

Ein Abgesang auf die Gefährlichkeit des Akuten Nierenversagens nach Kontrastmittelgabe?

Offenlegung: Seit 16 Jahren Berater für „renal safety“ der Bayer AG



Prof. Dr. med. Pontus B. Persson

Gibt es PC-AKI überhaupt?

Entire Paired Population

		AKI (Noncontrast Scans)	
		Yes	No
AKI (Contrast Scans)	Yes	22 0.5%	172 4.0%
	No	187 4.4%	3884 91.1%

McNemar: $\chi^2 = 0.63, p = .43$

First Scan: Contrast Exam

		AKI (Noncontrast Scans)	
		Yes	No
AKI (Contrast Scans)	Yes	14 0.6%	95 4.3%
	No	116 5.2%	1992 89.9%

McNemar: $\chi^2 = 2.09, p = .15$

First Scan: Noncontrast Exam

		AKI (Noncontrast Scans)	
		Yes	No
AKI (Contrast Scans)	Yes	8 0.4%	77 3.8%
	No	71 3.5%	1892 92.4%

McNemar: $\chi^2 = 0.24, p = .62$

McDonald et al. Radiology 2015

Die schwedische Registerstudie



<http://www.kidney-international.org>

original article

© 2006 International Society of Nephrology

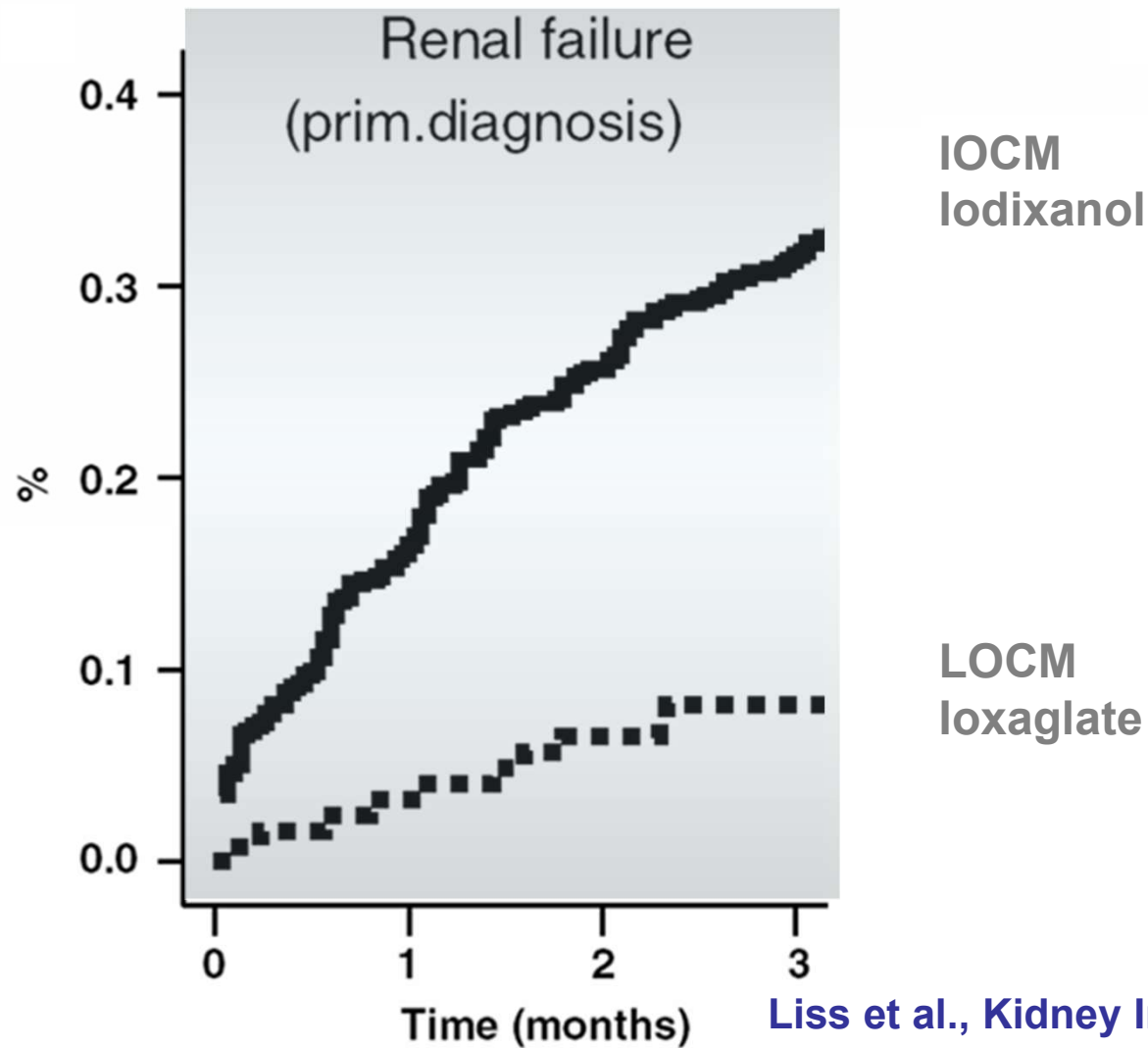
Renal failure in 57 925 patients undergoing coronary procedures using iso-osmolar or low-osmolar contrast media

P Liss^{1,5}, PB Persson^{2,5}, P Hansell³ and B Lagerqvist⁴

¹Institute of Radiology, University of Uppsala, Uppsala, Sweden; ²Institute of Physiology, Humboldt University Berlin, Berlin, Germany;

³Institute of Medical Cell Biology, University of Uppsala, Uppsala, Sweden and ⁴Department of Cardiology, Uppsala University Hospital, Uppsala, Sweden

