

# L'essentiel sur les conséquences cardiaques des FAV

J.PENGLOAN

Ajaccio 12-14 juin 2008



# FAV: Conséquences cardiaques

---

n Immédiates

n A long-terme

n Relations débit de FAV /  
Débit cardiaque

# AVP et conséquences cardiaques précoces

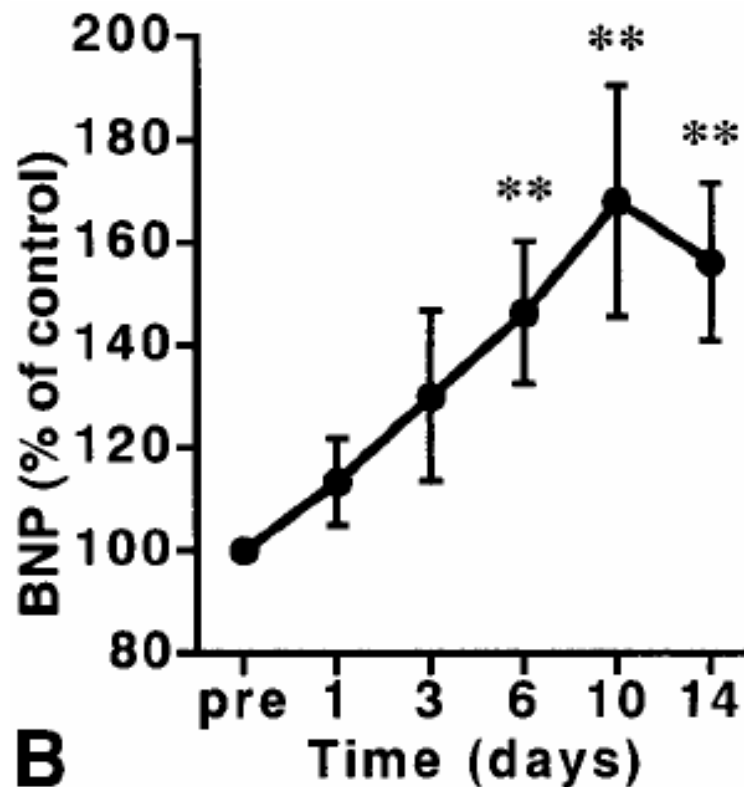
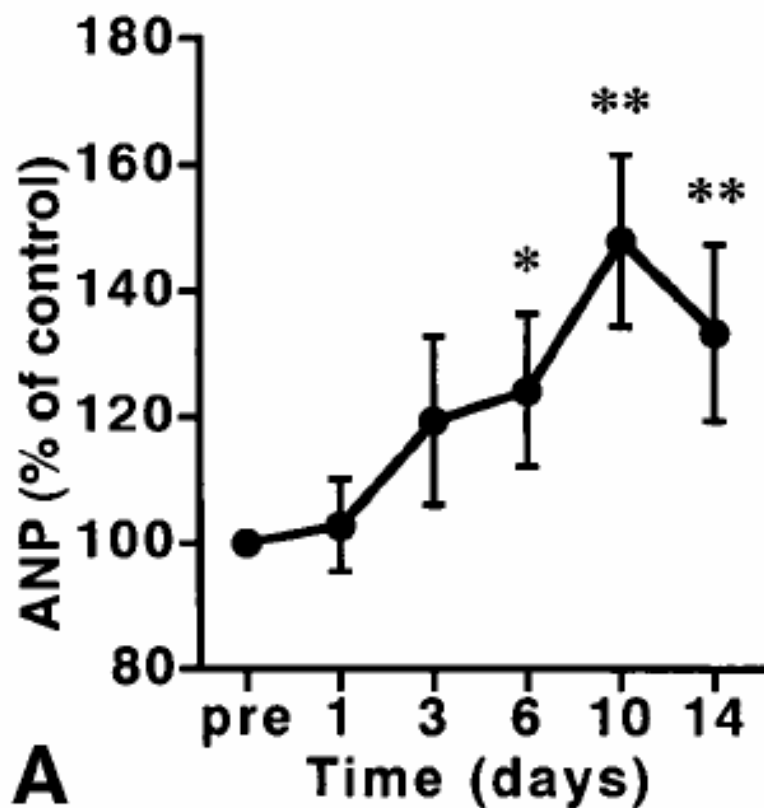
Y. Ory *Nephrol Dial Transplant* 1996 11-S1- 94-97

n 2 semaines après la création d'une FAV :

n fraction de raccourcissement	:	&	15.8	+/-	6.3 %
n volume d'éjection	:	&	21.9	+/-	5.3 %
n fraction d'éjection	:	&	10.6	+/-	4.5 %
n débit cardiaque	:	&	19	+/-	6.9 %
n Résistances Vasculaires Systémiques	:	↘	23.5	+/-	7 %
n ANP	:	&	83.7	+/-	17 %
n PRA	:	↘	41.2	+/-	10 %
n Aldostérone	:				no change

