



**HEPATO 2019**  
XXV CONGRESSO BRASILEIRO  
DE HEPATOLOGIA



**Gastroenterologia  
Hepatologia**

**Avaliação não invasiva da fibrose nas  
doenças do fígado – Módulo III**

***Elastografia hepática em  
portador de doença renal crônica***

***Roberto J. Carvalho-Filho***

***02 de outubro de 2019***

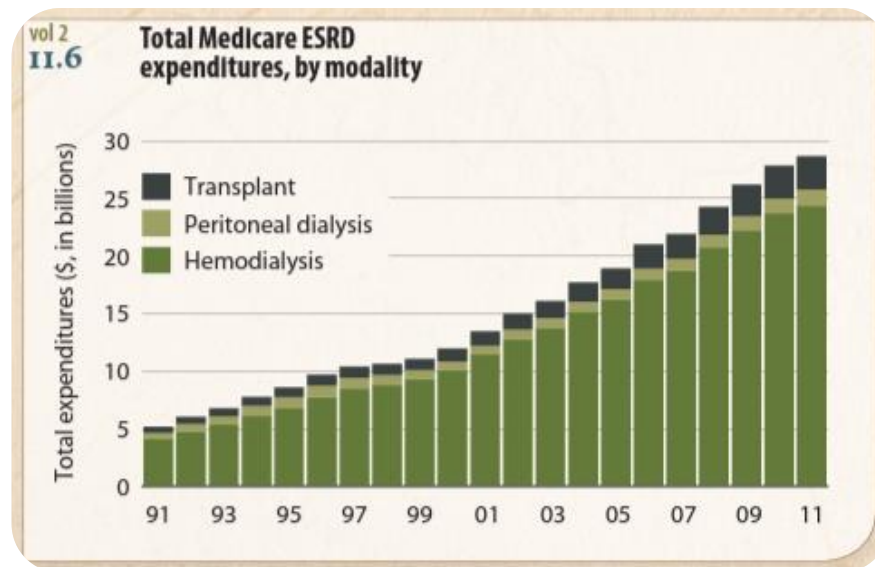
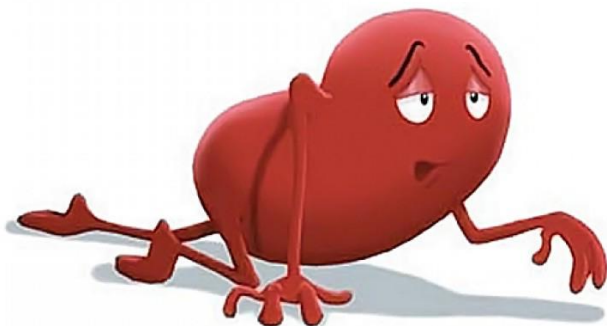
# Conflitos de interesse



0%

# Doença renal crônica (DRC)

- ✓ Prevalência mundial: 8 a 16%<sup>1</sup>
- ✓ Mortalidade:<sup>2</sup>
  - 1990: 27.<sup>a</sup> causa (15,7 óbitos/100.000/ano)
  - 2010: 18.<sup>a</sup> causa (16,3 óbitos/100.000/ano)
- ✓ Impacto econômico:
  - EUA, 2011: 30 bilhões/ano<sup>3</sup>