Die schwedische Registerstudie

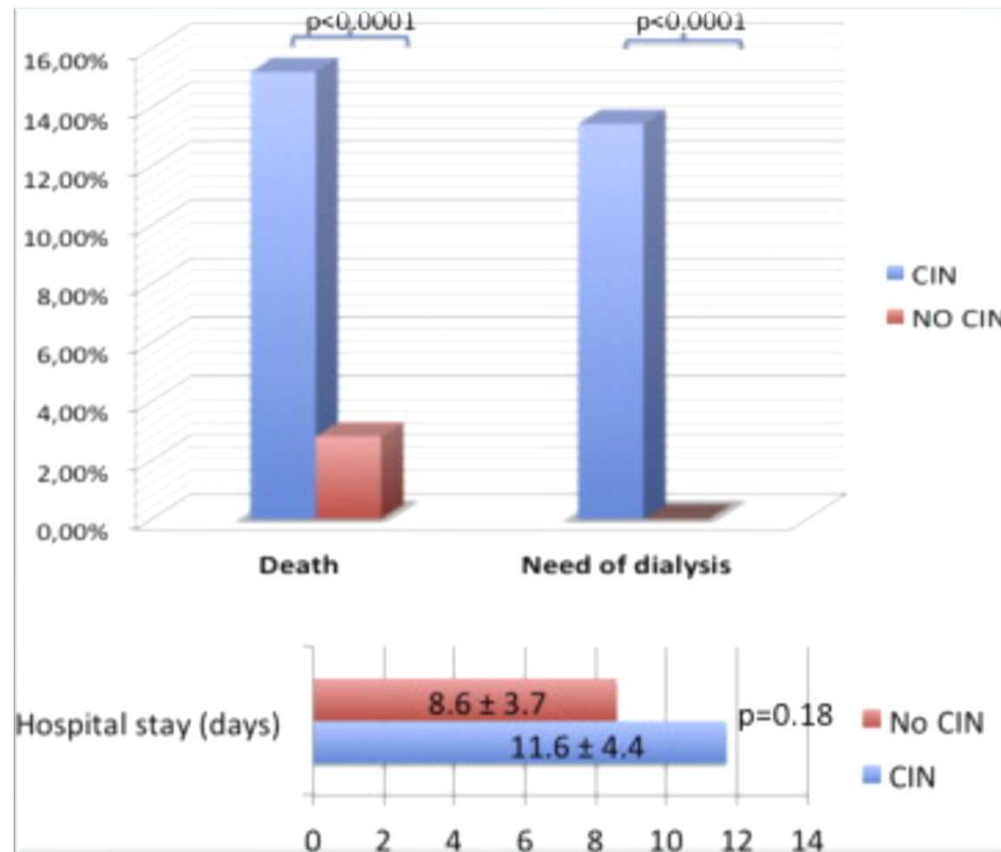


Gibt es PC-AKI überhaupt?

- The risk of AKI from CM, ... has been exaggerated ...the risk is likely nonexistent in patients with normal renal function.

