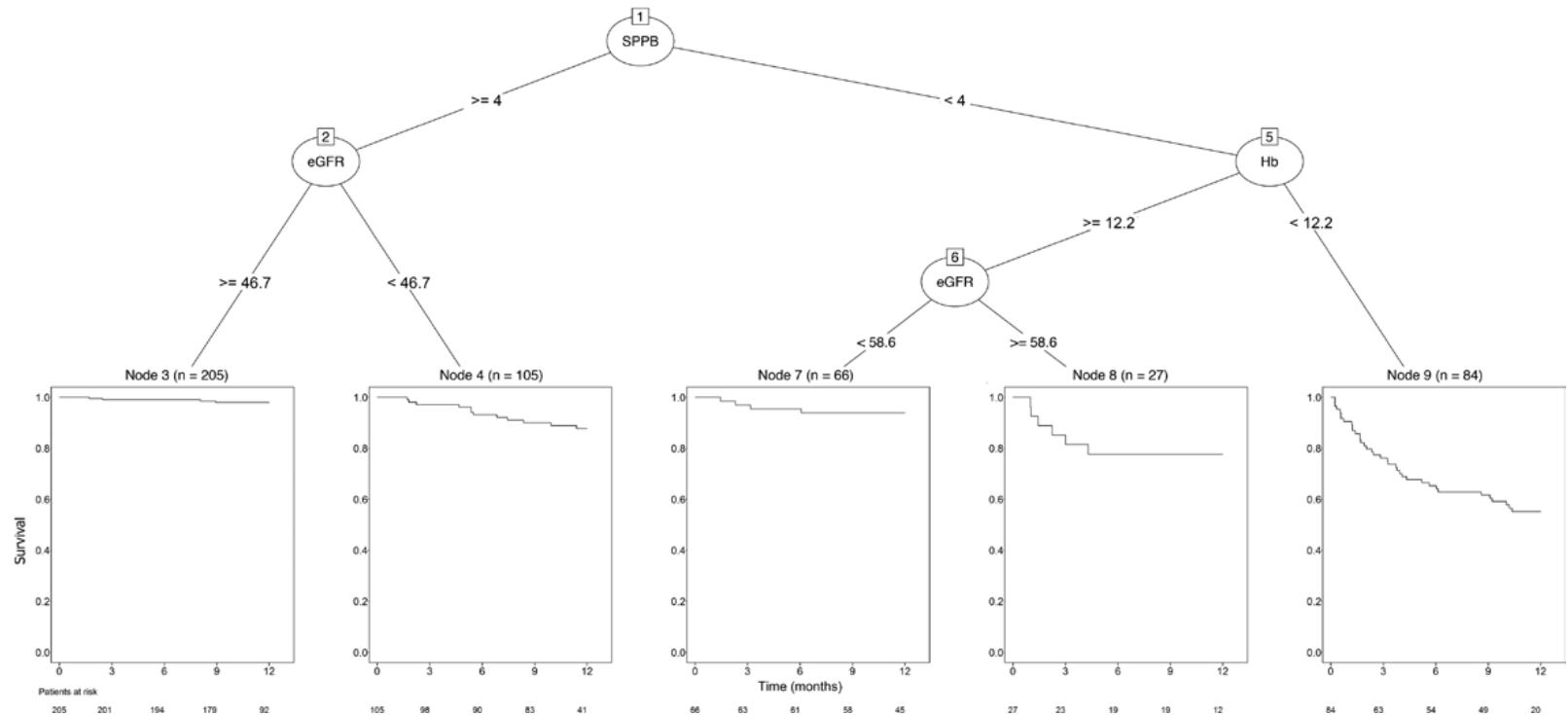
# Effects of dietary Pi loading on nutritional status and systemic inflammation and oxidative stress markers.



Shunsuke Yamada et al. Am J Physiol Renal Physiol  
2014;306:F1418-F1428

AMERICAN JOURNAL OF PHYSIOLOGY  
Renal Physiology

# The frailty-eGFR-Hb prognostic interaction (Lattanzo F et al. J Gerontol: MEDICAL SCIENCES, 2015, 1–8 )



# We refer to a largely concealed disease

(Tuot DS et al. Clin J Am Soc Nephrol 2011; 6: 838)

**Table 2. Odds ratios for awareness of CKD by abnormal levels of individual clinical markers of CKD in the US population, NHANES 1999 to 2008**

