



HEPATO 2019
XXV CONGRESSO BRASILEIRO
DE 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

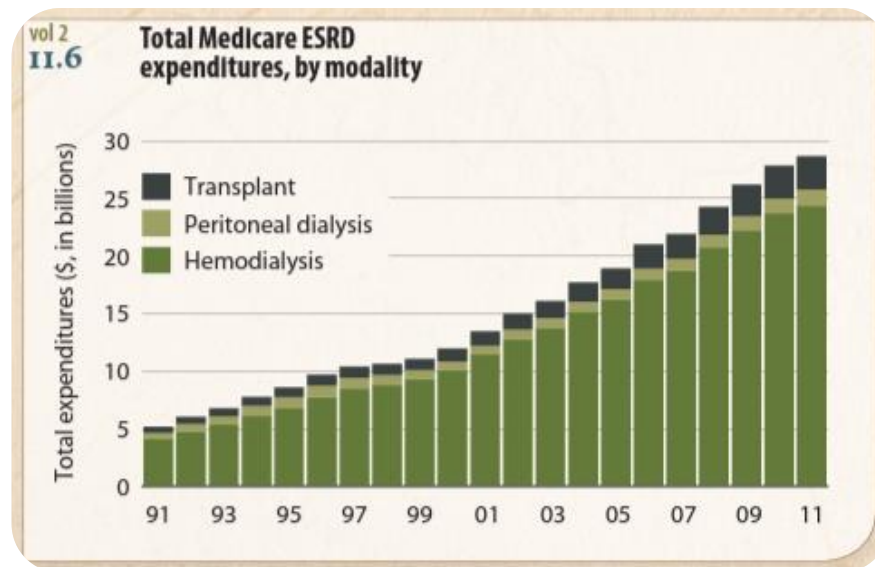
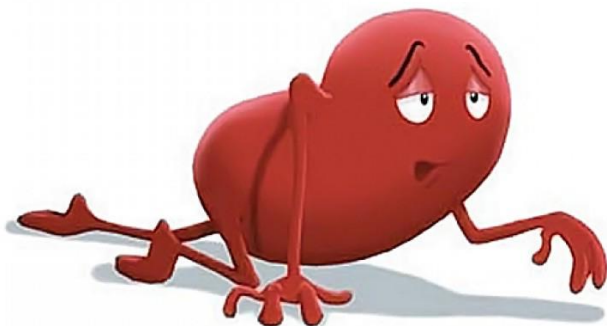
Conflitos de interesse



0%

Doença renal crônica (DRC)

- ✓ Prevalência mundial: 8 a 16%¹
- ✓ Mortalidade:²
 - 1990: 27.^a causa (15,7 óbitos/100.000/ano)
 - 2010: 18.^a causa (16,3 óbitos/100.000/ano)
- ✓ Impacto econômico:
 - EUA, 2011: 30 bilhões/ano³