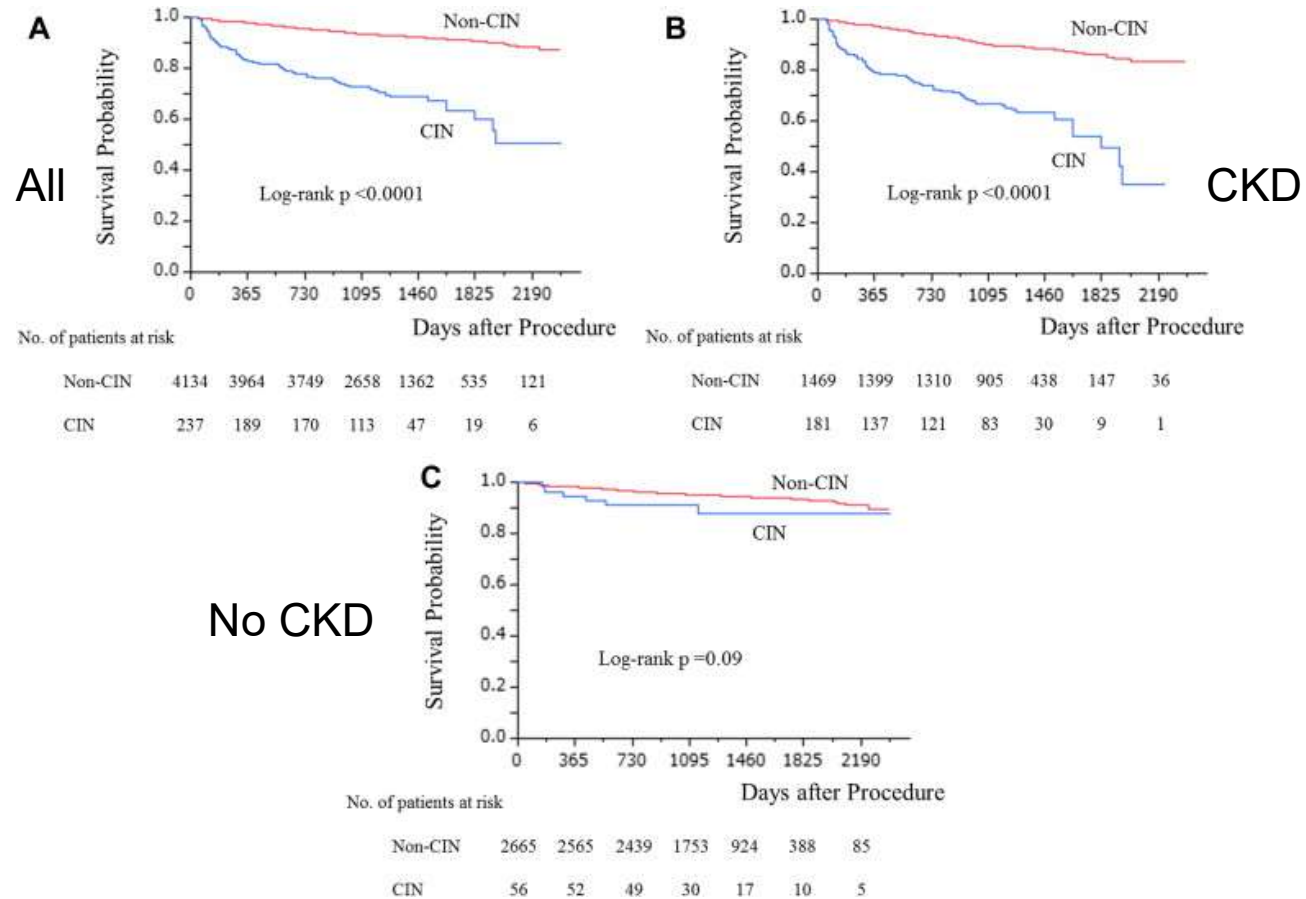
Wichmann et al. Circulation 2015

Bedeutung von PC-AKI



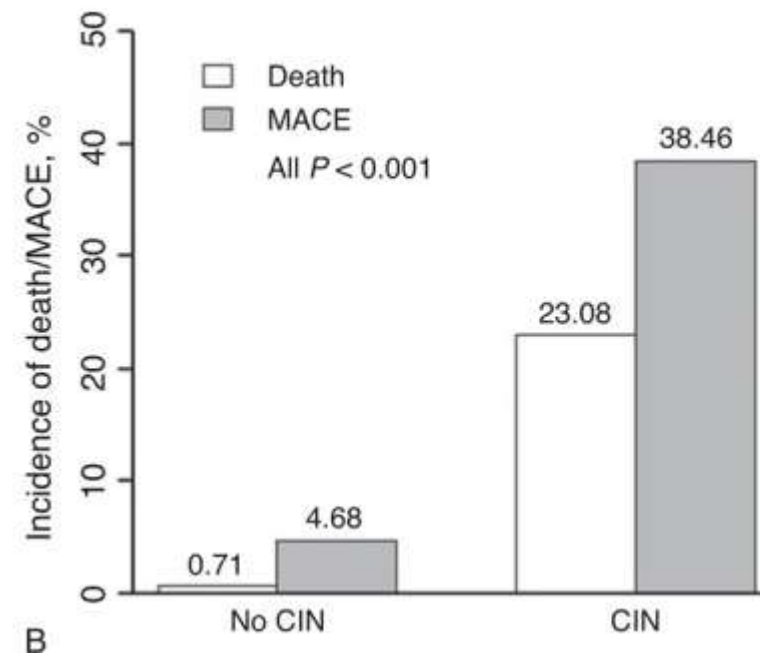
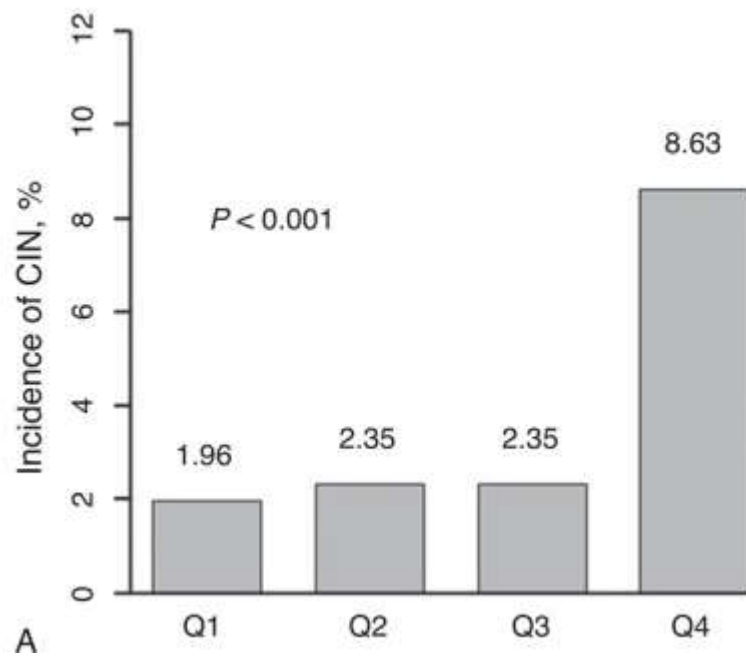
Jurado-Román et al. Am J Cardiol 2015

Gibt es PC-AKI überhaupt?



Abe et al. Am J Cardiol 2014

Gibt es eine sichere Dosis?