	Odds Ratios for Awareness of CKD (95% CI) <sup>a</sup>	Odds Ratios for Awareness of CKD, Independent of estimated GFR (95% CI) <sup>b</sup>
Albuminuria <sup>c</sup>	5.46 (3.10 to 9.60)	4.00 (2.11 to 7.39)
Hyperkalemia (serum potassium, >5.0 mEq/L)	2.63 (1.32 to 5.18)	1.56 (0.86 to 2.83)
Hyperphosphatemia (serum phosphorus, >4.5 mEq/L)	1.41 (0.67 to 2.95)	1.10 (0.54 to 2.26)
Anemia (hemoglobin <12.5 g/dl in women, 13.5 g/dl in men)	1.56 (0.98 to 2.50)	1.03 (0.59 to 1.81)
Acidosis (serum bicarbonate, <22 mEq/L)	1.11 (0.72 to 1.72)	0.94 (0.60 to 1.45)
Elevated blood urea nitrogen (>15 mmol/L)	1.05 (0.58 to 1.90)	0.62 (0.30 to 1.23)
Uncontrolled hypertension (>140/>90 mmHg)	0.65 (0.26 to 1.67)	0.50 (0.14 to 1.78)

Analyses have been weighted to reflect the US population. CKD, chronic kidney disease; CI, confidence interval.

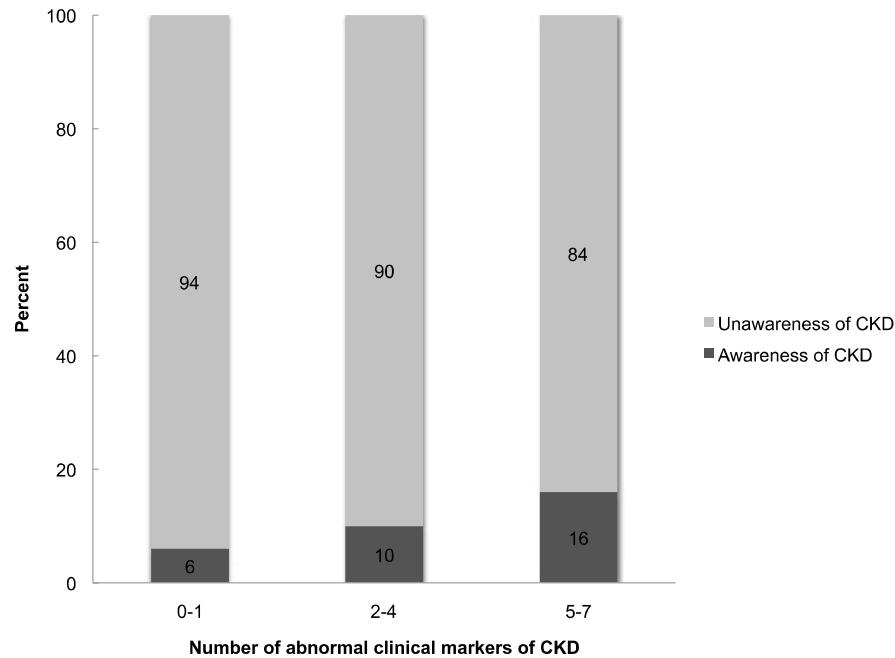
<sup>a</sup>Adjusted for other manifestations listed and age, gender, race/ethnicity, education, income, and diabetes.

<sup>b</sup>Adjusted for everything in previous model and estimated GFR.