# Effects of the Creation of Arteriovenous Fistula for Hemodialysis on Cardiac Function and Natriuretic

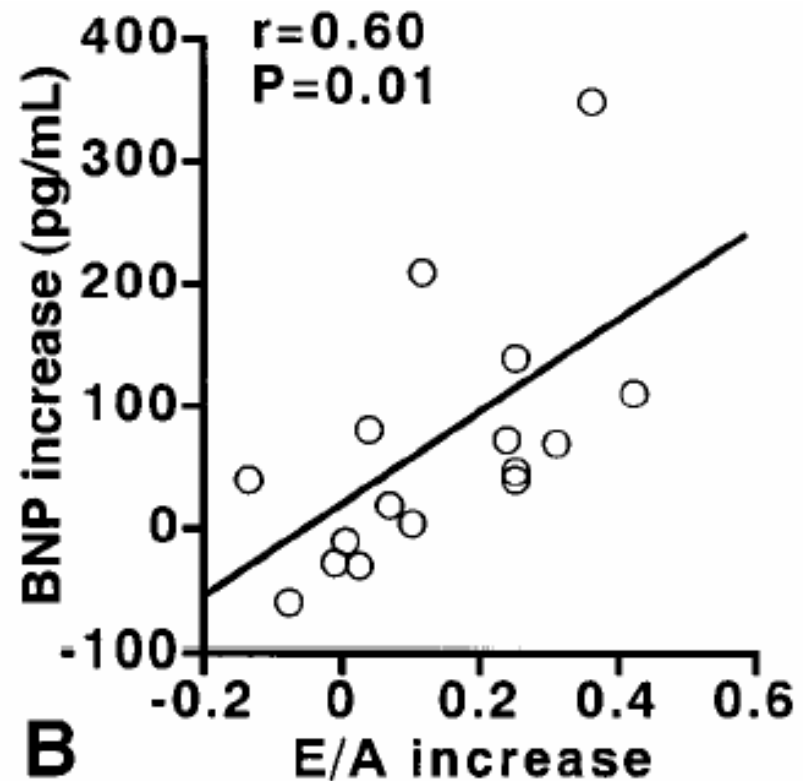
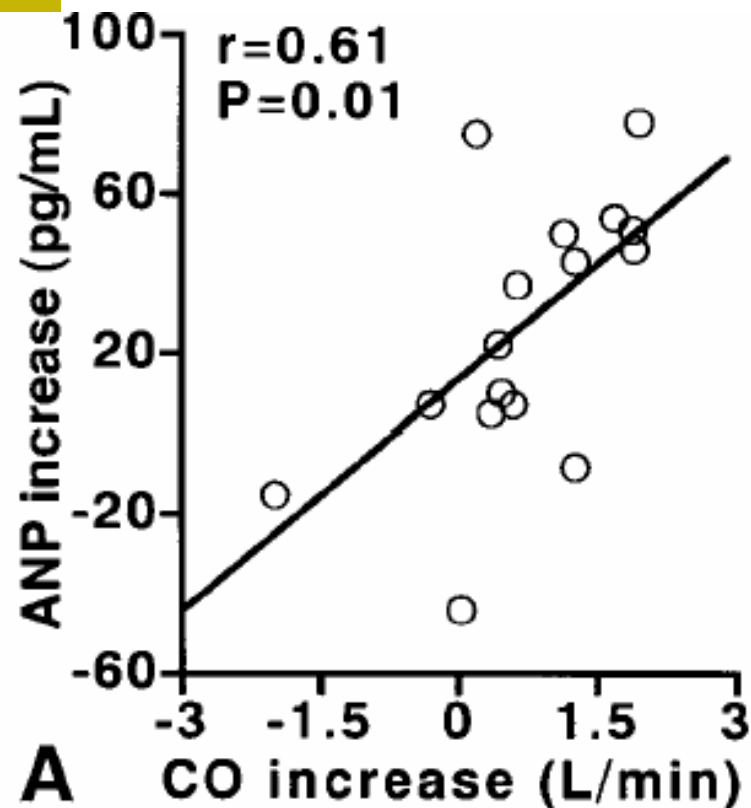
Peptide Levels in CRF *Iwashima, Am J Kidney Dis (2002) 40:974-982.*



Percentage of increase in plasma concentrations of (A) ANP and (B) BNP after the AV fistula operation. Values given as mean SE. \* $P < 0.05$ . \*\* $P < 0.01$  compared with control (pre) for each peptide.