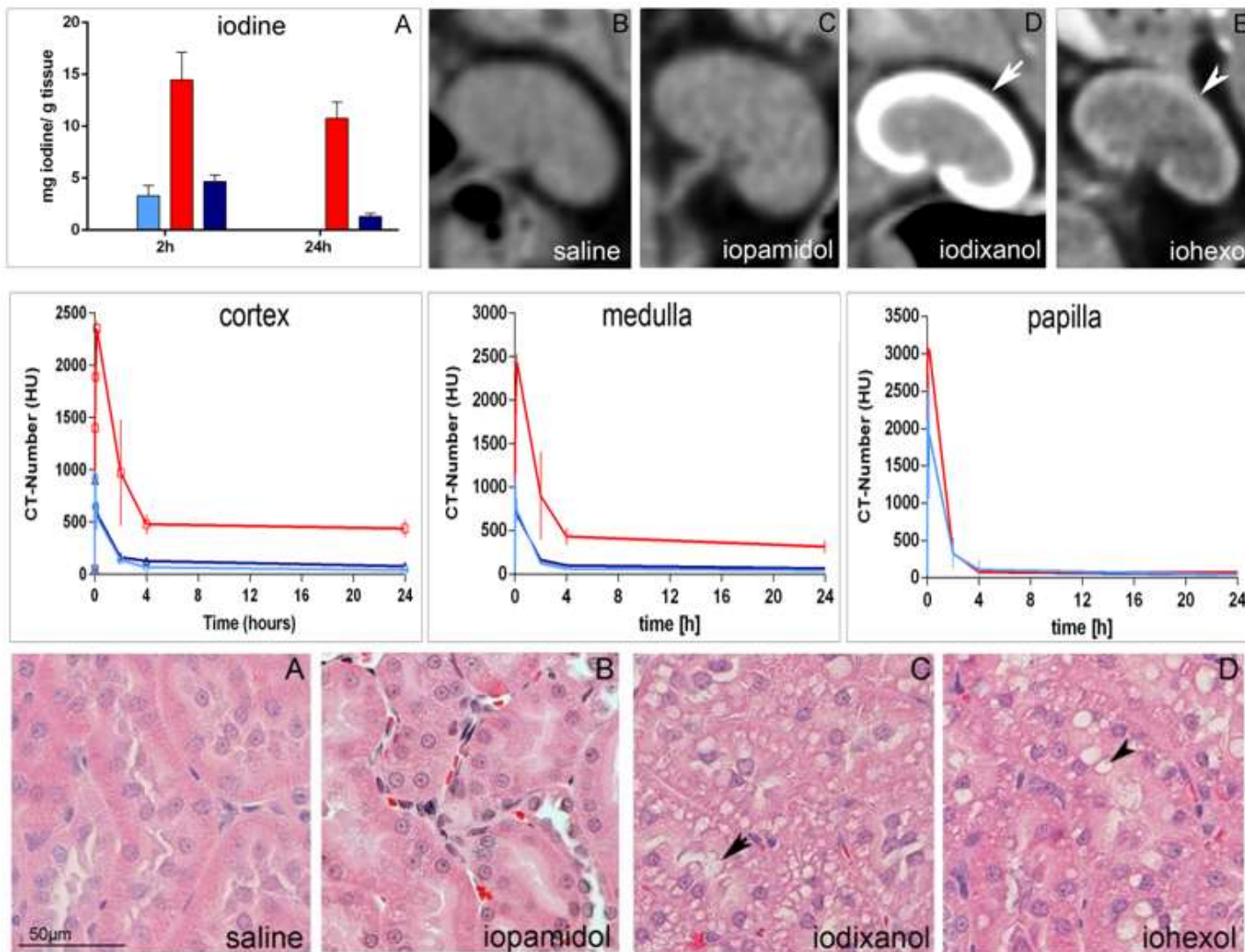
Liu et al. Medicine 2015

Müssen auf Kreatininwerte bestehen?

- Only 1%, of patients with abnormal serum creatinine will be overlooked if questioning the patients about risk factors (Olsen et al.).

Choyke PL, Cady K, DePollar SL, Austin H (1998) Determination of serum creatinine prior to iodinated contrast media: is it needed in all patients? *Tech Urol* 4:65–69
Olsen JC, Salomon B (1996) Utility of the creatinine prior to intravenous contrast studies in the emergency department. *J Emerg Med* 14:543–546

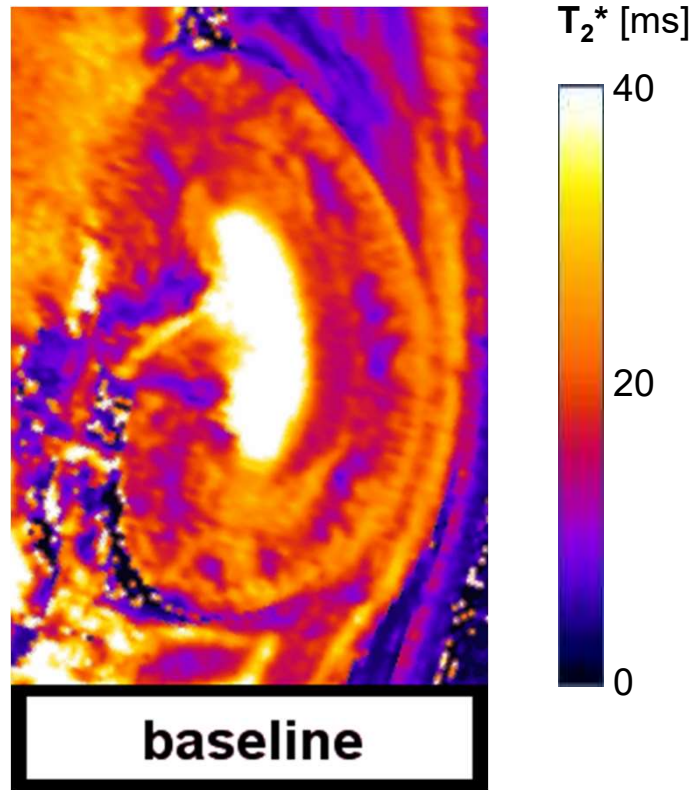
Was passiert in der Niere?



Seeliger and Persson, Acta Physiologica 2019 (in press)

PC-AKI

T₂* in the mouse (9.4 T)



baseline – ischemia (45 min) – reperfusion (100 min)

Isolierte vasa recta

Vascular

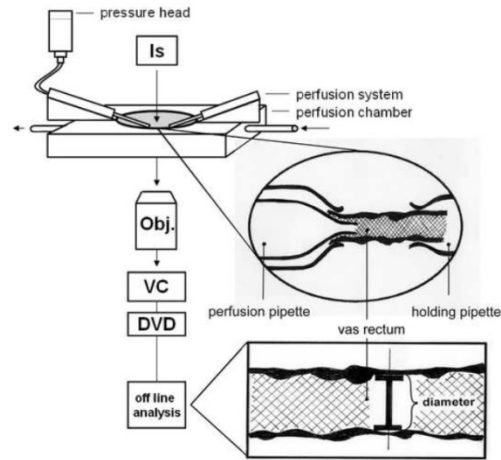
Endothelial
Damage

ROS

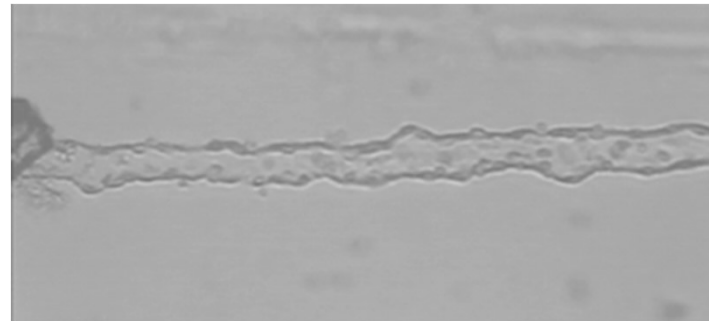
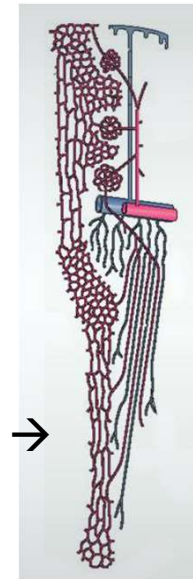
NO

Vasocon-
striction

?