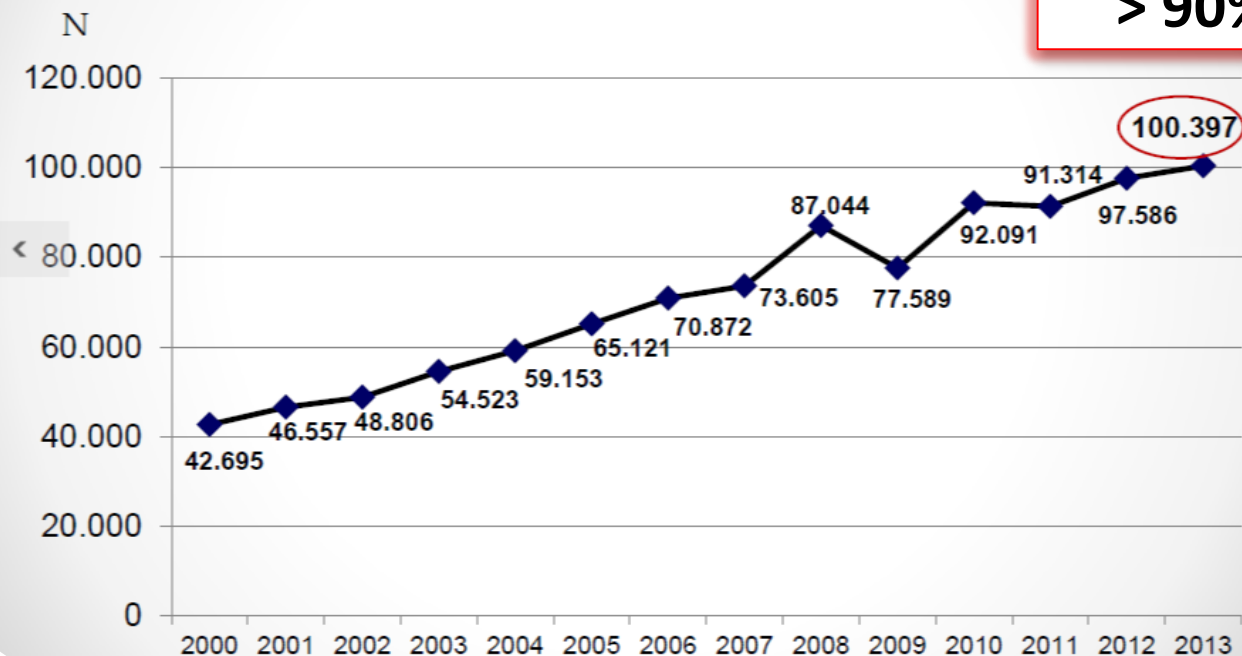


# DRC em HD no Brasil



Censo da Sociedade Brasileira de Nefrologia 2010

Total estimado de pacientes em tratamento dialítico por ano



**2018:**  
**133.000 em TRS**  
**> 90% em HD**

# Estádios da DRC

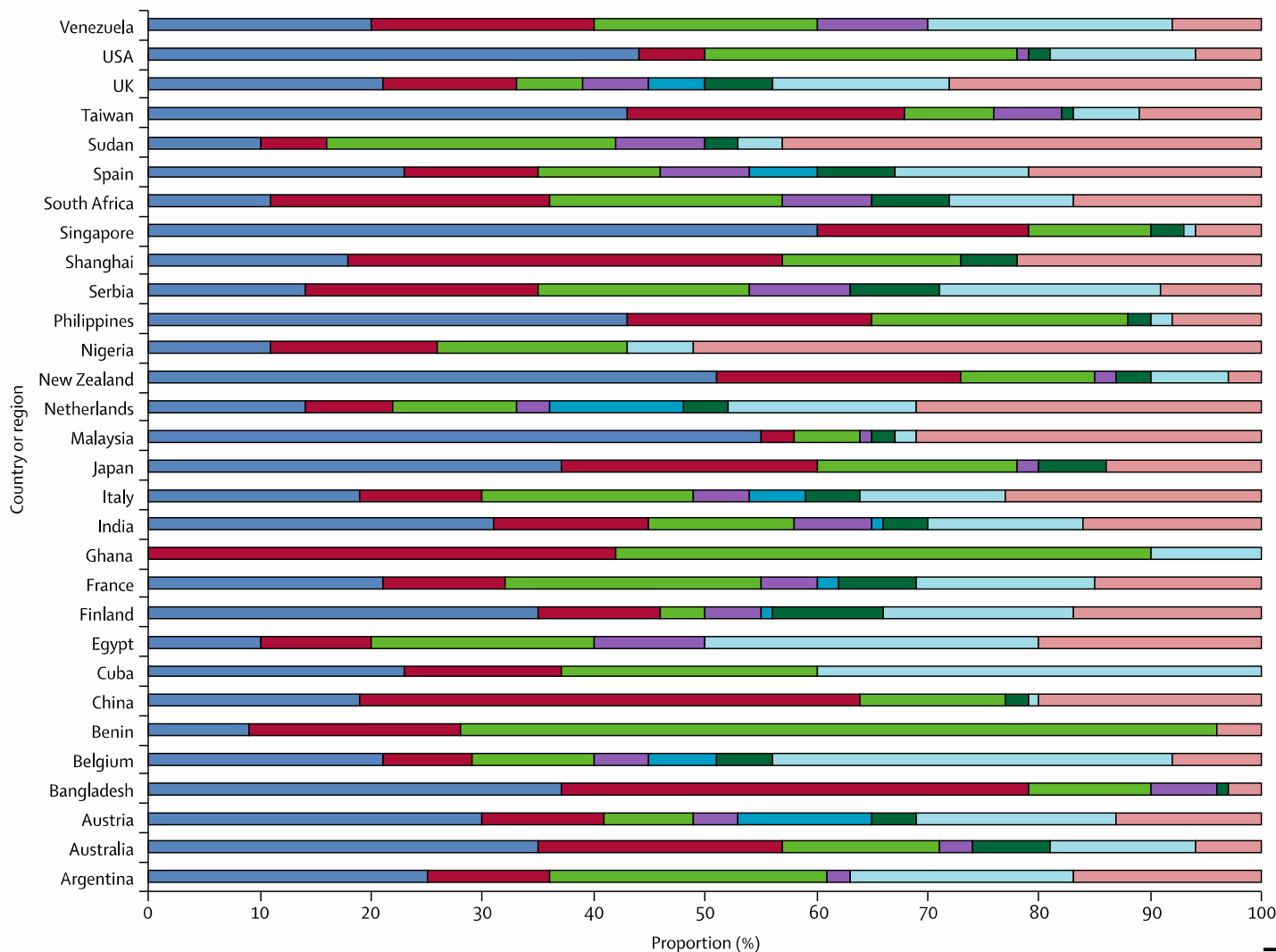
✓ **Disfunção renal: TFG <60 mL/min/1,73 m<sup>2</sup>**

	eTFG* (mL/min/1,73 m <sup>2</sup> )	Estádio DRC
Função renal normal	≥90	1†
Disfunção leve	60–89	2
Disfunção moderada	30–59	3
Disfunção grave	15–29	4
DRCT	<15 ou sob TRS (HD ou DP)	5

\*eTFG: estimativa do clearance de creatinina a partir da idade, gênero, raça e creatinina sérica.

†Com evidência de injúria renal.