# Effects of the Creation of Arteriovenous Fistula for Hemodialysis on Cardiac Function and Natriuretic

Peptide Levels in CRF *Iwashima, Am J Kidney Dis (2002) 40:974-982.*



# AVP et conséquences cardiaques précoces

---

Ø *C'est un état de surcharge volémique compensée*

Ø *Dysfonction diastolique*

# FAV: Conséquences cardiaques

---

n Immédiates

n **A long-terme**

n Relations débit de FAV /  
Débit cardiaque

# FAV: Conséquences cardiaques

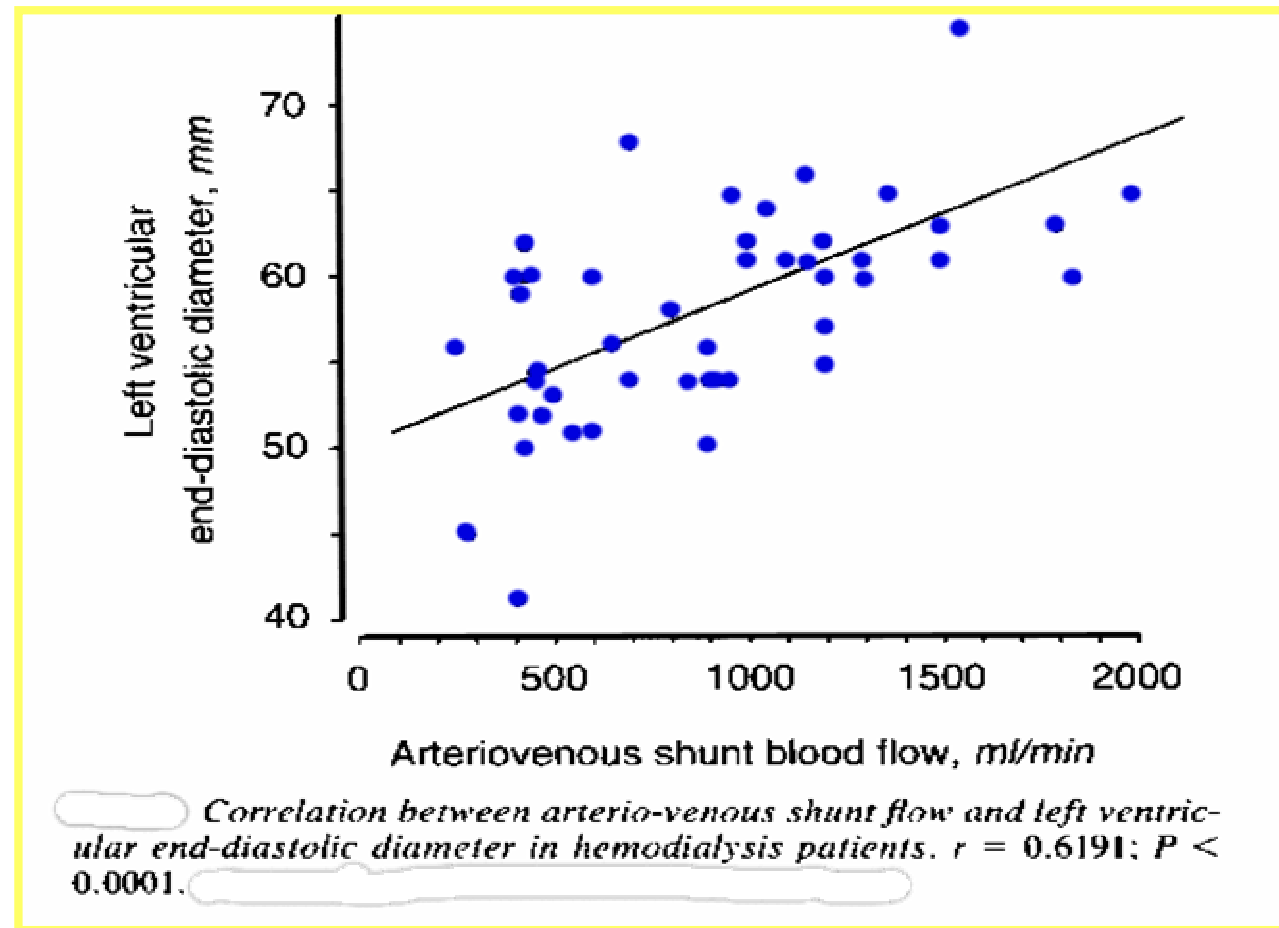
---

n HVG

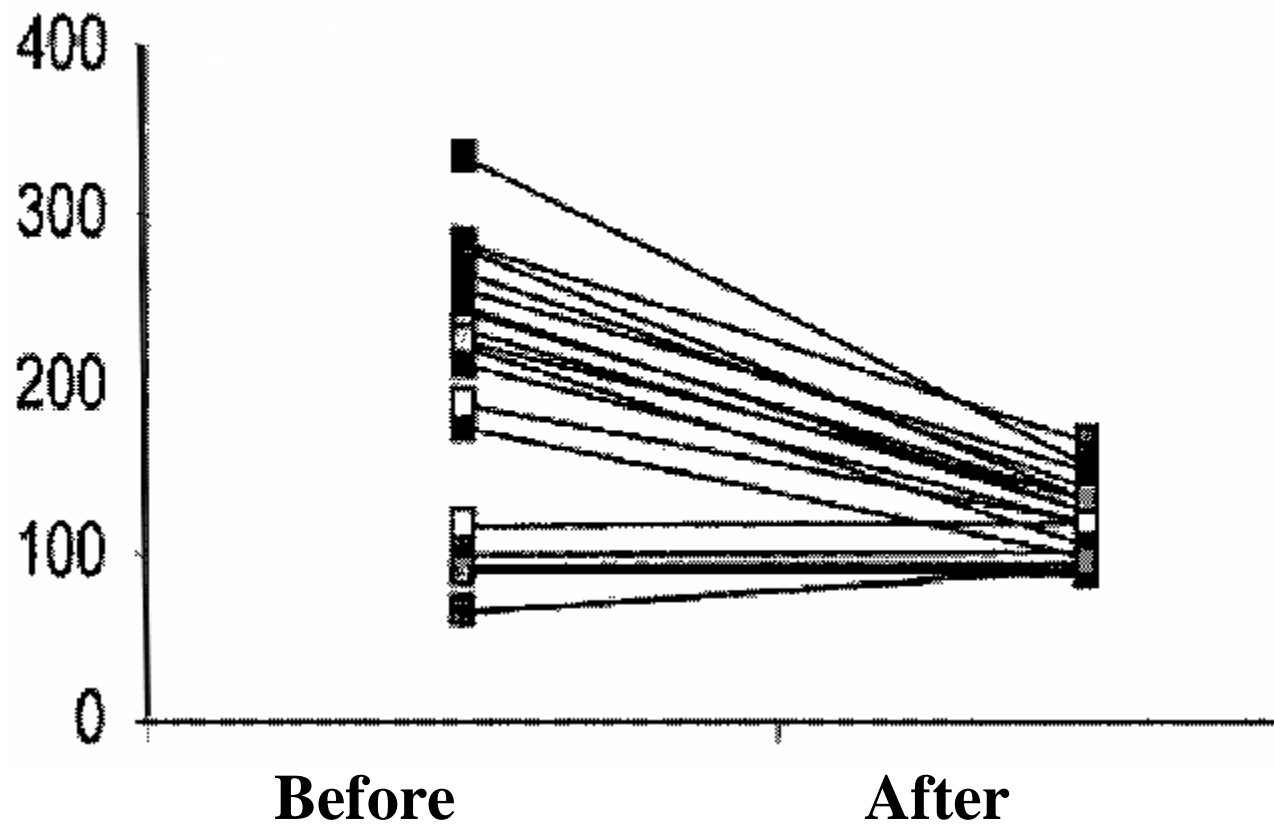
n HTAP

n Ischémie myocardique