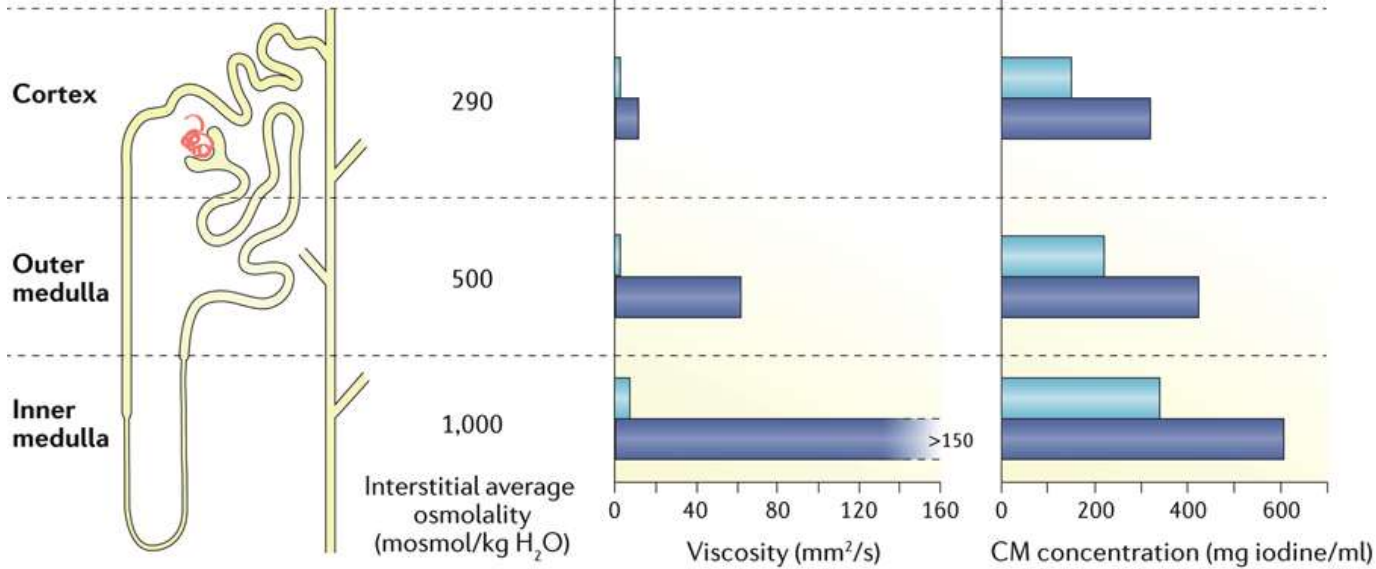
Vasa recta →



Sendeski et al. Radiology 2009
Sendeski et al. Invest Radiol 2010

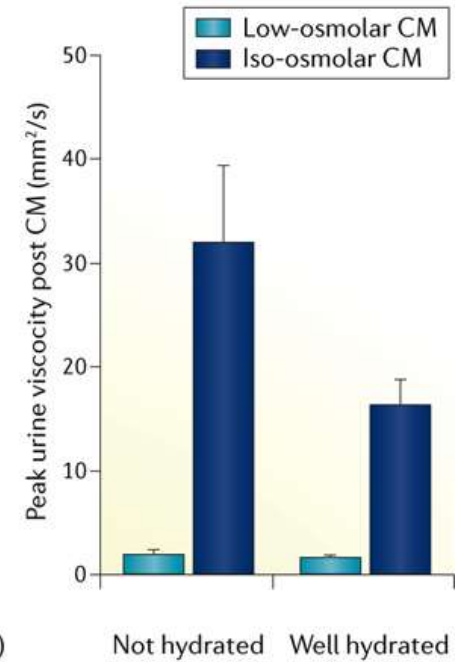
a

Clinically used solution



b

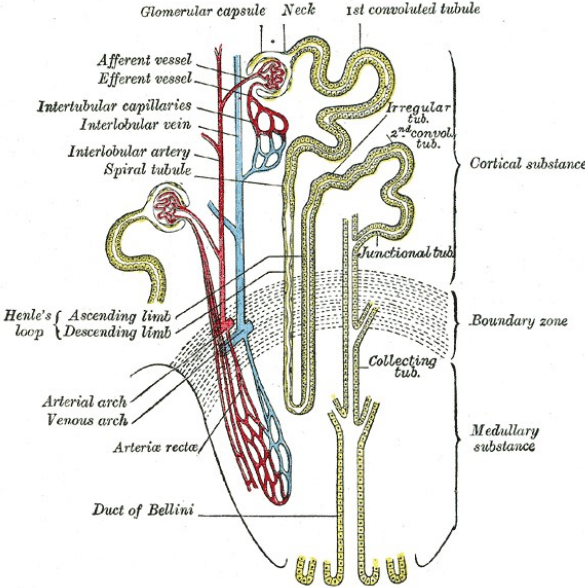
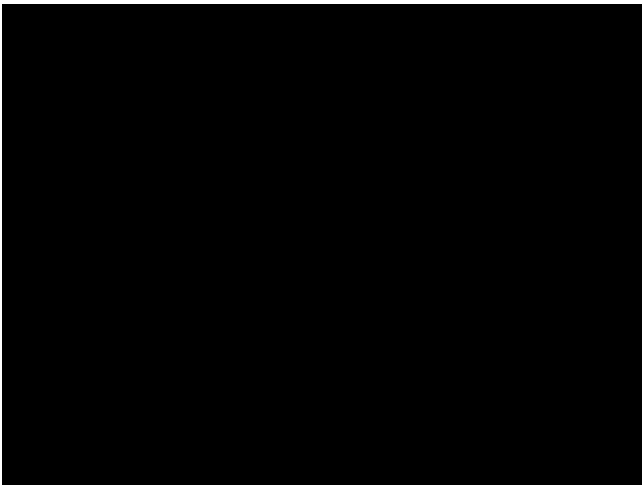
In vivo urine