# Causas de DRC (DRC)



**Diabetes**

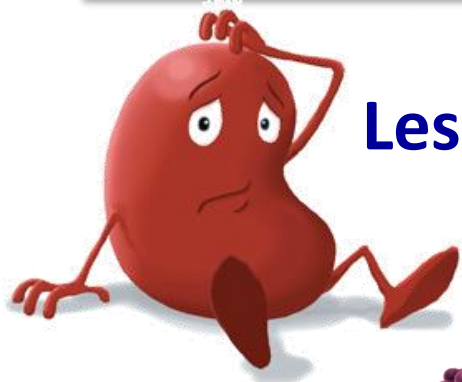
**HAS**

**GNC**

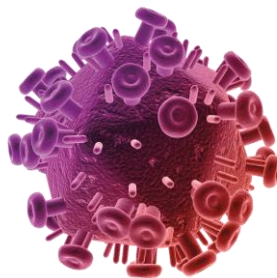
**INDET**

# Fígado e Rim: *ligações perigosas...*

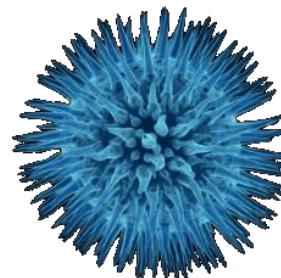
## Lesões renais nas hepatopatias



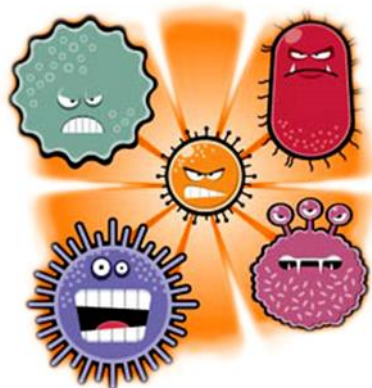
HCV



HBV



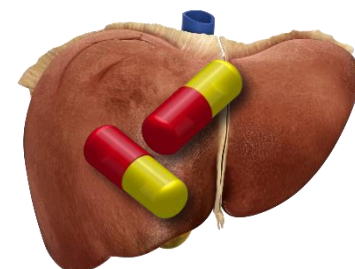
HEV



Infecções  
oportunistas

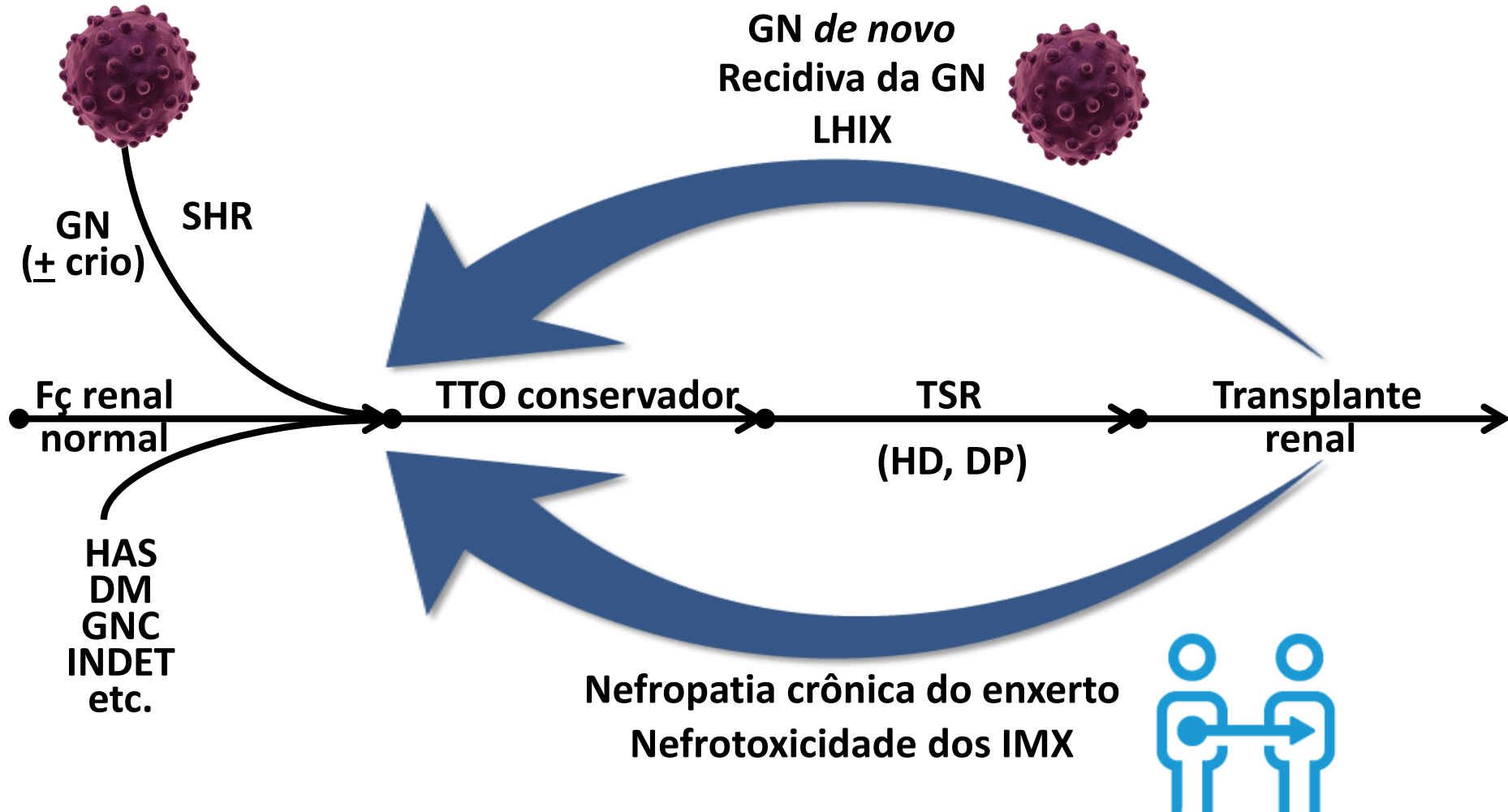


Disfunção  
renal na  
cirrose



LHID

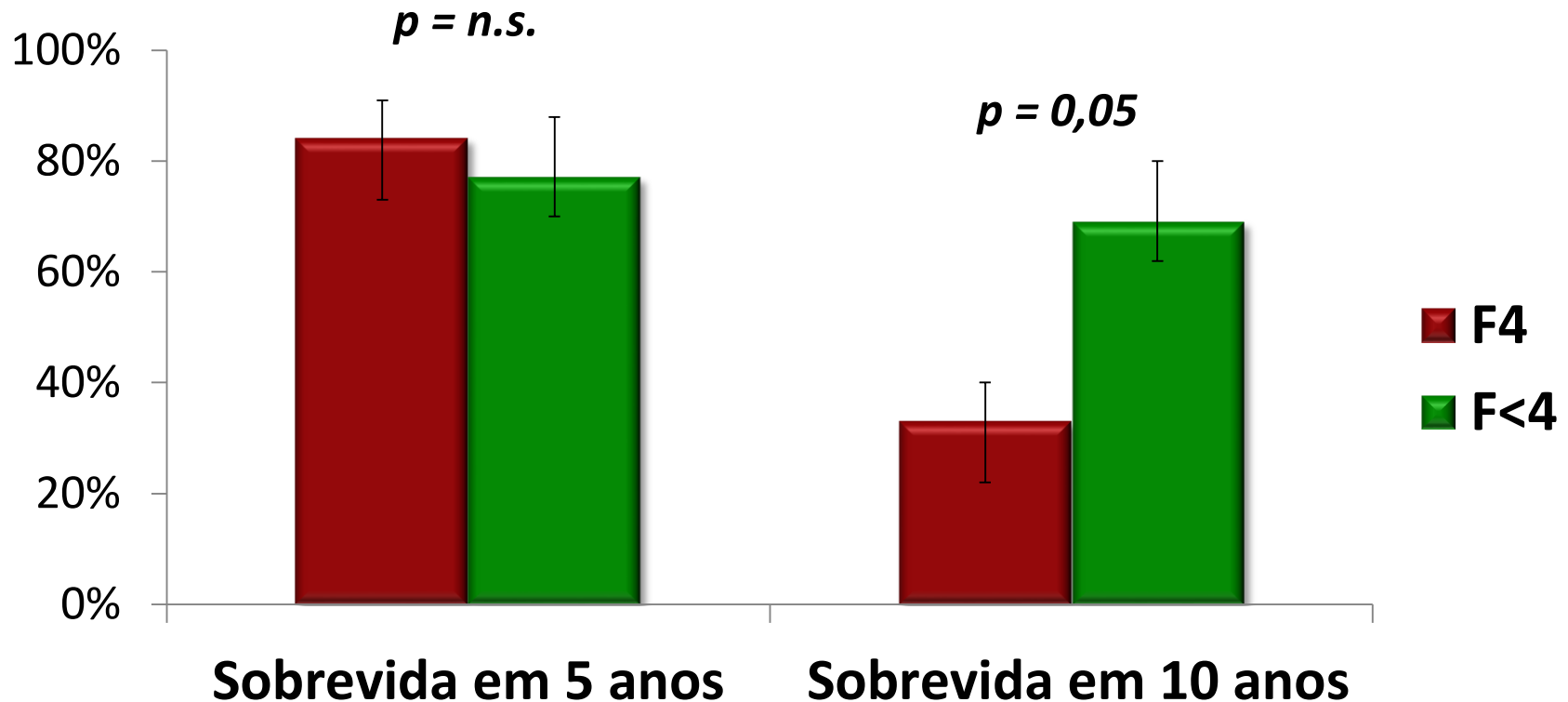
# Impacto na HN da DRC





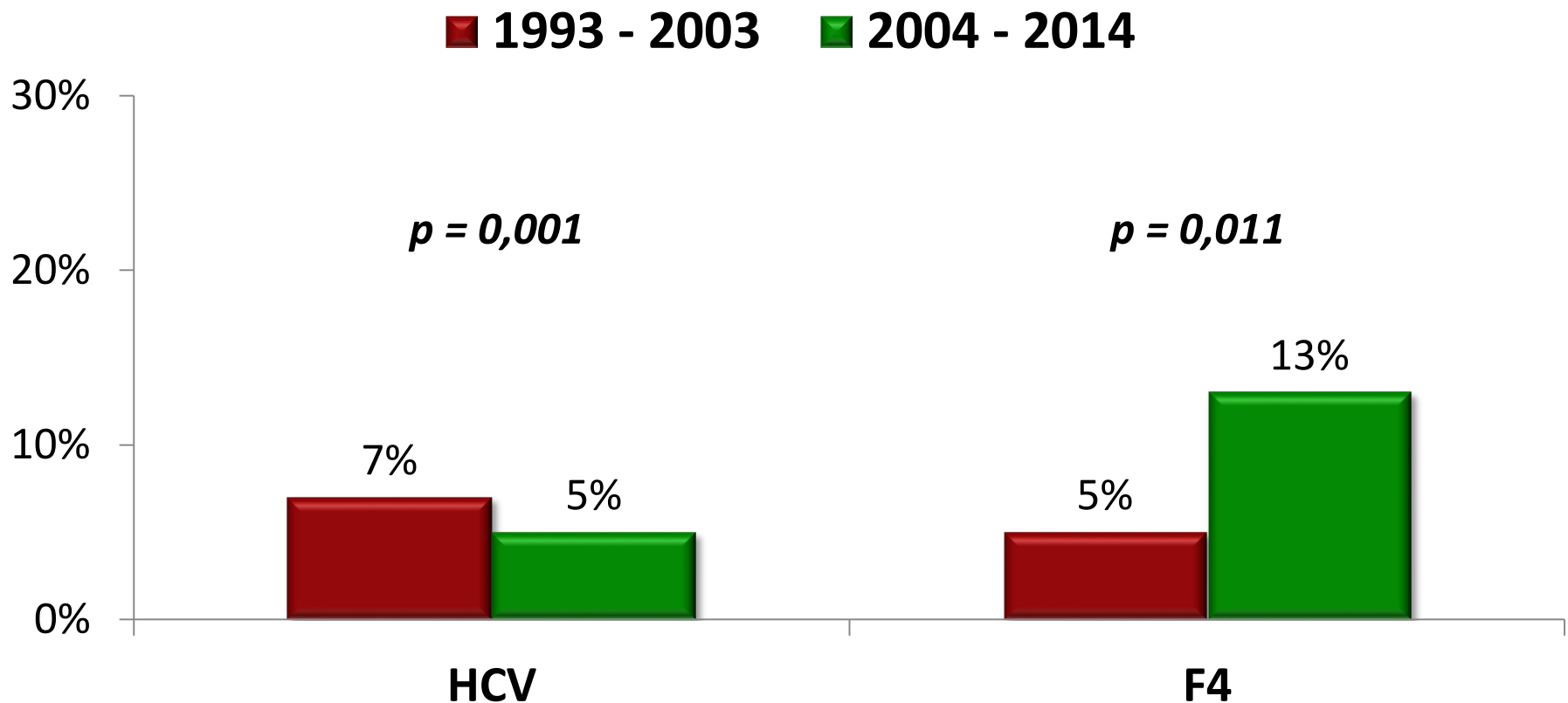
# Hepatopatia e transplante renal

*Cirrose = menor sobrevida pós-TxR*



# Hepatopatia e transplante renal

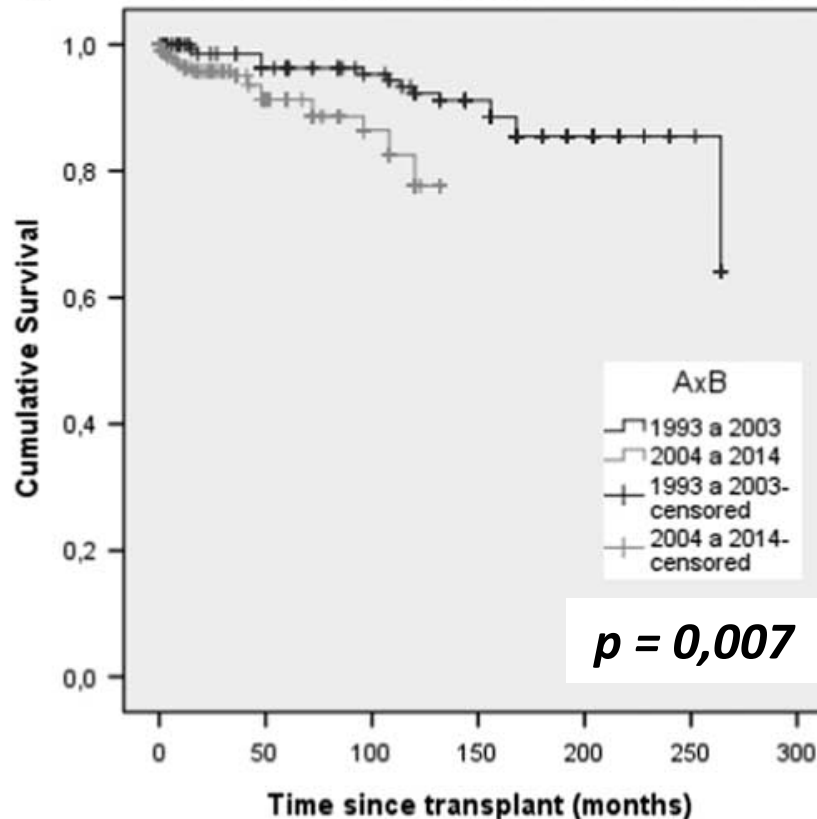