# AVP et conséquences cardiaques au long cours : hémodialysé chronique



# AVP et conséquences cardiaques au long cours : évolution après ligature de AVP chez les transplantés rénaux

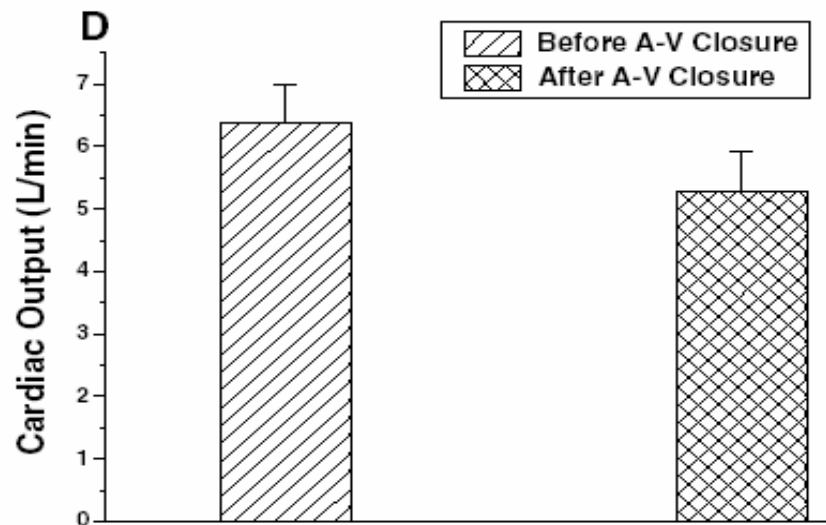
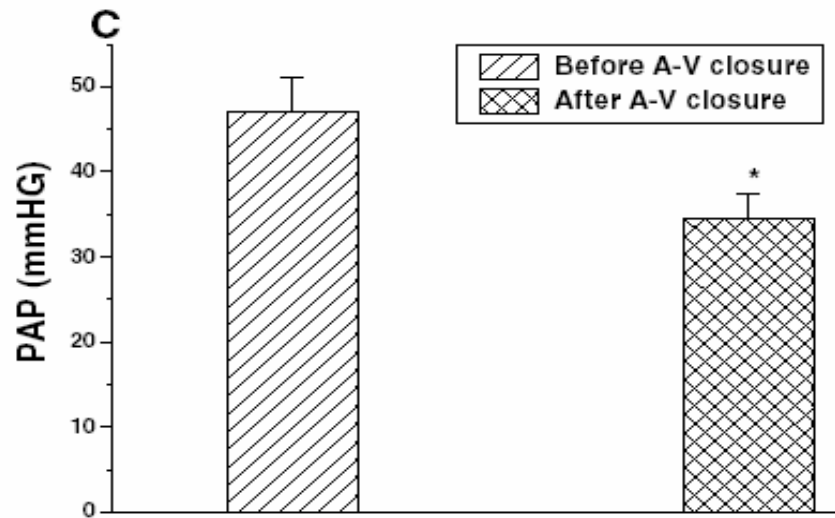


# Pulmonary Hypertension in Patients With End-Stage Renal Disease

(CHEST 2003; 123:1577–1582)

- n PH > 35 mm Hg was found
  - n in 39.7% of patients receiving hemodialysis (mean SD, 44 7 mm Hg; range, 37 to 65 mm Hg),
  - n in none of the patients receiving PD,
  - n in 1 of 12 predialysis patients.
- n Patients with PH receiving hemodialysis had a significantly higher cardiac output (6.9 L/min vs 5.5 L/min, p 0.017).