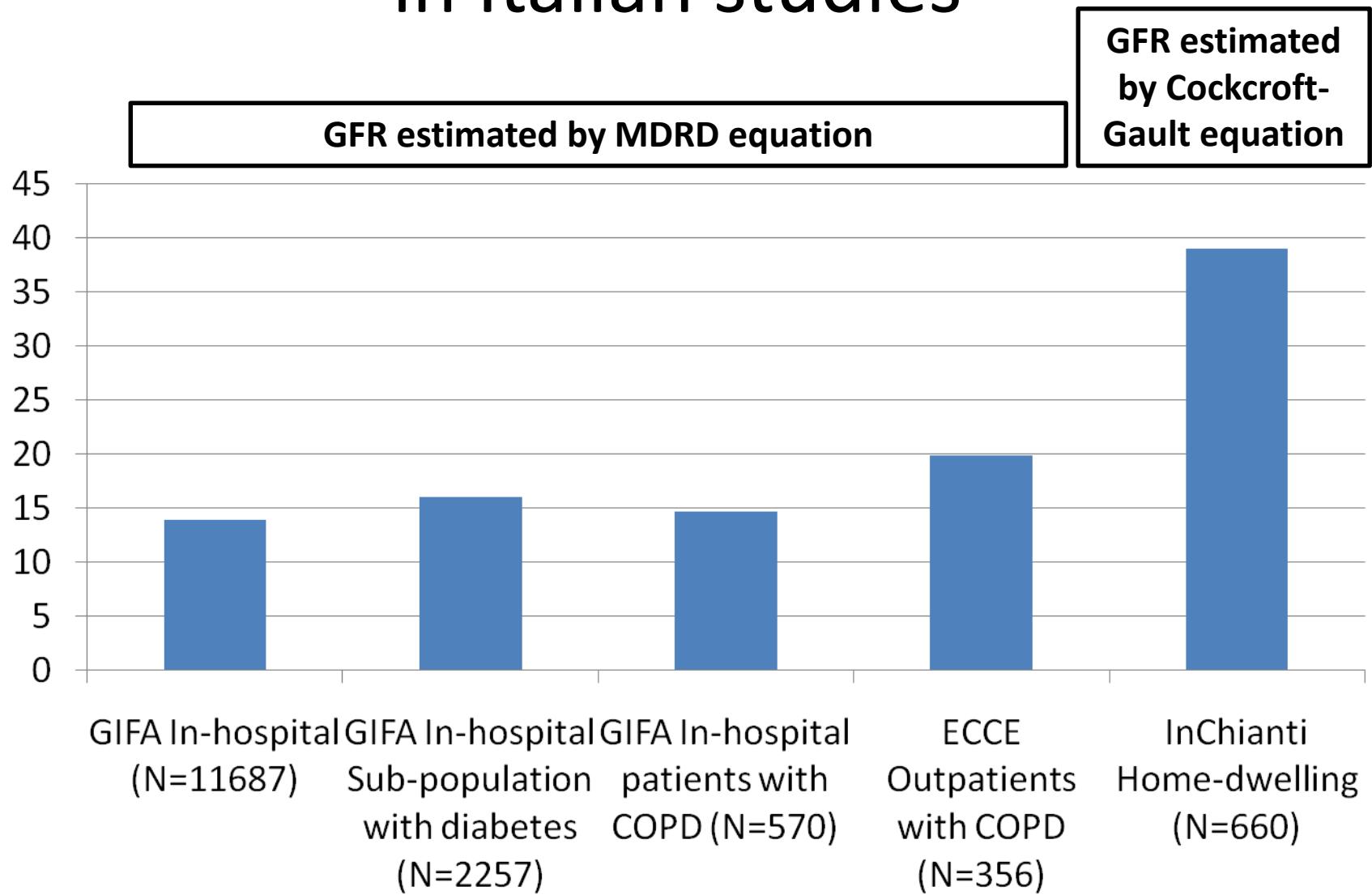
<sup>c</sup>Albuminuria is defined as urinary albumin-to-creatinine ratio >17 mg/g in men and >25 mg/g for women.

# Only a minority of CKD patients is aware of being a CKD patient

(Tuot DS et al. Clin J Am Soc Nephrol 2011; 6: 838)