✓ n = 11.715



# Hepatopatia e transplante renal

✓ n = 11.715

## *Descompensação hepática*



# Hepatopatia e transplante renal

✓ n = 11.715

## *Descompensação hepática*

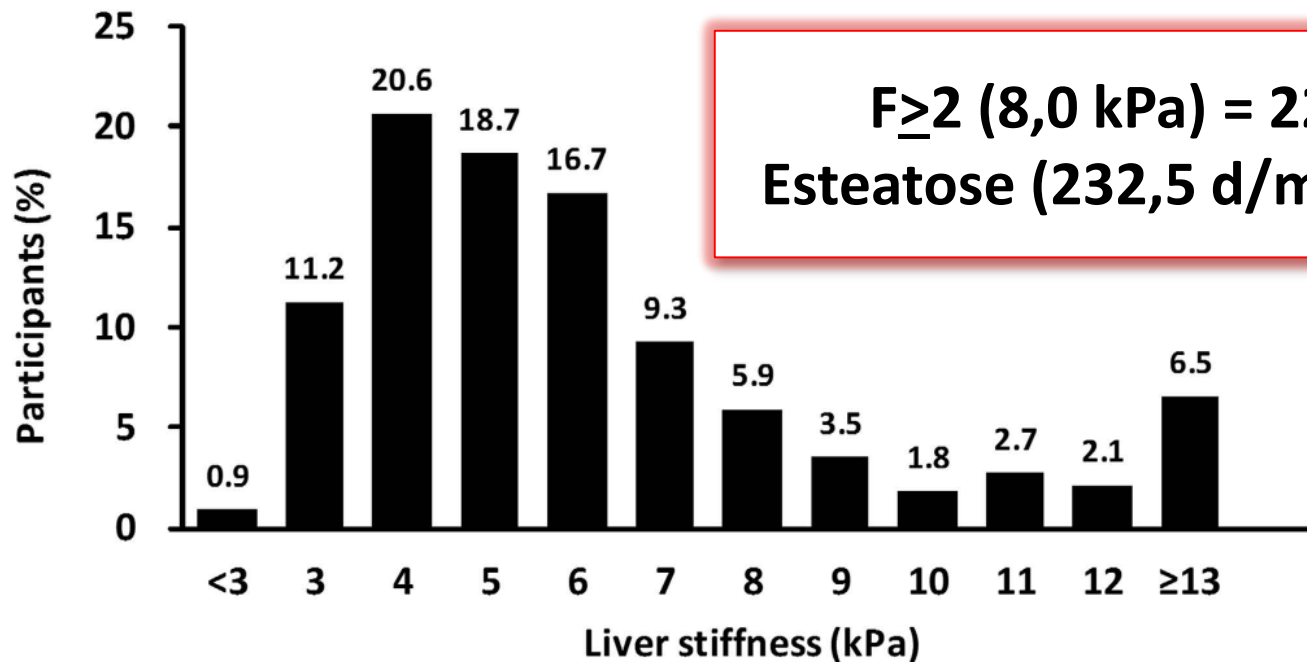
	Initial model		Final model	
	HR (95% CI)	P	HR (95% CI)	P
Age (years)	1.002 (0.968–1.037)	0.912	–	–
Group (A × B)	0.875 (0.288–2.660)	0.814	–	–
Sex (female × male)	0.551 (0.234–1.297)	0.172	–	–
Pre-RTx HCV treatment (yes × no)	1.622 (0.670–3.924)	0.283	–	–
Use of ciclosporina (yes × no)	0.424 (0.128–1.411)	0.162	–	–
Use of tacrolimo (yes × no)	0.894 (0.284–2.815)	0.849	–	–
Type of donor (living × deceased)	0.562 (0.231–1.366)	0.203	–	–
Cirrhosis pre-RTx (yes × no)	5.326 (2.111–13.437)	< 0.001	8.195 (3.804–17.655)	< 0.001