# The pathogenesis of pulmonary hypertension in haemodialysis patients via arterio-venous access

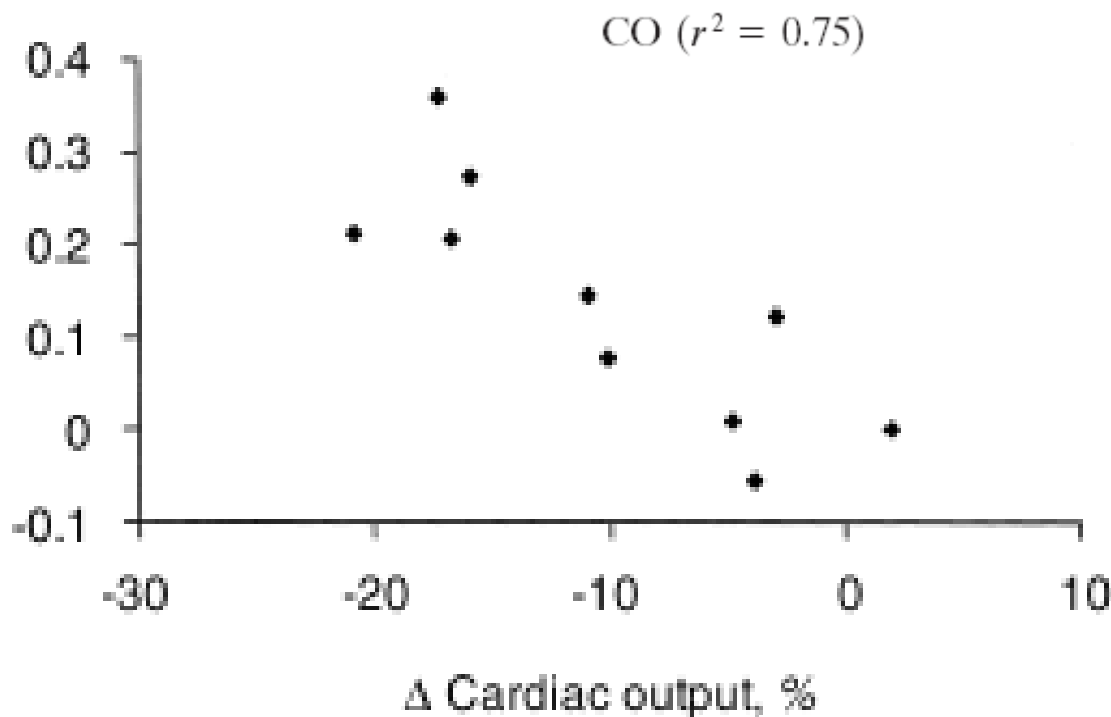


Pulmonary arterial pressure (PAP) and cardiac output (CO) in HD patients with pulmonary hypertension (PHT) before A-V access compression (C and D, n¼8). \*P<0.05 compared with the relevant value before A-V closure.

## Effects of arteriovenous fistulas on cardiac oxygen supply and demand

W J W Bos,

$\Delta$  Diastolic pressure time index/  
systolic pressure time index



Change in DPTI/SPTI ratio during fistula compression in relation to changes in cardiac output (CO). The decrease in CO during shunt compression is used as a substitute for fistula flow. The improvement in DPTI/SPTI ratio, representing a measure for cardiac oxygen supply in relation to demand, during shunt compression is related to the decrease.

# FAV et coeur

---

∅ C'est un état de surcharge volémique compensée.

Il s'accompagne

∅ d'une hypertrophie excentrique du VG  
partiellement réversible après ligature de la FAV

∅ D'une HTAP partiellement réversible après  
ligature de la FAV ou transplantation rénale