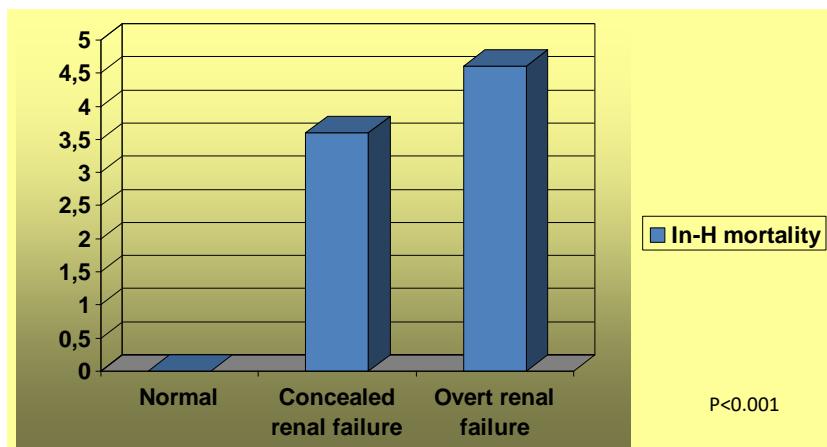
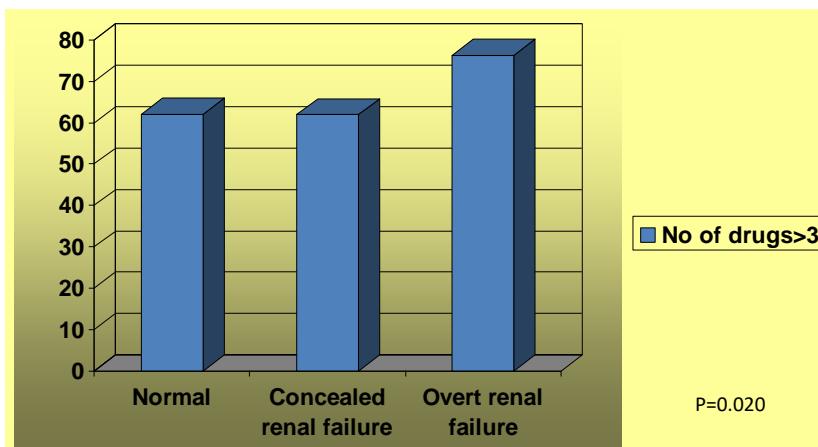
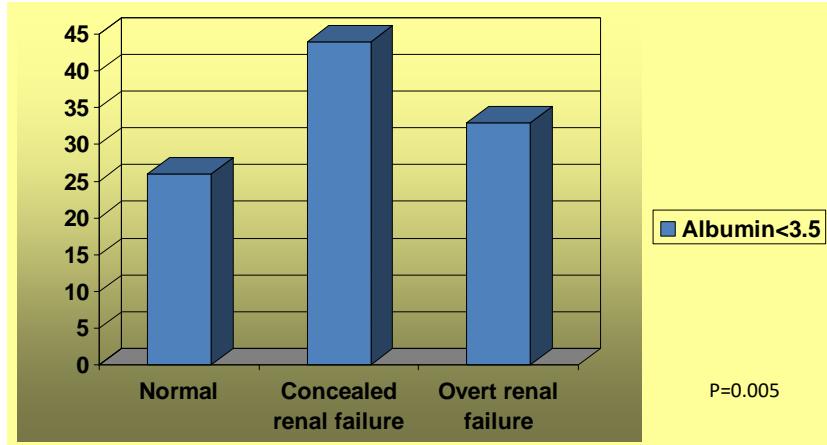
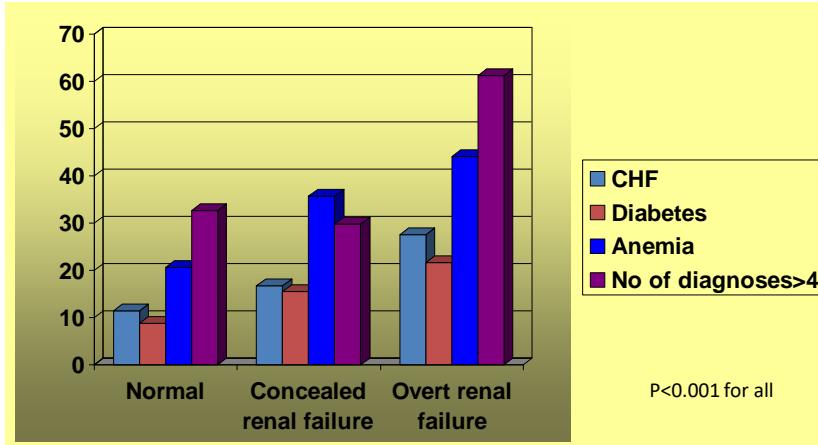