Nature Reviews | Nephrology

Tubuläre Mechanismen der PC-AKI

Fluid Viscosity

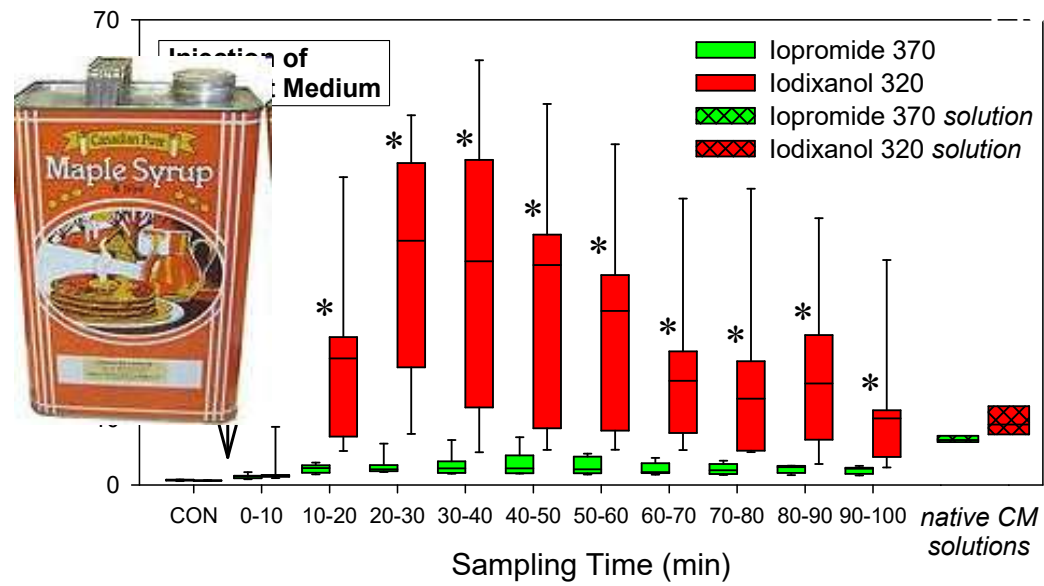


Tubulusschaden durch die Viskosität



Seeliger et al. Radiology 2010

Tubulusschaden durch die Viskosität



Seeliger et al. Radiology 2010

Retention von Iodixanol 24h nach Angioplastie PK3



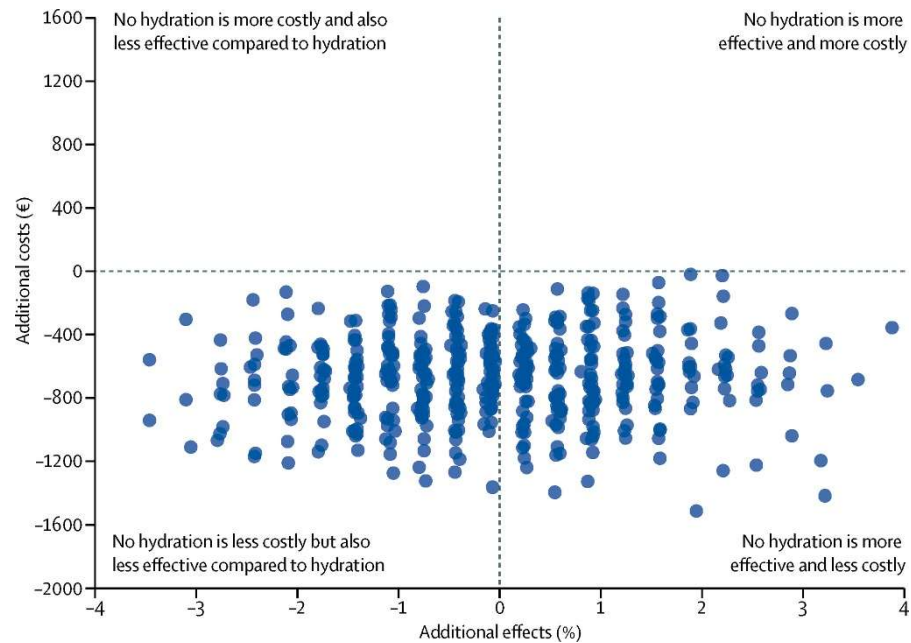
FIGURE 3. Axial unenhanced CT scan in an 80-year-old man 24 hours after angioplasties and placement of 3 stents. The procedure required 500 mL (2.2 g I/kg) of iodixanol 320 and 73.3 minutes of fluoroscopy time. Bilateral global nephrograms with corticomedullary distinction. Right kidney (A, arrow) with cortical attenuation of 150.17 HU and vicarious excretion into the gallbladder lumen (arrowhead). Lower abdominal image (B) through lower pole of right kidney and mid region of left kidney (arrows). Left kidney cortical attenuation of 158.8 HU.

Chu et al. Invest. Radiol. 2016

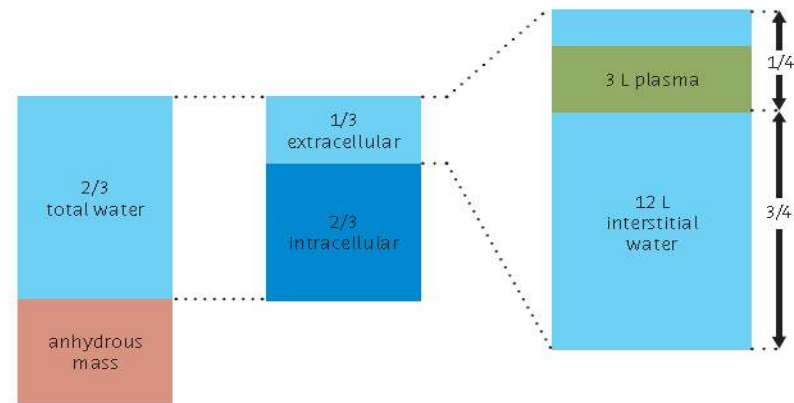


Prophylactic hydration to protect renal function from intravascular iodinated contrast material in patients at high risk of contrast-induced nephropathy (AMACING): a prospective, randomised, phase 3, controlled, open-label, non-inferiority trial