∅ La FAV entraîne une augmentation des besoins en  
oxygène du myocarde

# FAV: Conséquences cardiaques

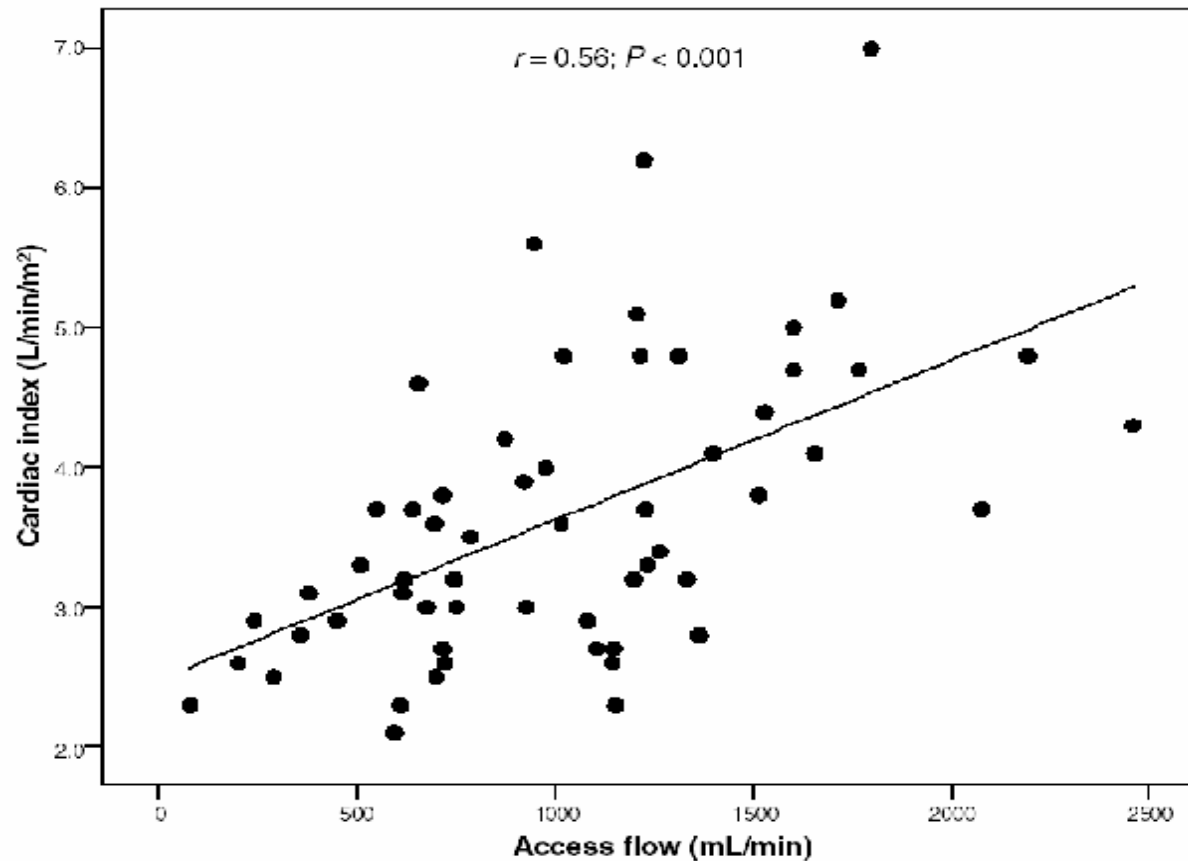
---

n Immédiates

n A long-terme

n Relations débit de FAV /  
Débit cardiaque

# The Relation Between Vascular Access Flow and Different Types of Vascular Access With Systemic Hemodynamics in Hemodialysis Patients



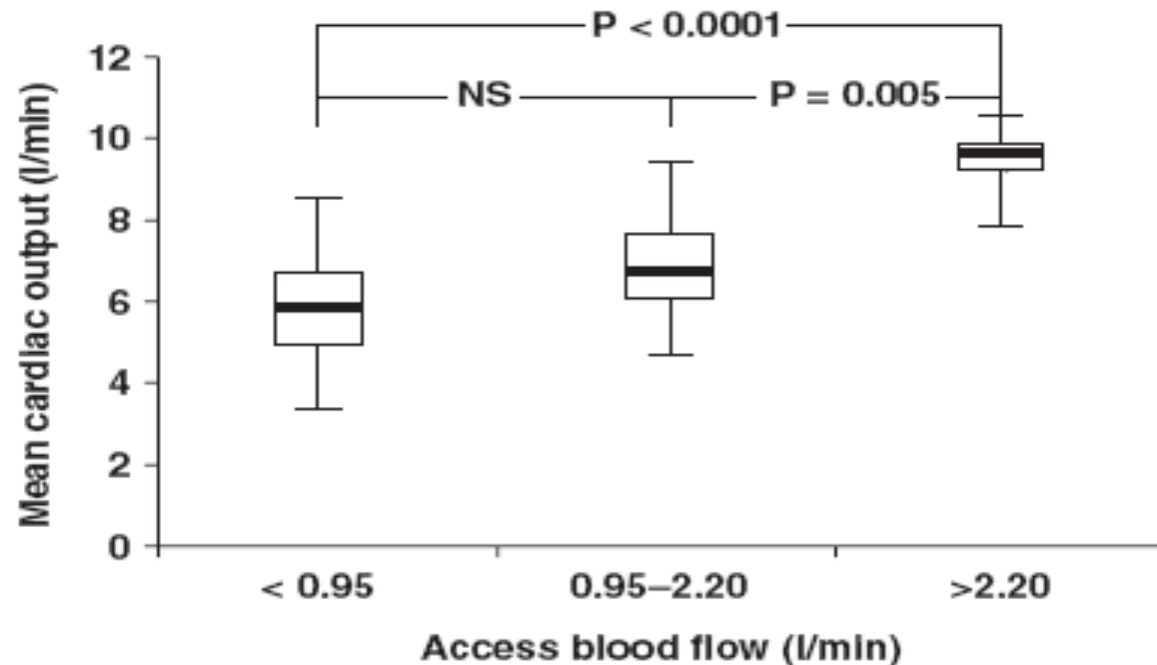
58 Patients

Relation between cardiac index and access flow.