# Prevalence of concealed renal failure in Italian studies



# Gruppo Italiano di Farmacovigilanza nell'Anziano

## Surveys 1993-1998 (COPD, N=570)



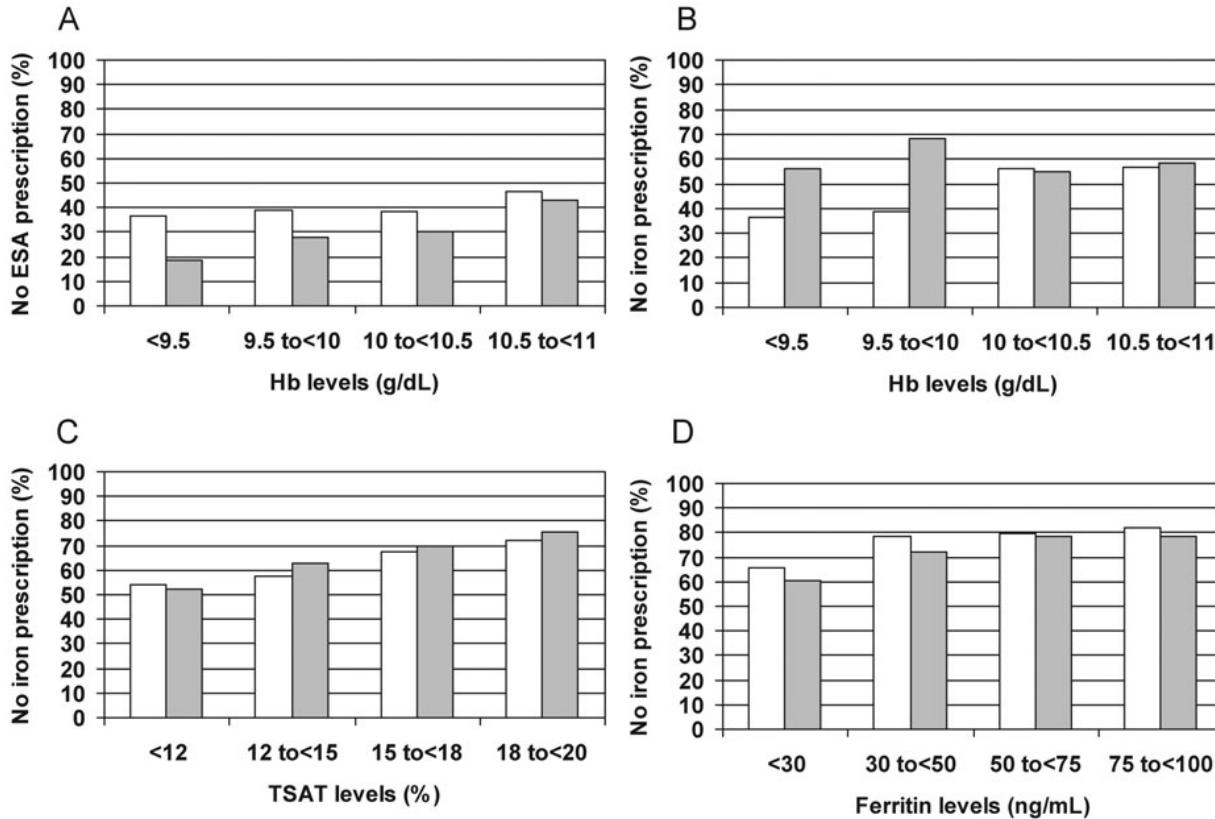
# Correlates of concealed and overt renal failure in an elderly population

Antonelli Incalzi R et al. Chest 2010; 137: 831

**Table 4—Backward Stepwise Logistic Regression Models of Selected Variables to Concealed or Overt Renal Dysfunction vs Normal Renal Function**

Variables	OR	95% CI
<b>Concealed renal dysfunction<sup>a</sup></b>		
Age, y (for each 1-y increase)	1.06	1.04-1.09
COPD	2.19	1.17-4.12
Serum albumin < 3.5 g/dL	2.83	1.70-4.73
Muscle-skeletal disease	1.78	1.01-3.16
Diabetes	1.96	1.02-3.76
<b>Overt renal dysfunction<sup>b</sup></b>		
Age, y (for each 1-y increase)	1.06	1.04-1.10
BMI	1.05	1.01-1.10
COPD	1.94	1.01-4.66
Diabetes	2.25	1.26-4.03

Even in tertiary nephrological clinics there is considerable inertia vs Iron and ESA prescription (Minutolo R et al. Nephrol Dial Transplant 2013; 28: 3035)



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ORIGINAL ARTICLE

# Assessment of the geriatric competence and perceived needs of Italian nephrologists: an internet survey

Filippo Aucella<sup>1</sup> · Giuliano Brunori<sup>2</sup> · Michela Dalmatello<sup>3</sup> · Dario Leosco<sup>4</sup> ·  
Giuseppe Paolisso<sup>5</sup> · Martino Marangella<sup>6</sup> · Giovanni Battista Capasso<sup>7</sup> ·  
Raffaele Antonelli Incalzi<sup>8</sup>

**Table 1** The geriatric questionnaire for nephrologists: questions are intended to explore the routine approach to elderly patients with known or supposed renal problems