CI, confidence interval; HCV, hepatitis C virus; HR, hazard ratio; RTx, renal transplant.

# FibroScan® em HD

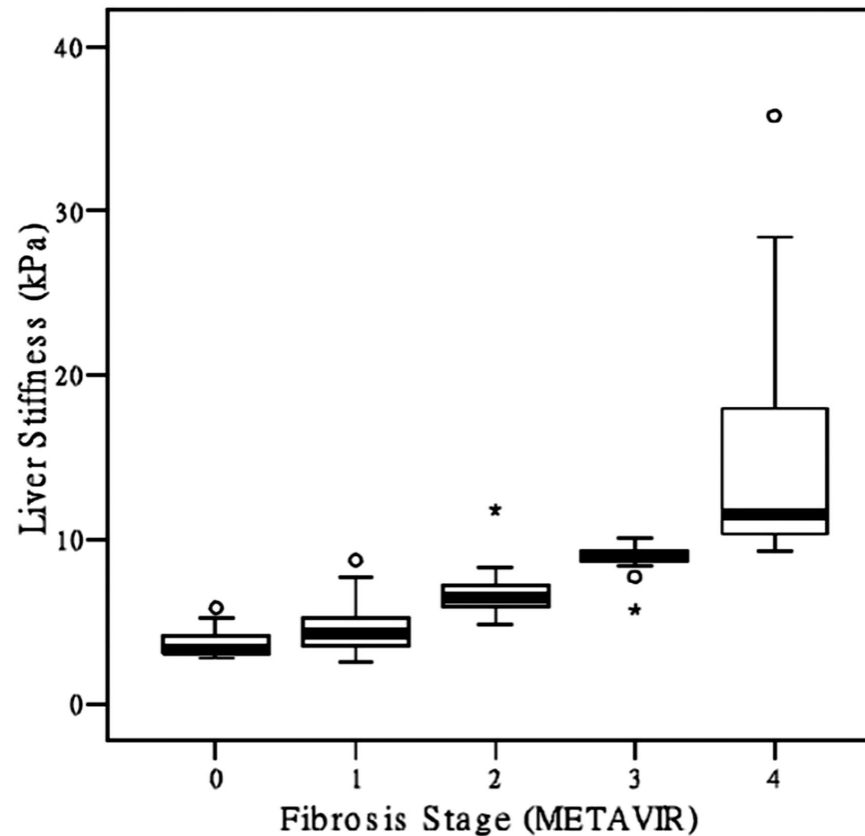
✓ n = 659, há > 6 meses.

## *Distribuição da rigidez hepática (kPa)*



# FibroScan® em HD

✓ n = 284, HCV+, 14% F3/F4



# FibroScan® em HD

✓ n = 284, HCV+, 14% F3/F4

AUROC	EHT	APRI	<i>p</i>
F <sub>≥</sub> 2	0,96	0,84	<0,001
F <sub>≥</sub> 3	0,98	0,93	0,04
F4	0,99	0,92	0,13

# FibroScan® em HD

✓ n = 284, HCV+, 14% F3/F4

Fibrose	F <sub>≥2</sub>	F <sub>≥3</sub>	F4
Cut-off (kPa)	7,1	9,5	12,5
Sen	55%	45%	36%
Esp	96%	99%	100%
VPP	89%	95%	100%
VPN	80%	92%	97%
LR+	14,50	109,80	-
LR-	0,46	0,55	0,64
Acu	82%	92%	97%



# Fatores confundidores na EH

**Esteatose**

**Inflamação**

**Álcool**

**Inexperiência**

**Alimentos**

**Elastografia  
hepática**

**Congestão**

**Colestase**

**Diabetes**

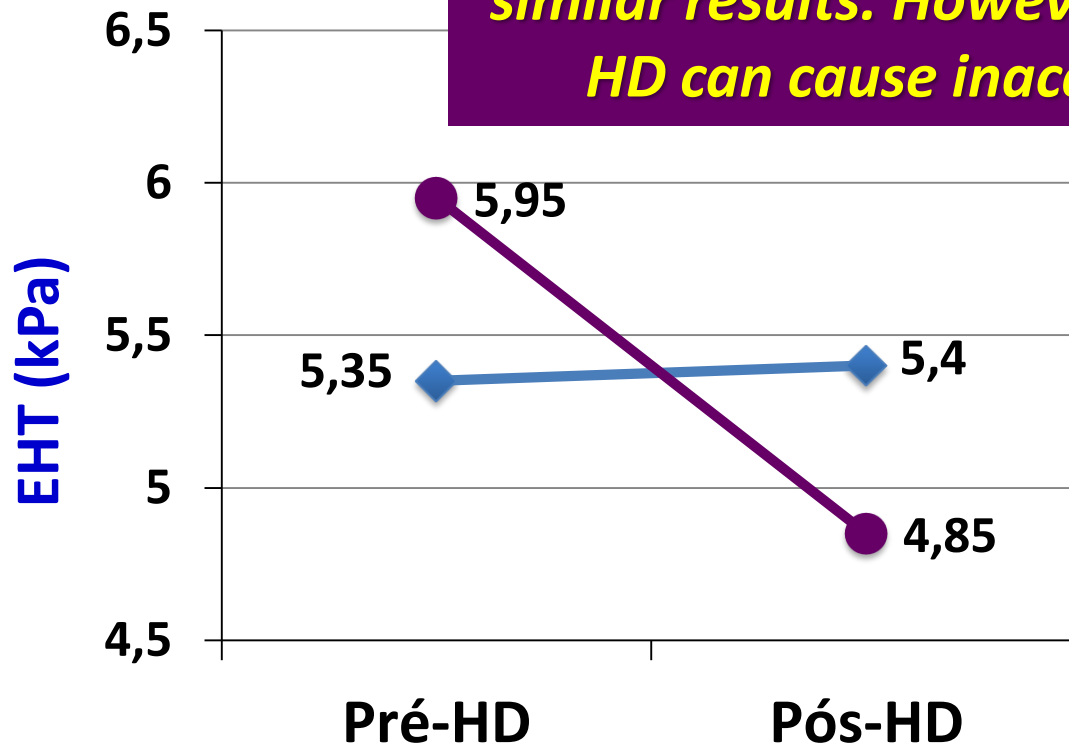
**Obesidade**

**[Fe]**

# FibroScan® em HD

✓ n = 36

*In ESRD on regular HD, LSM is not affected by HD. TE can be done before or after HD with similar results. However, fluid excess at pre-HD can cause inaccurately high LSM.*



# FibroScan® em HD

✓ n = 34, HD crônica, anti-HCV +.