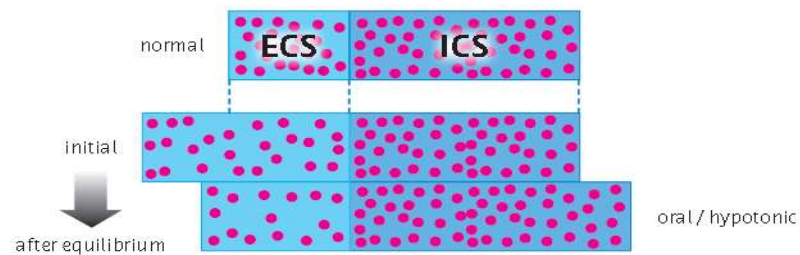
Estelle C Nijssen, Roger J Renneberg, Patty J Nelemans, Brigitte A Essers, Marga M Janssen, Marja A Vermeeren, Vincent van Ommen, Joachim E Wildberger



Orale Hydrierung

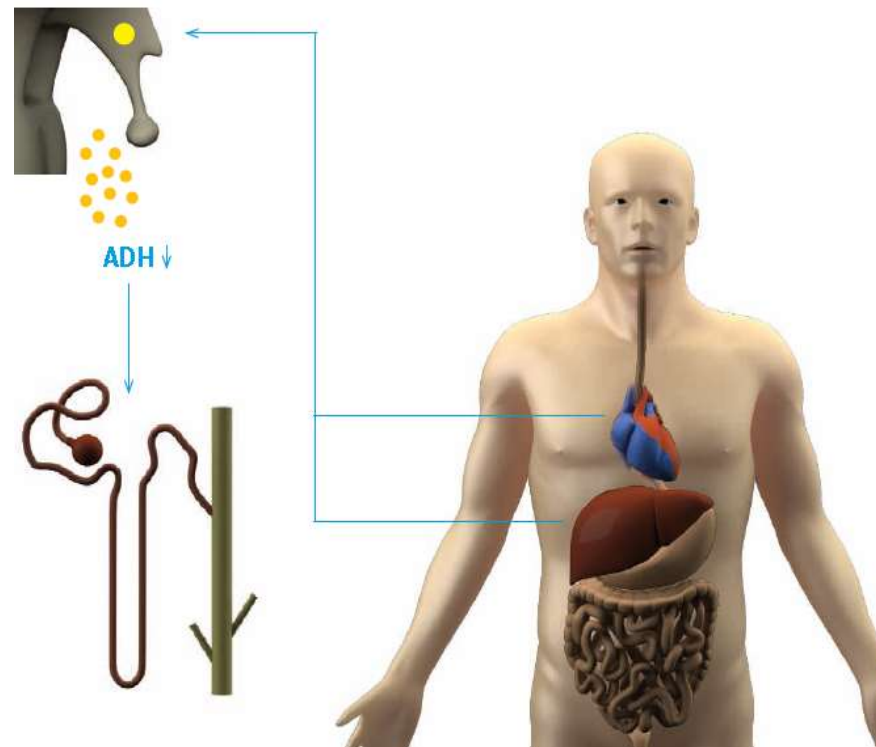


Fluid compartments of the body

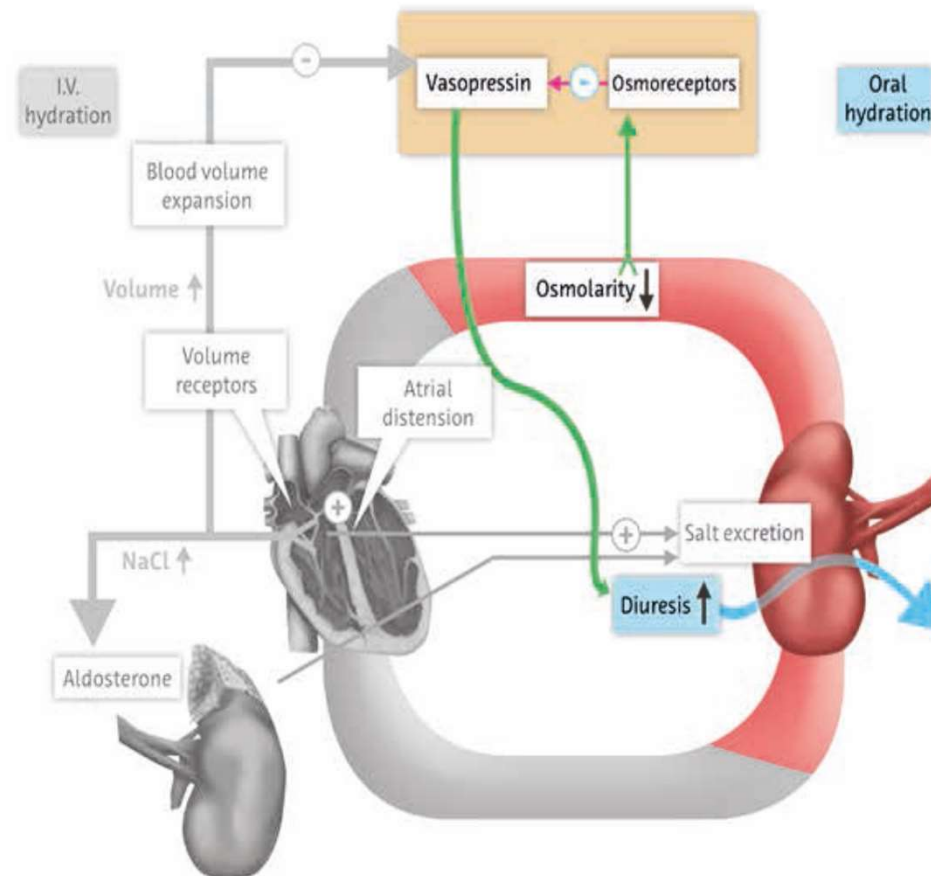


Oral hydration expands extracellular space

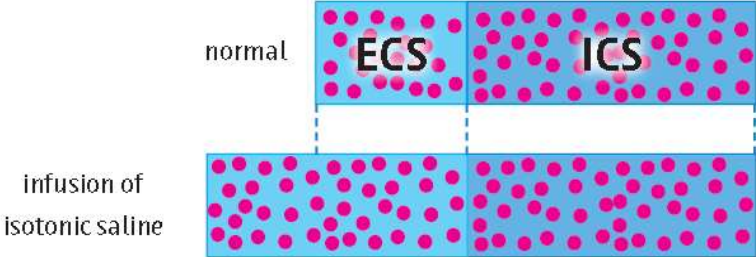