*Artif Organs, Vol. 29, No. 12, 2005*

# The relationship between the flow of arteriovenous fistula and cardiac output in haemodialysis patients

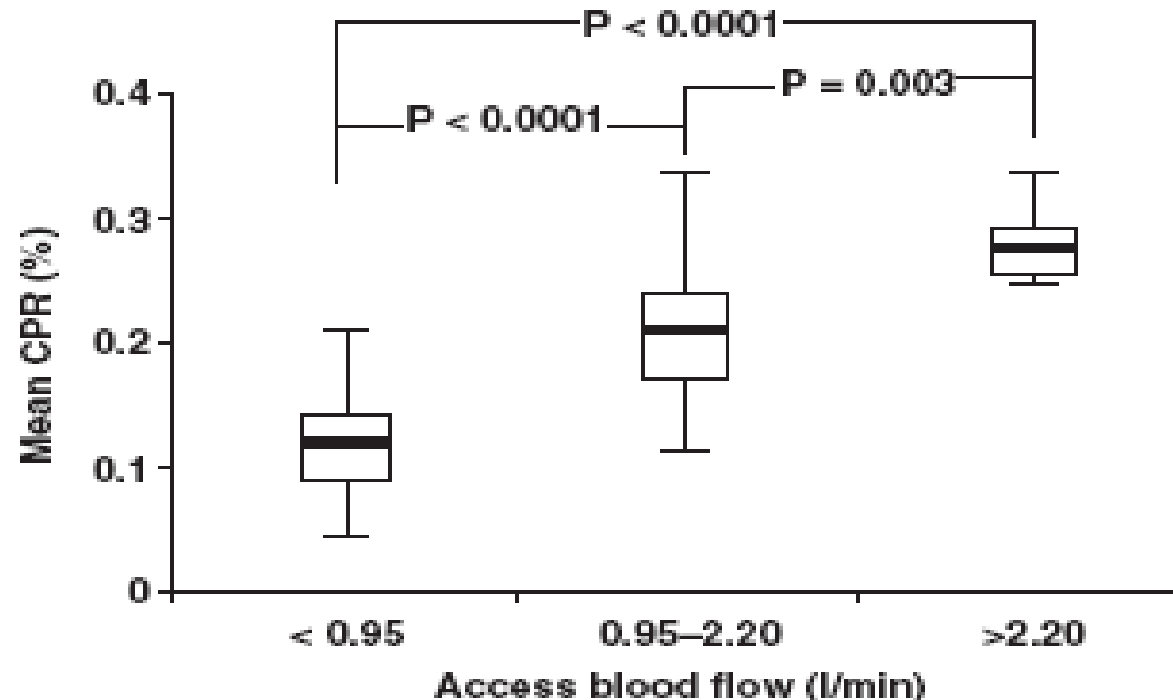
*Nephrol Dial Transplant (2008) 23: 282-287*



Comparison of the cardiac output values among the patients subdivided according to the vascular access flow cut-off values. The horizontal line represents the median, upper and lower limits of the box including the first and third quartiles, and capped bars indicate minimum and maximum value. The one-way ANOVA followed by the Tukey's post-hoc test was performed in order to compare the mean cardiac output values in each access blood flow category identified by the cut-off points previously calculated.

# The relationship between the flow of arteriovenous fistula and cardiac output in haemodialysis patients

*Nephrol Dial Transplant (2008) 23: 282-287*

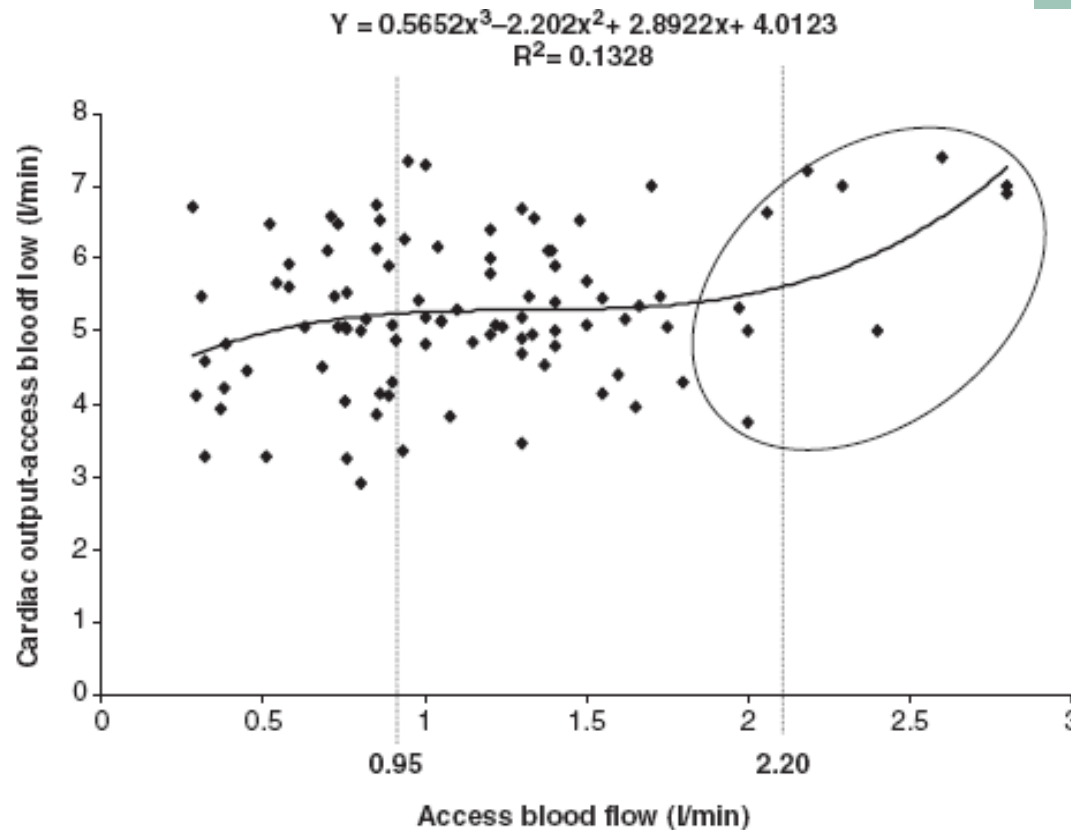


Comparison of the cardio-pulmonary recirculation (CPR) values among the patients subdivided according to the vascular access flow ( $Q_a$ ) cut-off values.