## *Rigidez hepática e diagnóstico de DRC*

Fibrosis Stage	Fibroscan before hemodialysis (kPa)	Fibroscan after hemodialysis (kPa)	p value
F0	4,14±0,98	3,54±0,84	0,005
F1	6,22±0,39	5,47±0,58	0,001
F2	8.03±0,62	7,76±0,6	0,046
F3	10,9±1,08	10,82±1,02	0,259
F4	28,36±4,07	28,48±4,02	0,141

# FibroScan® em HD

✓ n = 68, há > 3 meses, com suspeita de hepatopatia.

## *Distribuição da rigidez hepática (kPa)*

80

### **Assessment of Liver Fibrosis by Transient Elastography Should Be Done After Hemodialysis in End Stage Renal Disease Patients with Liver Disease**

Sunil Taneja<sup>1</sup> · Amritangsu Borkakoty<sup>1</sup> · Sahaj Rathi<sup>1</sup> · Vivek Kumar<sup>2</sup> ·  
Ajay Duseja<sup>1</sup> · Radha K. Dhiman<sup>1</sup> · Krishan L. Gupta<sup>2</sup> · Yogesh Chawla<sup>1</sup>

20



**FS 1**

(< 2h da HD)

**FS 2**

(até 12h pós-HD)

# FibroScan® em TxR

✓ n = 73, há > 1 ano

## *Correlação com a rigidez hepática*

Characteristic	Mean $\pm$ SD	R	P
Age (y)	56.3 $\pm$ 9.8	0.105	NS
Hemoglobin (g/L)	131.5 $\pm$ 15.8	-0.149	NS
Iron ( $\mu$ mol/L)	13.5 $\pm$ 4.7	-0.270	.02
AST (IU/L)	19.2 $\pm$ 6	0.100	NS
ALT (IU/L)	21.1 $\pm$ 12.6	0.161	NS
ALP (IU/L)	76.2 $\pm$ 24.9	0.151	NS
GGT (IU/L)	28.3 $\pm$ 20.7	0.122	NS
Total cholesterol (mmol/L)	5.4 $\pm$ 1.4	-0.101	NS
Triglycerides (mmol/L)	1.9 $\pm$ 0.9	0.036	NS
BMI (kg/m <sup>2</sup> )	26 $\pm$ 1.6	0.115	NS
Albumin (g/L)	38.9 $\pm$ 3	-0.194	NS
C-reactive protein (mg/L)	2.5 $\pm$ 2.1	0.319	.008
Creatinine ( $\mu$ mol/L)	130.9 $\pm$ 57.1	0.392	.001

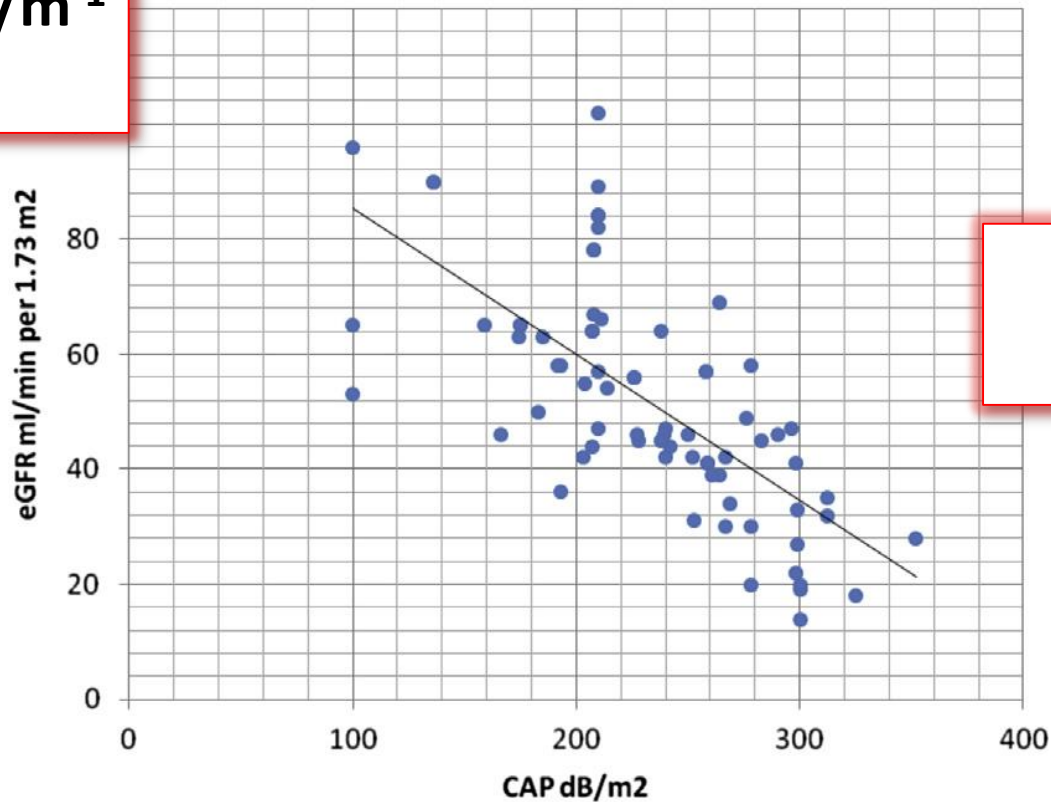
Abbreviations: AST, aspartate aminotransferase; ALT, alanine aminotransferase; ALP, alkaline phosphatase; GGT,  $\gamma$ -glutamyltransferase; BMI, bone marrow index.