1	What percentage of your patients are over 75 years of age?	<30 % (5 %)	30–49 % (26.1 %)	50–69 % (46.3 %)	>70 % (19.2 %)
2	In your opinion, is older age an exclusion criterion for dialysis treatment?	No (97 %)	Yes (1.5 %)	Don't know (1.5 %)	
3	Do you collaborate with geriatricians in the management of very old patients?	Frequently (13.1 %)	Sometimes (27.9 %)	Rarely (22 %)	Never (11.3 %) No access to geriatricians (25.8 %)
4	Do you assess cognitive and mental health with a detailed test?	Frequently (8 %)	Sometimes (18.1 %)	Rarely (25.2 %)	Never (29.1 %) I don't know about this kind of tool (19.6 %)
5	Do you assess functional ability with a detailed test?	Frequently (8.0 %)	Sometimes (18.7 %)	Rarely (24.0 %)	Never (27.0 %) I don't know about this kind of tool (22.3 %)
6	Do you use a comprehensive geriatric assessment for prognostic purposes?	Frequently (3.6 %)	Sometimes (6.2 %)	Rarely (11 %)	Never (38.6 %) I don't know about this kind of tool (39.8 %)
7	In older patients with refractory CHF with APE, which dialysis modality do you prefer?	Hemodialysis (86.9 %)	Peritoneal dialysis (11.0 %)	Unknown (2.1 %)	
8	In older patients with refractory CHF which dialysis modality do you prefer?	Hemodialysis (34.7 %)	Peritoneal dialysis (60.8 %)	Unknown (4.5 %)	
9	In geriatric patients do you use diuretics?	Frequently (66.5 %)	Sometimes (30.6 %)	Rarely (2.7 %)	Never (0.3 %)
10	And mineralcorticoid receptor antagonists?	Frequently (11.9 %)	Sometimes (54.3 %)	Rarely (27.9 %)	Never (5.9 %)
11	And ACEi? (%)	46.0	44.5	8.3	1.2
12	And ARB? (%)	40.1	48.4	10.4	1.2
13	How do you assess the presence and degree of osteoporosis in the elderly?	DXA (26.4 %)	X-ray (9.0 %)	QCT (8.0 %)	QUS (7.1 %) Does not assess (48.4 %)

CHF congestive heart failure, APE acute pulmonary edema, ACEi angiotensin-converting-enzyme inhibitors, ARB angiotensin II receptor blockers, DXA dual-energy X-ray absorptiometry, QCT quantitative computed tomography, QUS quantitative ultrasound

# ASSESSING NEPHROLOGICAL COMPETENCE AMONG GERIATRICIANS: A PROOF OF CONCEPT INTERNET SURVEY. (ANTONELLI INCALZI R ET AL. PLoS One. 2015 Nov 3;10(11):e0141388)

Table 1. The Nephrological Questionnaire for Geriatricians.

1)	Do you systematically assess GFR? 71.5%			
2)	In the event of a confirmatory answer to question 1:			
	Through the creatinine clearance: 8%		Through MDRD: 45.5%	Through Cockcroft-Gault: 65%
3)	Do you routinely check the following parameters?			
	Urine[Na]: 25%	Urine[N]: 19%	Urine[P]: 16%	Serum OH—Vitamin D: 30%
4)	Do you routinely perform 24 hour urine collection? 69%			
5)	At which CKD stage do you refer your patient to the nephrologist?			
	CKD 2: 5.4%	CKD 3a: 16.2%	CKD 3b: 34.7 %	CKD 4: 32.9% CKD 5: 10.8%
6)	Do you think that EPO supplementation is useful to your patients? 90.3%			
7)	Do you usually prescribe D vitamin to your patients? 78.8%			
8)	In the event of a confirmatory answer to question 7, which kind of D vitamin form do you prescribe?			
	Cholecalciferol: 61.4%	25(OH)D3 calcidiol: 24.1%	Calcitriol: 23.1%	Other: 1.4%
9)	Do you usually check the albumin to creatinine ratio on spot urine sample? 12%			
10)	Do you usually order renal US scan? 74.4%			
11)	Do you use a standardized protocol to prevent the contrast induced nephropathy? 31%			
12)	How do you rate your adherence to nephrological guidelines (from 1, the lowest, up to 5, the highest)?			
	1: 3. 1 % 2. 12%	3. 67.4%	4: .4 26 % 5. 1.2%	

# Anemia, malnutrizione e insufficienza renale nell’anziano: conclusioni

- Relazioni complesse fra i tre termini
- Molteplici carenze alimentari potenzialmente implicate nella genesi dell’anemia
- Interazioni tra metabolismo fosfocalcico ed eritropoiesi
- Indispensabile una reale VMD e una terapia “comprehensive”