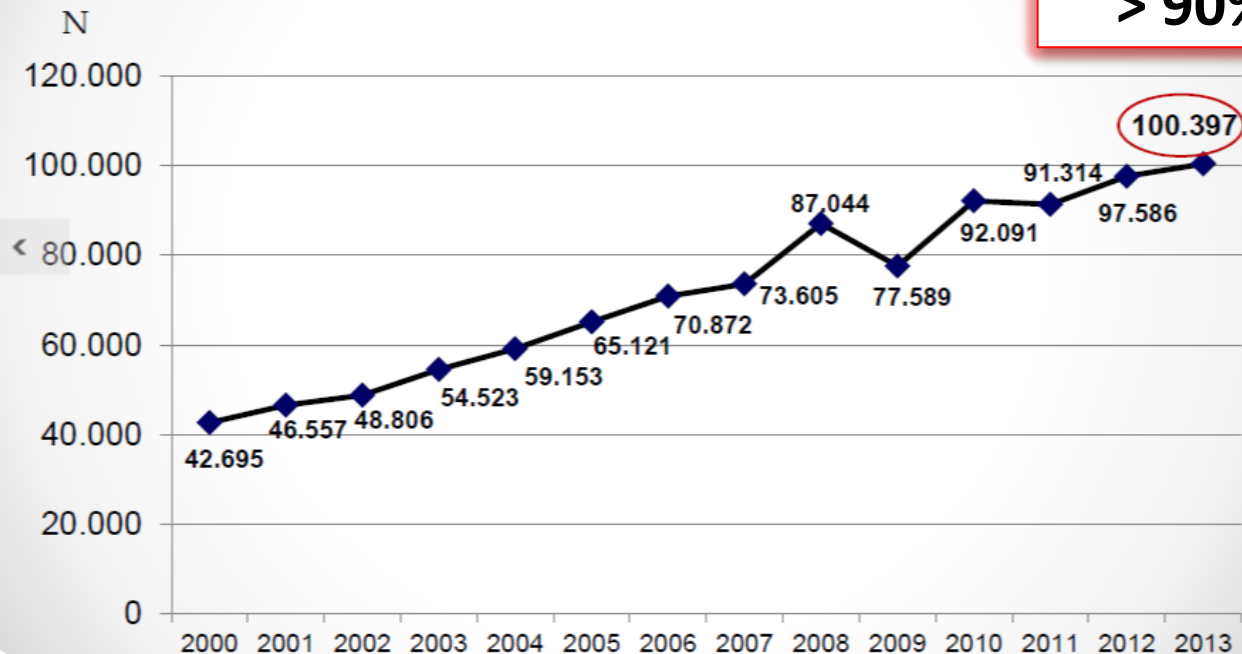


DRC em HD no Brasil



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

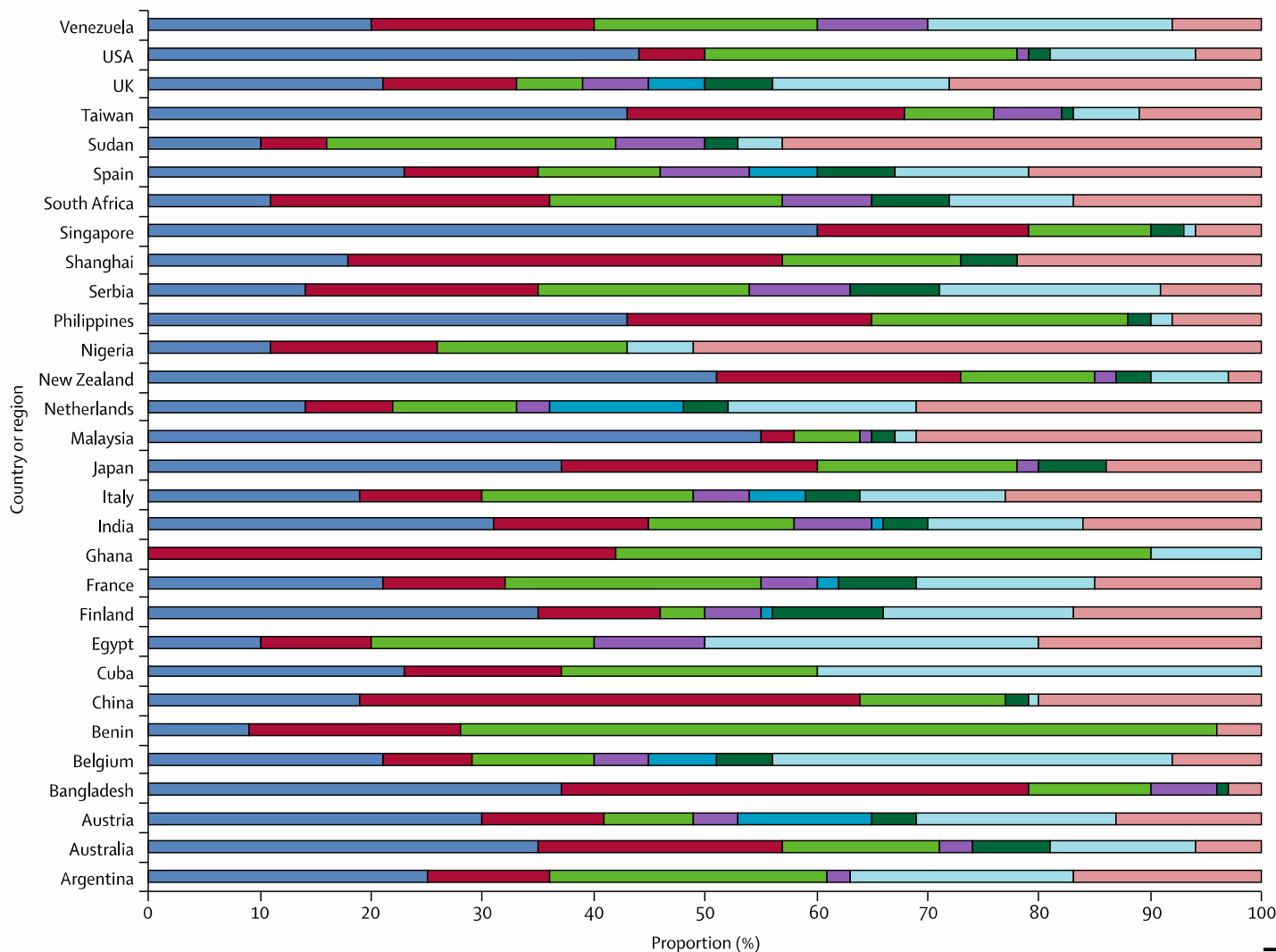
✓ **Disfunção renal: TFG <60 mL/min/1,73 m²**