# FibroScan® em TxR

✓ n = 73, há > 1 ano

## Correlação CAP x TFG

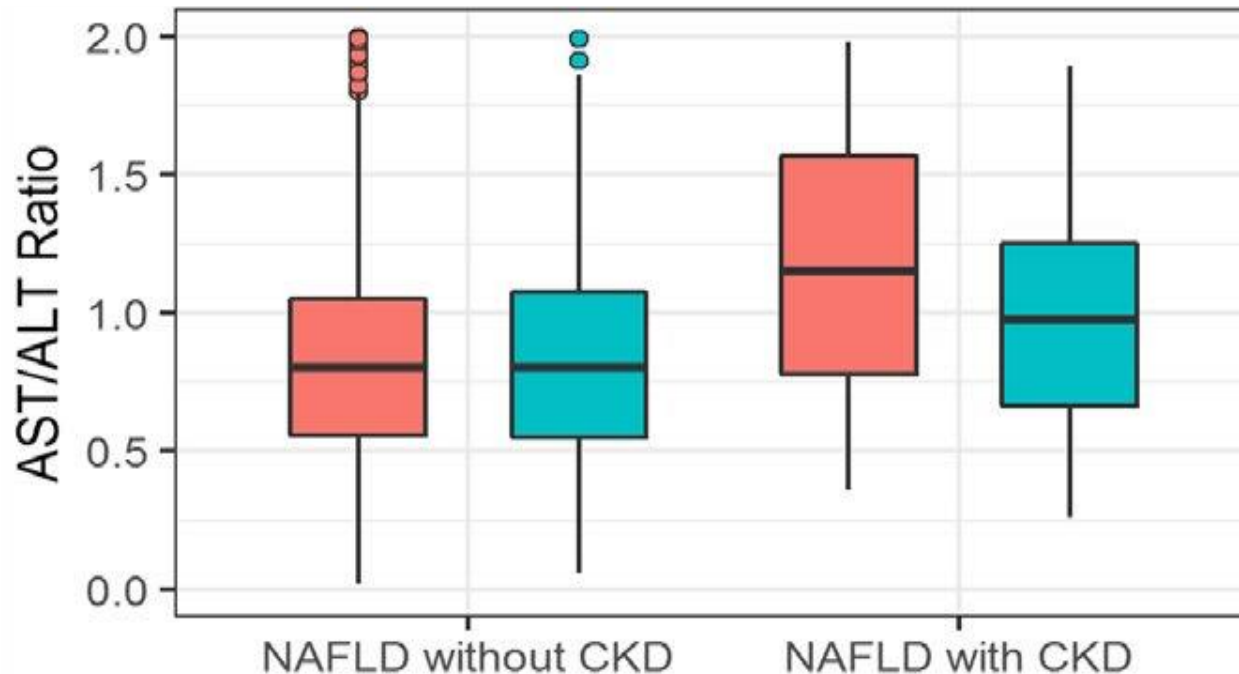
**CAP  $\geq 238$  dB/m<sup>-1</sup>  
em 57%**



**r = - 0,692  
p 0,0001**

# FibroScan® e DRC em NAFLD

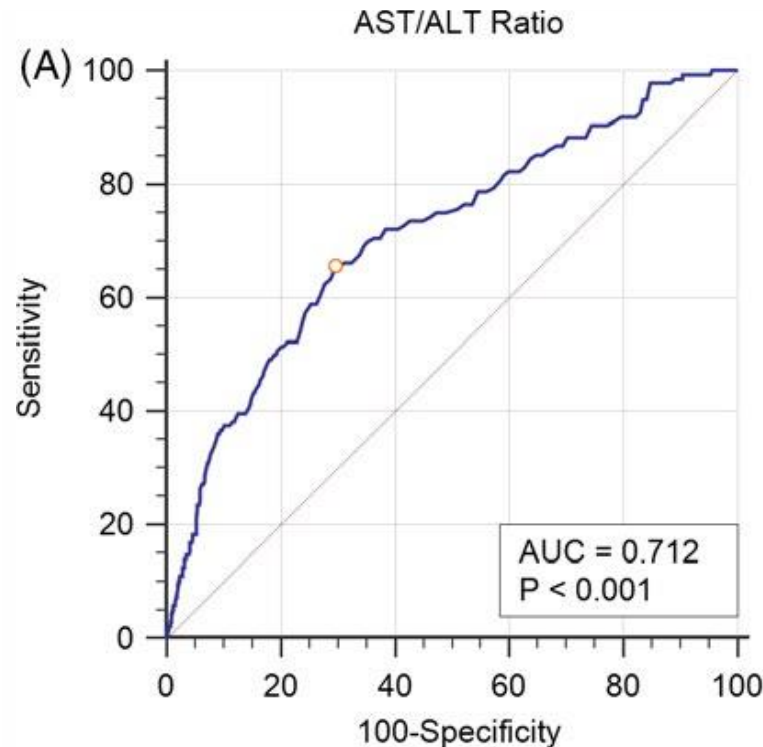
✓ n = 1415, USG com esteatose.



# FibroScan® e DRC em NAFLD

✓ n = 1415, USG com esteatose.

## *Rigidez hepática e diagnóstico de DRC*





# FibroScan® e DRC em NAFLD

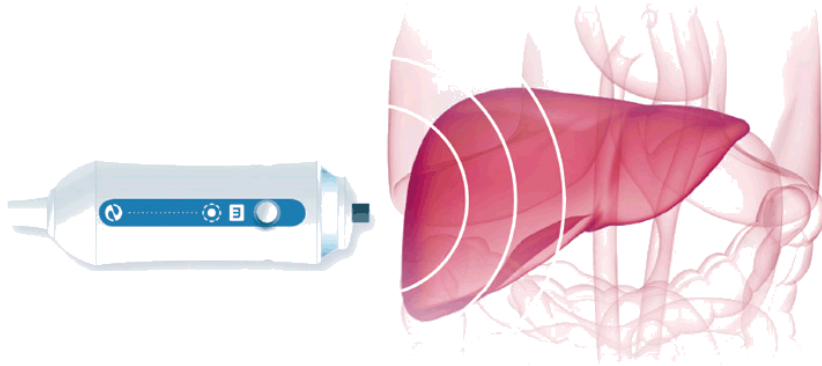
✓ n = 1415, USG com esteatose.

## *Rigidez hepática e diagnóstico de DRC*

Variables	Comparison	Multivariate analysis on the risk of CKD		
		OR	95% CI OR	P value
Age	Per unit increase	1.19	1.14-1.24	<0.05*
Diabetes mellitus	Yes vs No	1.88	1.16-3.02	<0.05*
Serum uric acid	Per unit increase	1.01	1.008-1.013	<0.05*
Liver stiffness	Per unit increase	1.31	1.21-1.43	<0.05*

\*Statistically significant difference.

# TNIFs em DRC (HD ou TxR)



***APRI & FIB-4***

- ✓ Sobrecarga de volume
- ✓ Congestão por IC
- ✓ Sobrecarga de ferro
- ✓ Esteatose
- ✓ ALT e AST ↓

**Associar  
TNIFs!!!**



# APRI em HCV com DRC em HD

HEPATOLOGY 2007;46:307-314

## Simple Blood Tests as Noninvasive Markers of Liver Fibrosis in Hemodialysis Patients with Chronic Hepatitis C Virus Infection

Leonardo L. Schiavon,<sup>1</sup> Janaína L. N. Schiavon,<sup>1</sup> Roberto J. Carvalho Filho,<sup>1</sup> Juliana P. Sampaio,<sup>1</sup> Valéria P. Lanzoni,<sup>2</sup>

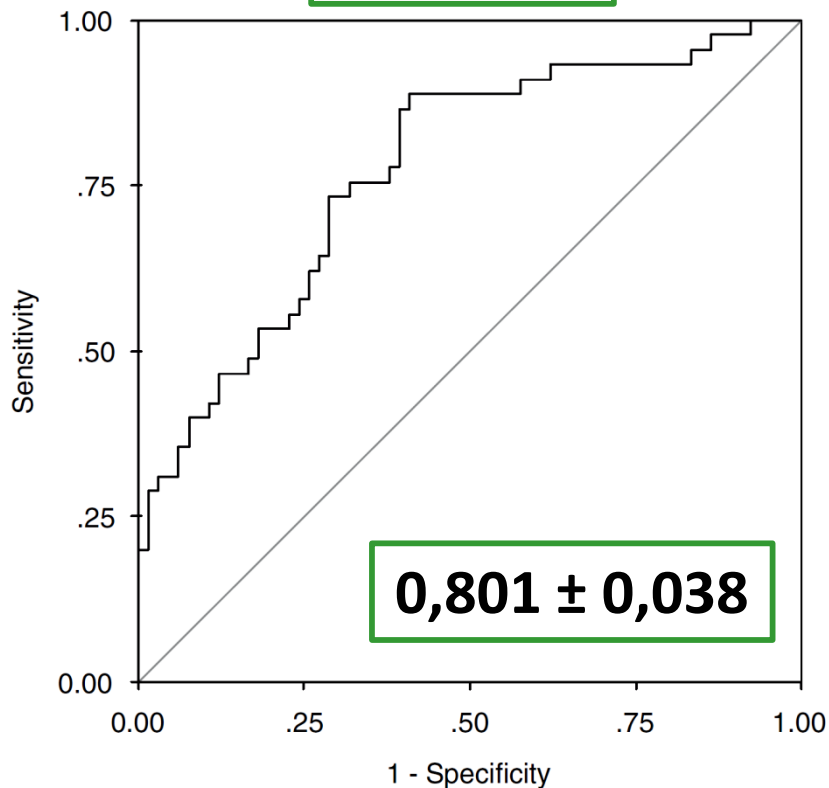
Antonio Eduardo B. Silva,<sup>1</sup> and Maria Lucia G. Ferraz<sup>1</sup>