The horizontal line represents the median, upper and lower limits of the box including the first and third quartiles, and capped bars indicate minimum and maximum value. The one-way ANOVA followed by the Tukey's post-hoc test was performed in order to compare the mean CPR values in each  $Q_a$  category identified by the cut-off points previously calculated.

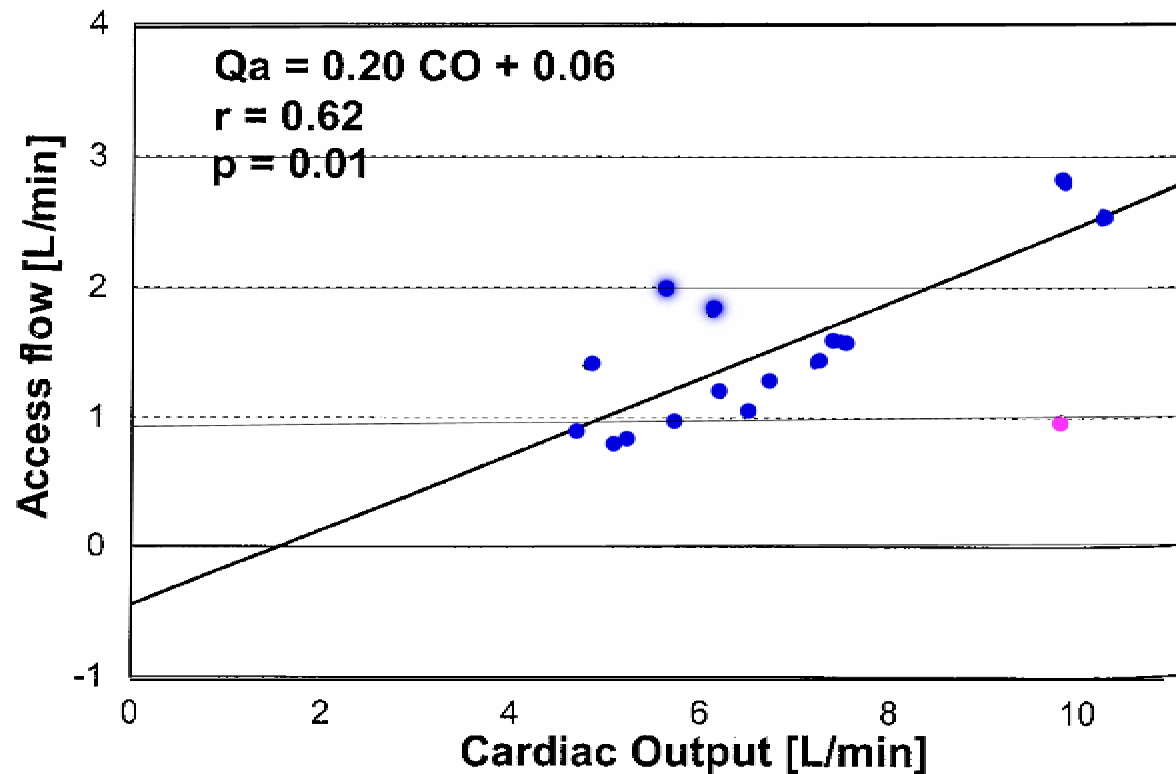
# The relationship between the flow of arteriovenous fistula and cardiac output in haemodialysis patients

Nephrol Dial Transplant (2008) 23: 282-287



Best-fit regression model of the relationship between vascular access flow and the systemic flow (cardiac output - access blood flow). The ellipse encompasses 10 patients who were classified as affected by stage C cardiac failure and by high-output cardiac failure

# Débit cardiaque et débit d'abord vasculaire



The relationship of access flow (Qa) to cardiac output (CO) at baseline . The patient with the low Qa/CO is ●

# Coeur et FAV

- n Créer une FAV
  - n La plus distale possible
  - n Le plus faible débit possible
- n Ne pas créer de FAV:
  - n Coronarien instable
  - n Du côté d'un pontage mammaire interne
  - n Insuffisance cardiaque (FE < 30%)
  - n HTAP sévère
  - n Cardiopathies hypertrophiques sévères ??

# Coeur et FAV

- n Evaluer le débit et le risque cardiaque d'une FAV
  - n Débit  $\geq$  2l/min
  - n Ratio Débit FAV/Débit cardiaque  $>$  20%
- n Ramener au poids sec/ déshydrater
- n Réduction de débit de la FAV
- n Ligature de la FAV
  - n Risque/bénéfice