Orale Hydrierung



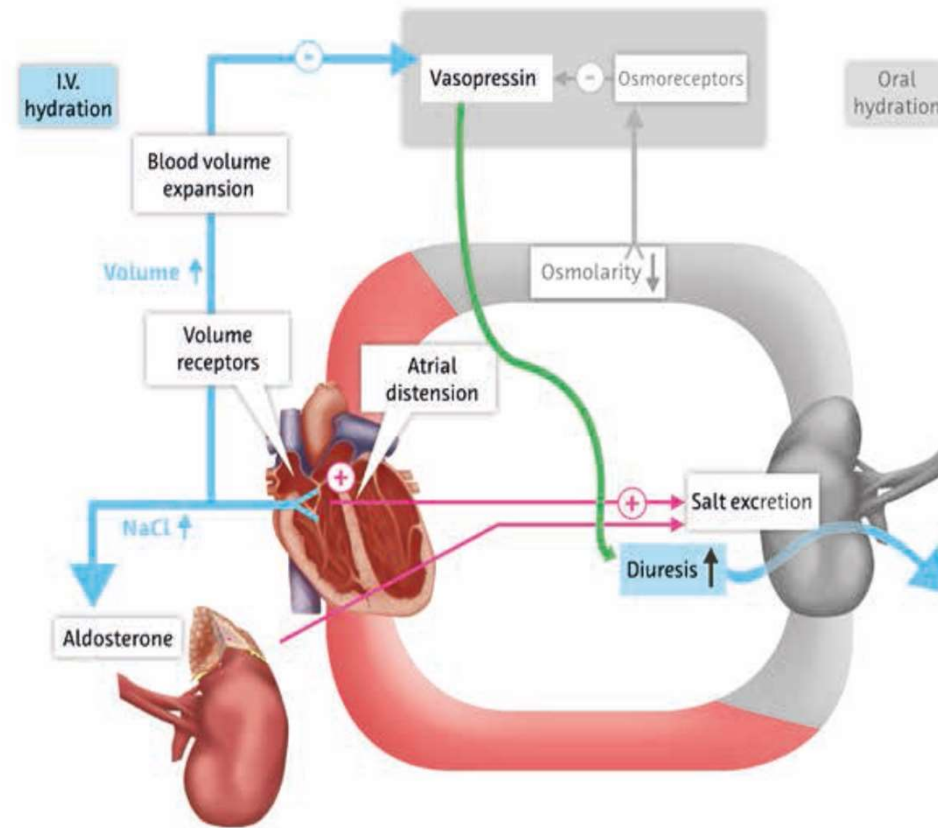
Orale Hydrierung



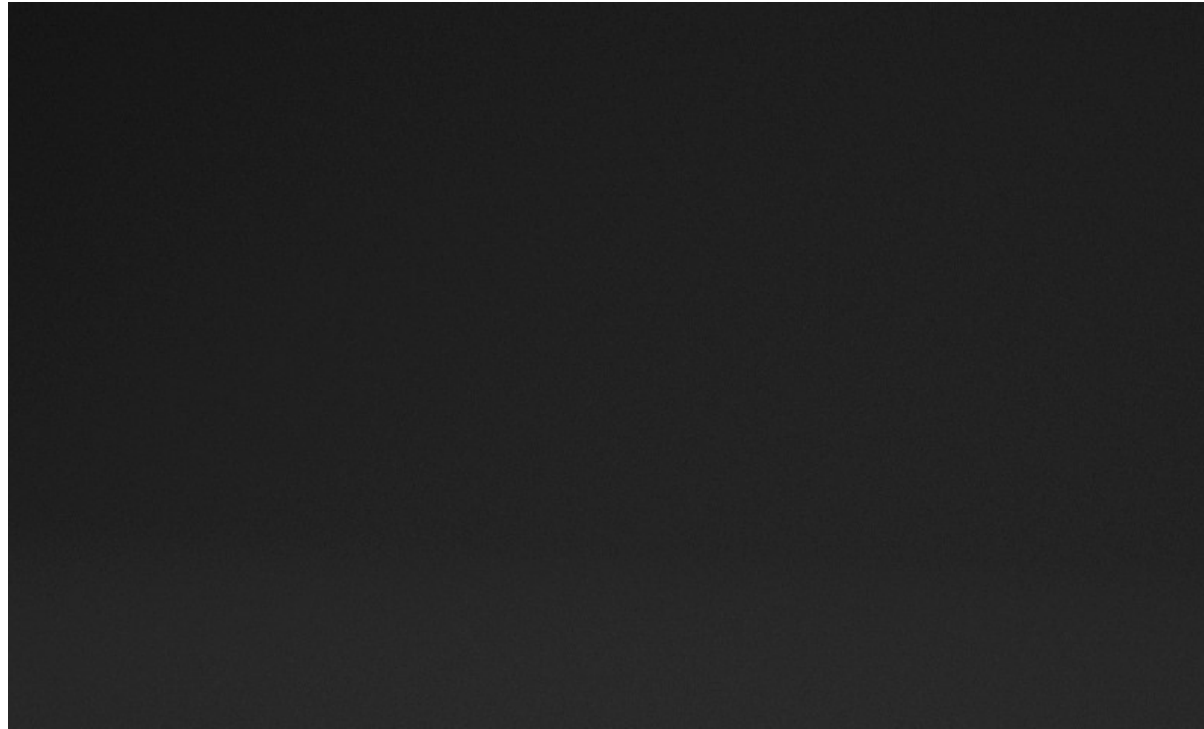
i.v. Kochsalzinfusion



i.v. Kochsalzinfusion



Monomer oder Dimer?



Ein Abgesang auf die Gefährlichkeit des Akuten Nierenversagens nach Kontrastmittelgabe?

Offenlegung: Seit 16 Jahren Berater für „renal safety“ der Bayer AG



Prof. Dr. med. Pontus B. Persson