		All Patients (n = 203) n (%)	Actual Fibrosis		Accuracy (%)	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)
			F0-F1 (n = 155)	F2-F4 (n = 48)					
Significant fibrosis	< 0.40	90 (44)	84 (54)	6 (12)	62	88	54	37	93
	≥ 0.40	113 (56)	71 (46)	42 (88)					
	< 0.95	171 (84)	144 (93)	27 (56)					
	≥ 0.95	32 (16)	11 (7)	21 (44)	81	44	93	66	84
			F0-F2 (n = 184)	F3-F4 (n = 19)					
Avanced fibrosis	≤ 0.55	127 (63)	126 (69)	1 (5)	71	95	69	24	99
	> 0.55	76 (37)	58 (31)	18 (95)					
	< 1.00	175 (86)	164 (89)	11 (58)					
	≥ 1.00	28 (14)	20 (11)	8 (42)	85	42	89	29	94

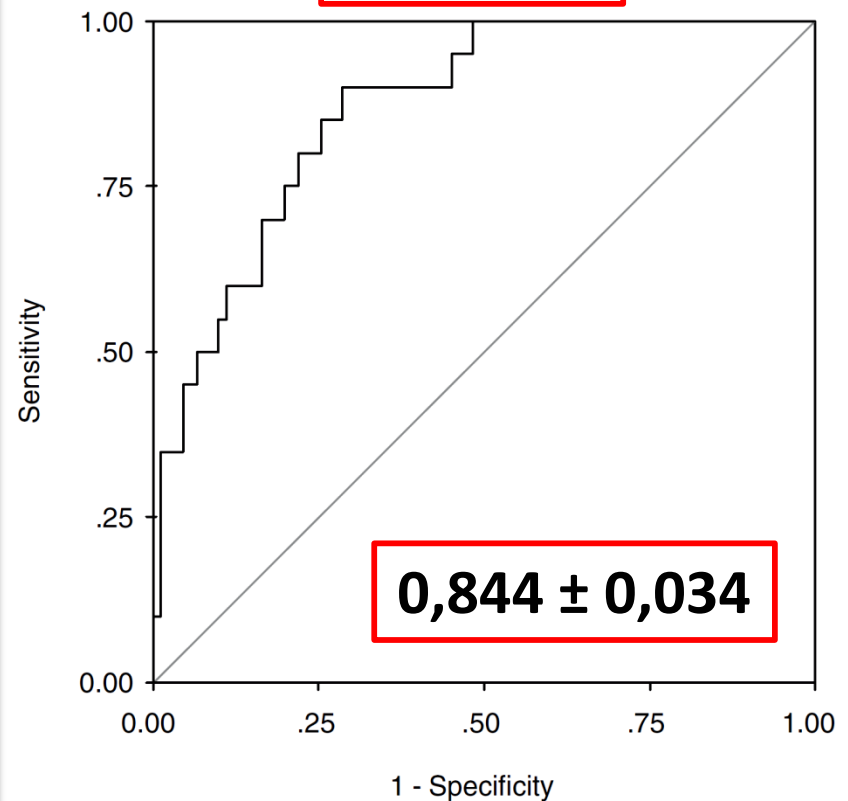
# APRI em HCV com DRC em HD

n = 203

< 0,40  $F \geq 2$   $\geq 0,95$



$\leq 0,55$   $F \geq 3$   $\geq 1,0$



# Tx3 em HCV com DRC pós-TxR

JOURNAL OF VIRAL HEPATITIS

JVH

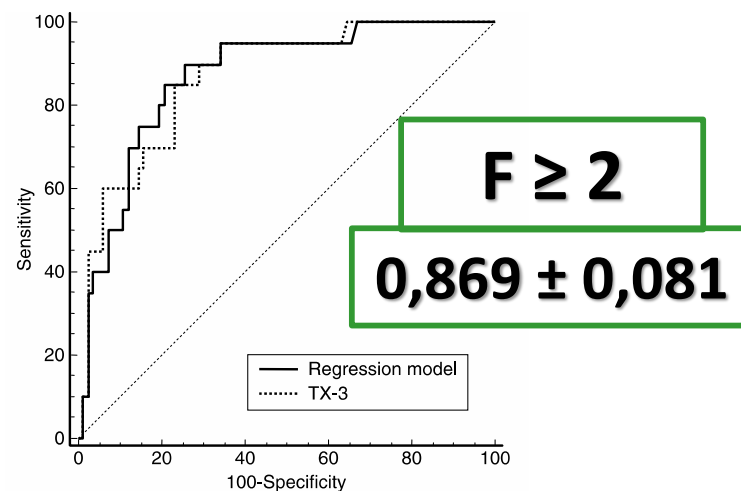
*Journal of Viral Hepatitis*, 2010, 17, 391–399

doi:10.1111/j.1365-2893.2009.01190.x

## Prediction of significant liver fibrosis in kidney transplant patients with chronic hepatitis C virus infection: the TX-3 index

L. L. Schiavon,<sup>1</sup> R. J. Carvalho-Filho,<sup>1</sup> J. L. Narciso-Schiavon,<sup>1</sup> S. R. Pinheiro,<sup>1</sup> D. V. Barbosa,<sup>1</sup> V. P. Lanzoni,<sup>2</sup> M. L. G. Ferraz<sup>1</sup> and A. E. B. Silva<sup>1</sup> <sup>1</sup>Division of Gastroenterology, Hepatitis Section; and <sup>2</sup>Department of Pathology, Federal University of Sao Paulo, Sao Paulo, Brazil

$$\text{TX3} = \text{Tempo de TxR (anos)} \times \text{AST (xLSN)} / \text{PLA (x10}^3\text{)} \times 100$$



# Elastografia na DRC

- ✓ Ferramenta promissora para rastrear hepatopatia na HD.
- ✓ Boa acurácia para estimar fibrose na hepatite C crônica.
- ✓ Potencial aplicabilidade para o CAP.
- ✓ Fazer EH com peso corporal próximo do peso seco.
- ✓ Outros fatores confundidores: jejum, Fe, ICC, etc.
- ✓ Associar EH + testes séricos pode ser útil.





# Obrigado...



Gastroenterologia  
Hepatologia