	eTFG* (mL/min/1,73 m ²)	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

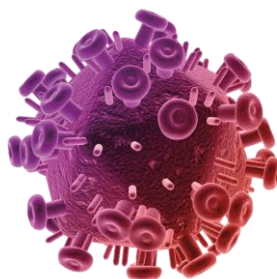
INDET

Fígado e Rim: *ligações perigosas...*

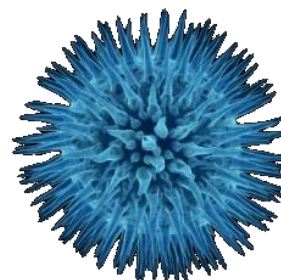
Lesões renais nas hepatopatias



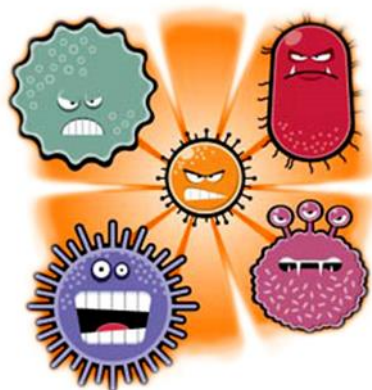
HCV



HBV



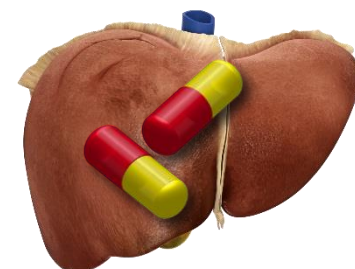
HEV



Infecções
oportunistas

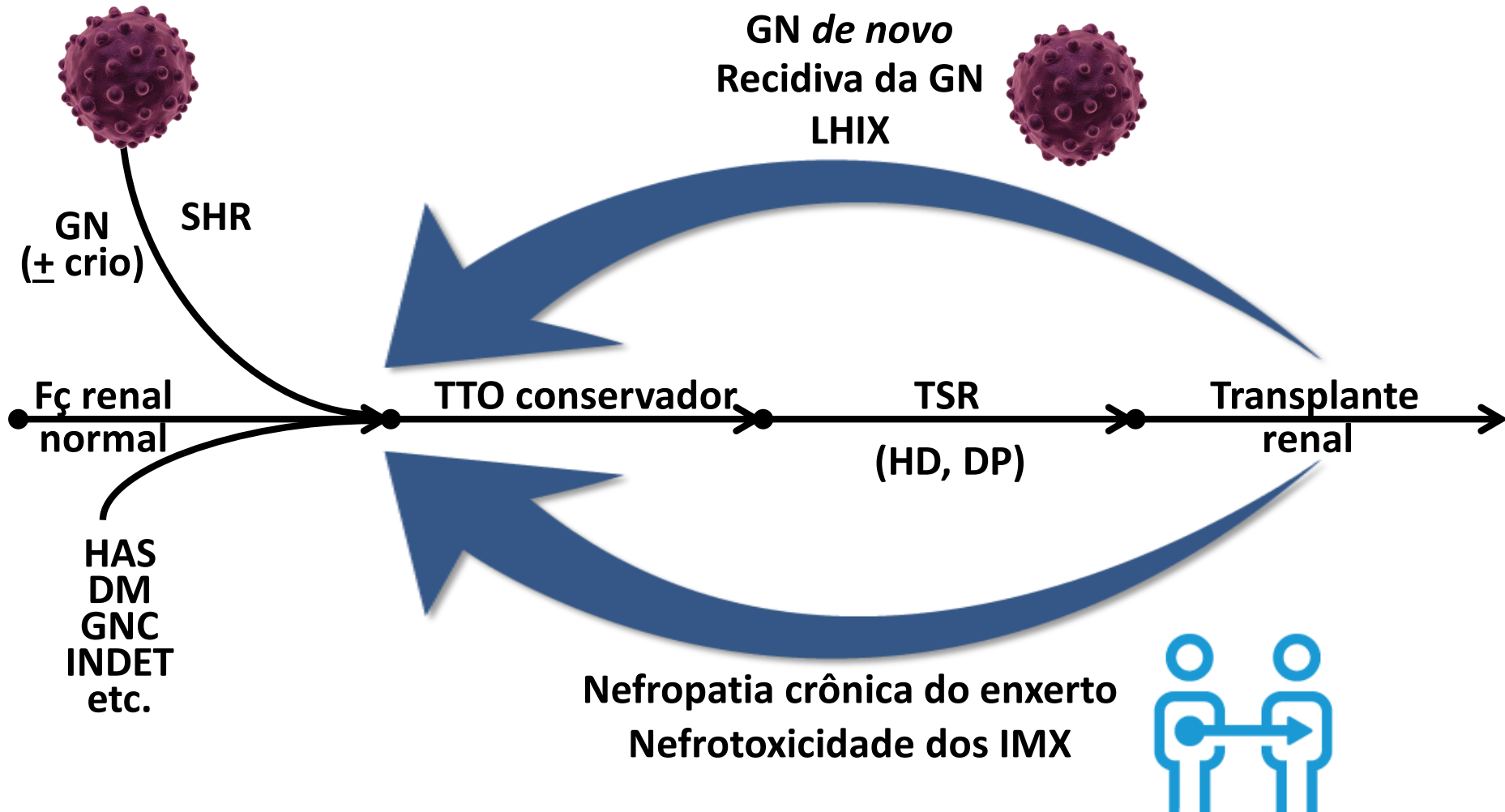


Disfunção
renal na
cirrose



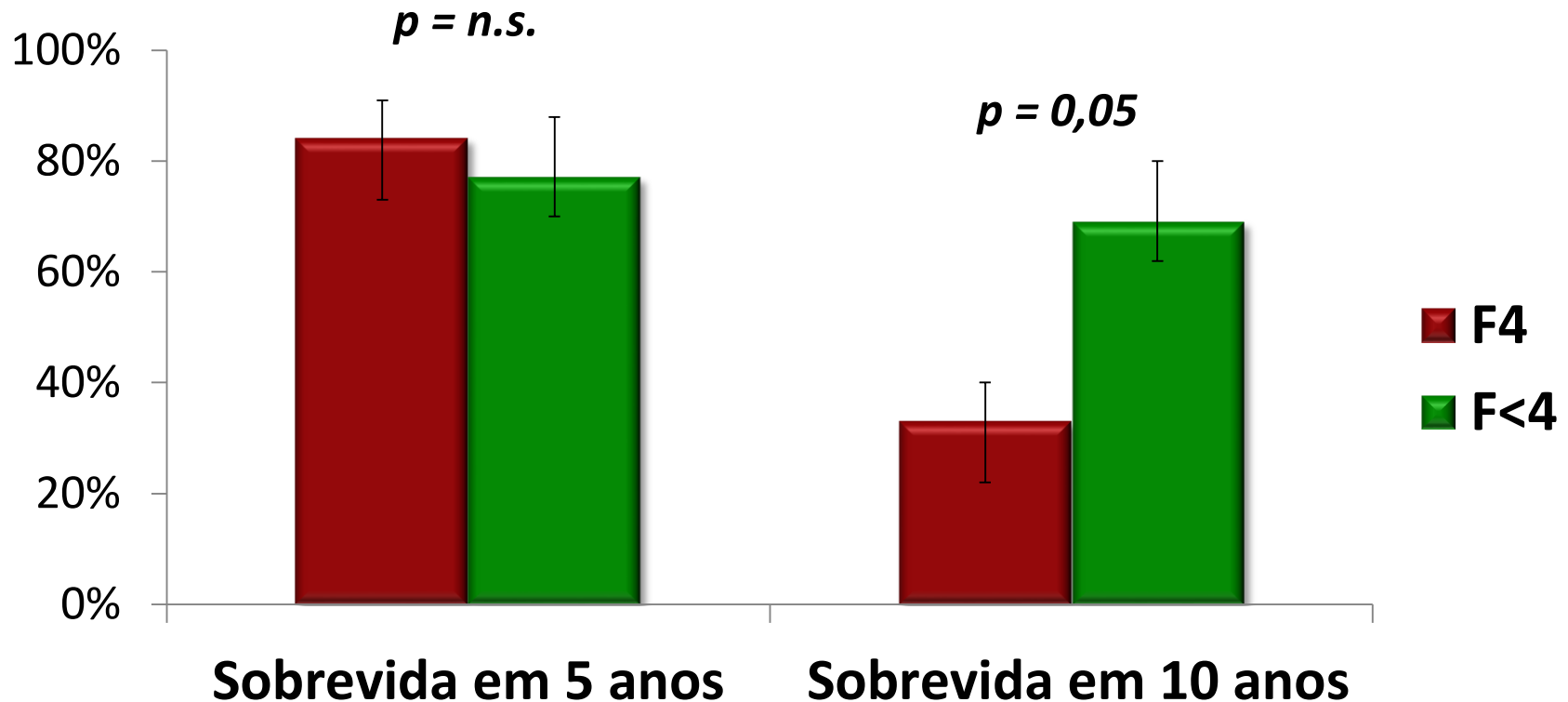
LHID

Impacto na HN da DRC



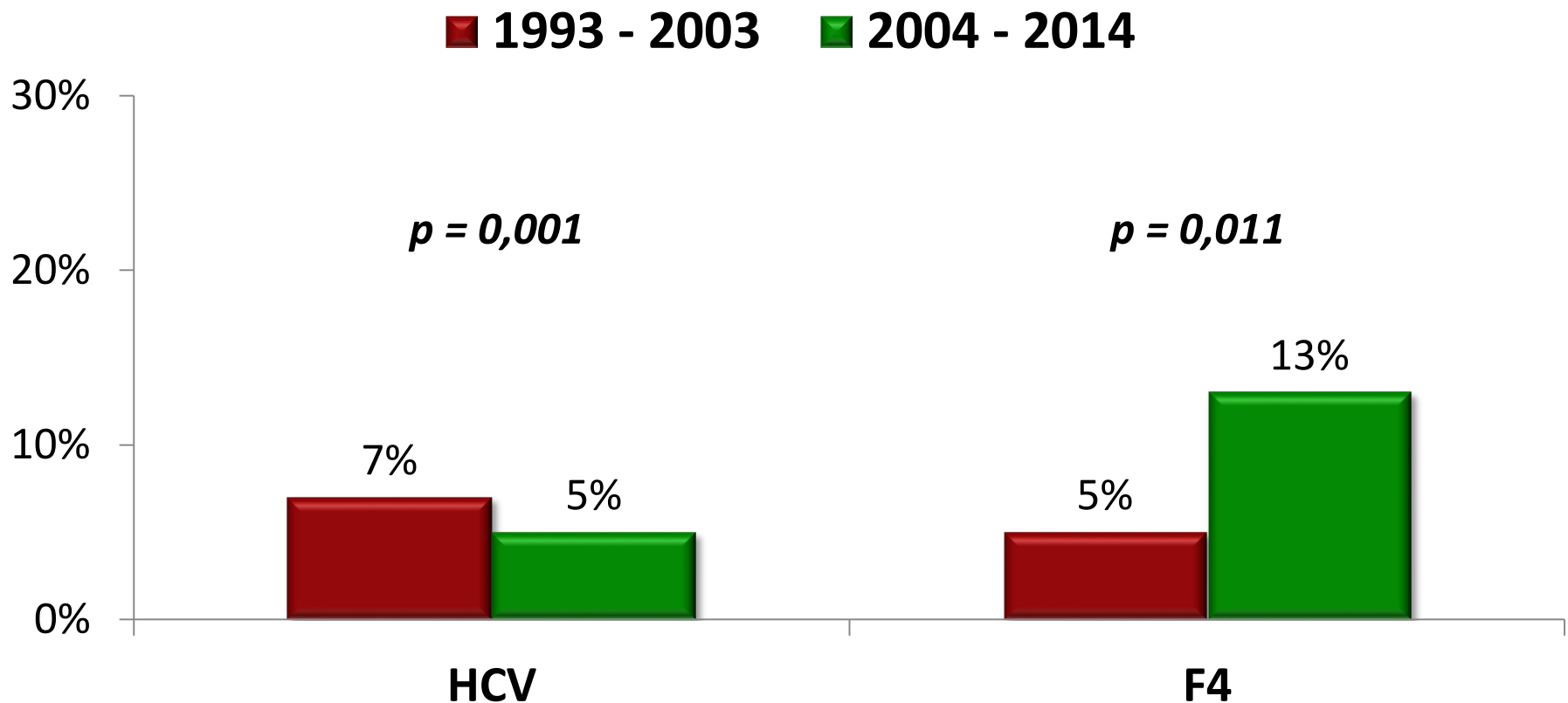
Hepatopatia e transplante renal

Cirrose = menor sobrevida pós-TxR



Hepatopatia e transplante renal

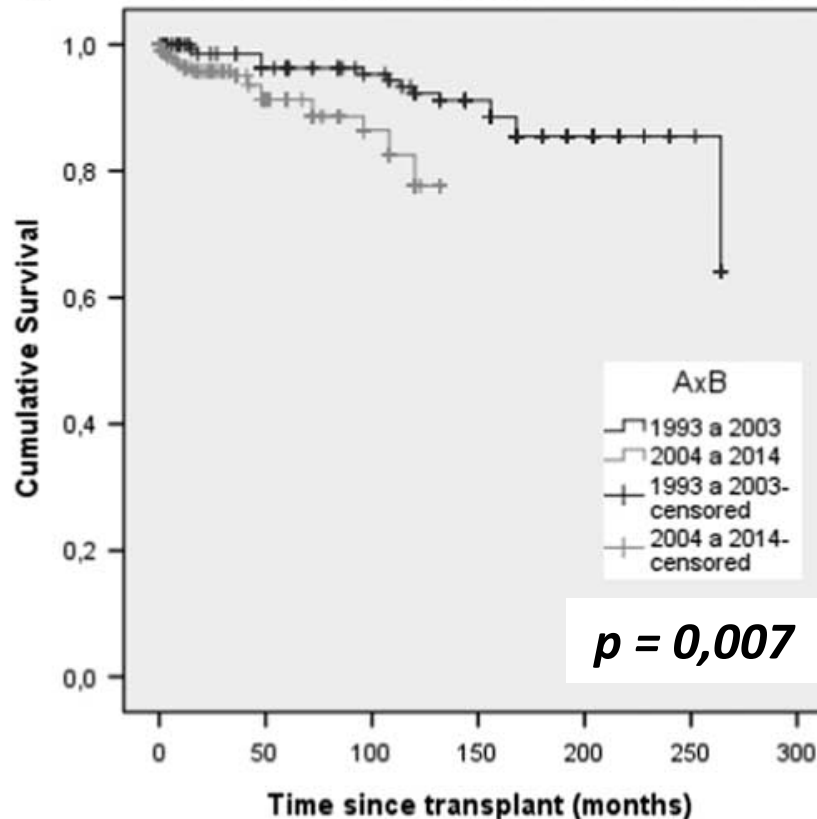
✓ n = 11.715



Hepatopatia e transplante renal

✓ n = 11.715

Descompensação hepática



Hepatopatia e transplante renal

✓ n = 11.715

Descompensação hepática

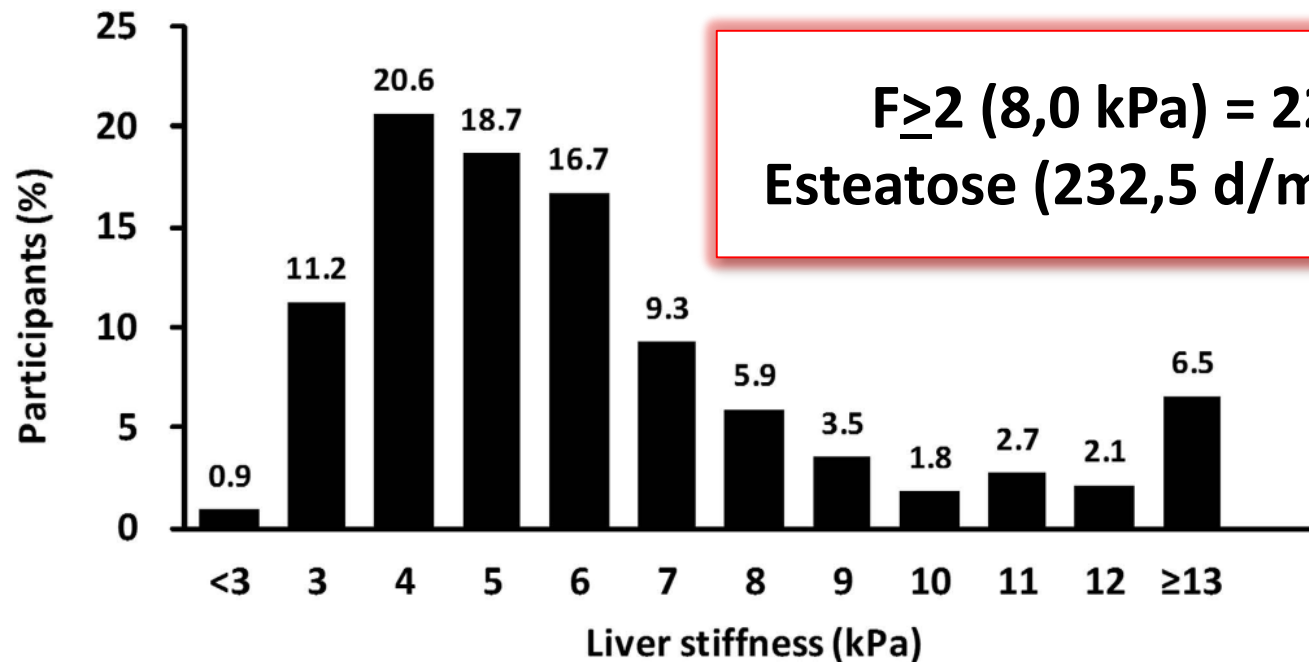
	Initial model		Final model	
	HR (95% CI)	P	HR (95% CI)	P
Age (years)	1.002 (0.968–1.037)	0.912	–	–
Group (A × B)	0.875 (0.288–2.660)	0.814	–	–
Sex (female × male)	0.551 (0.234–1.297)	0.172	–	–
Pre-RTx HCV treatment (yes × no)	1.622 (0.670–3.924)	0.283	–	–
Use of ciclosporina (yes × no)	0.424 (0.128–1.411)	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.

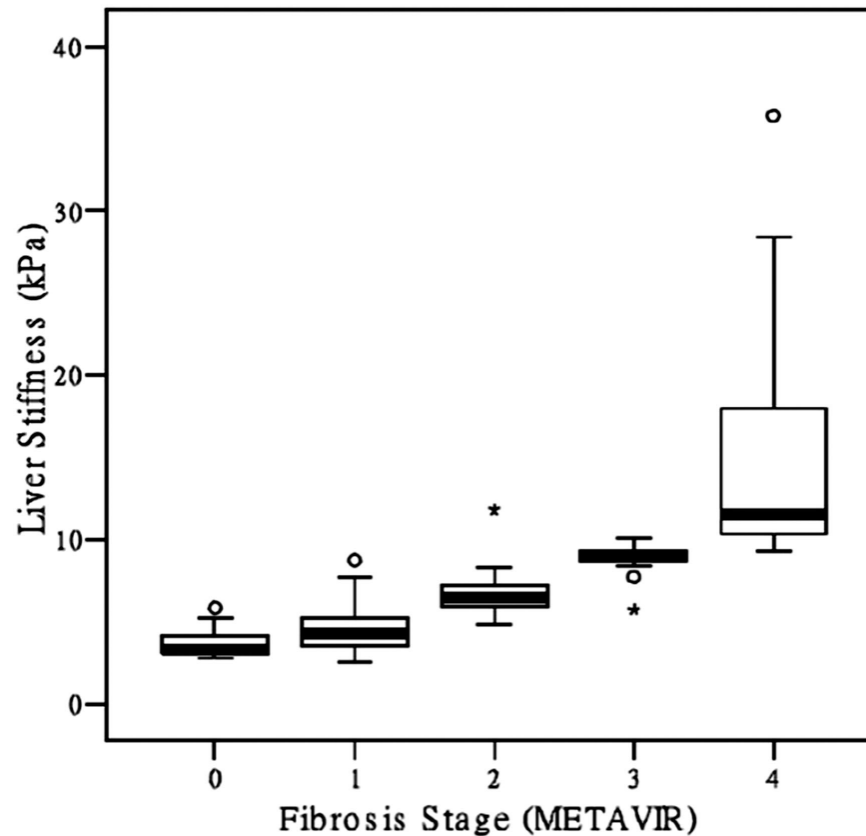
Distribuição da rigidez hepática (kPa)



$F_{\geq 2}$ (8,0 kPa) = 22,6%
Esteatose (232,5 d/m⁻¹) = 50%

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 _{≥2}	0,96	0,84	<0,001
F _{≥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 _{≥2}	F _{≥3}	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

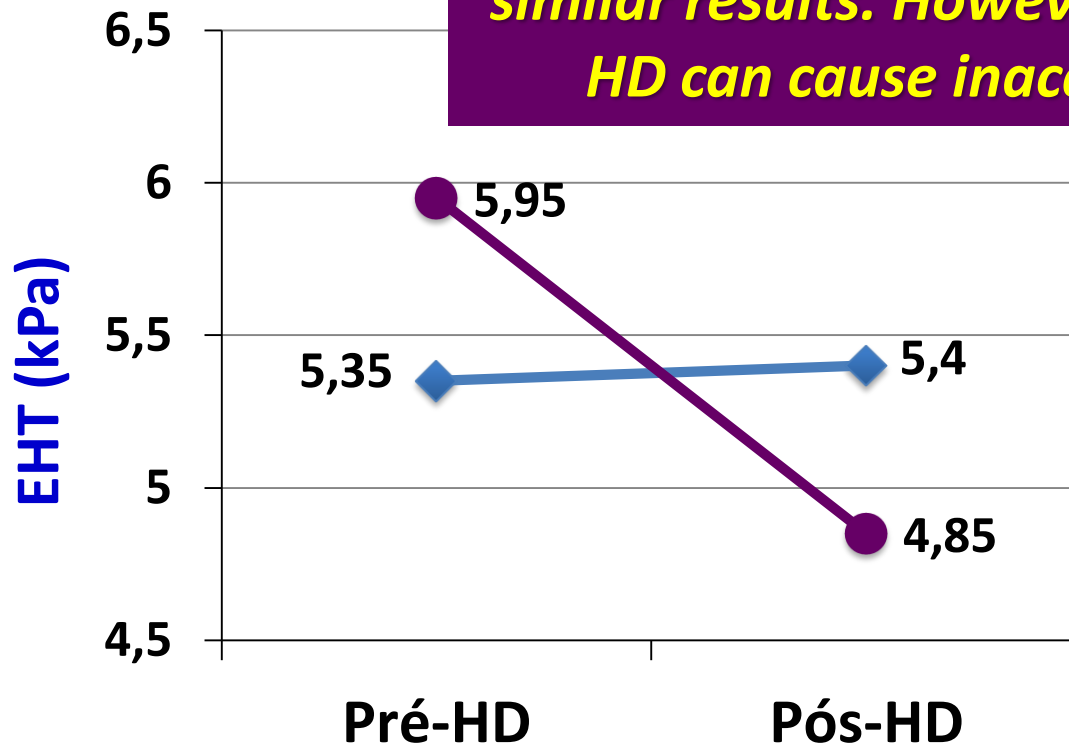
Obesidade

[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 Taneja¹ · Amritangsu Borkakoty¹ · Sahaj Rathi¹ · Vivek Kumar² ·
Ajay Duseja¹ · Radha K. Dhiman¹ · Krishan L. Gupta² · Yogesh Chawla¹

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

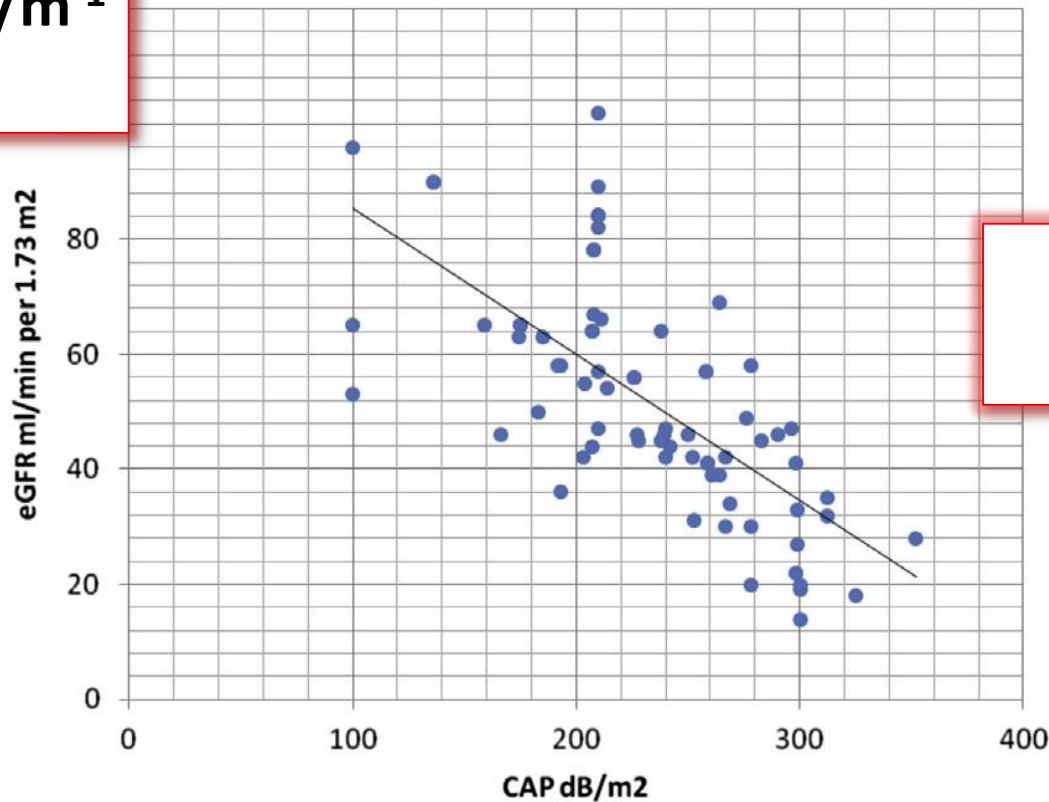
Abbreviations: AST, aspartate aminotransferase; ALT, alanine aminotransferase; ALP, alkaline phosphatase; GGT, γ-glutamyltransferase; BMI, bone marrow index.

FibroScan® em TxR

✓ $n = 73$, há > 1 ano

Correlação CAP x TFG

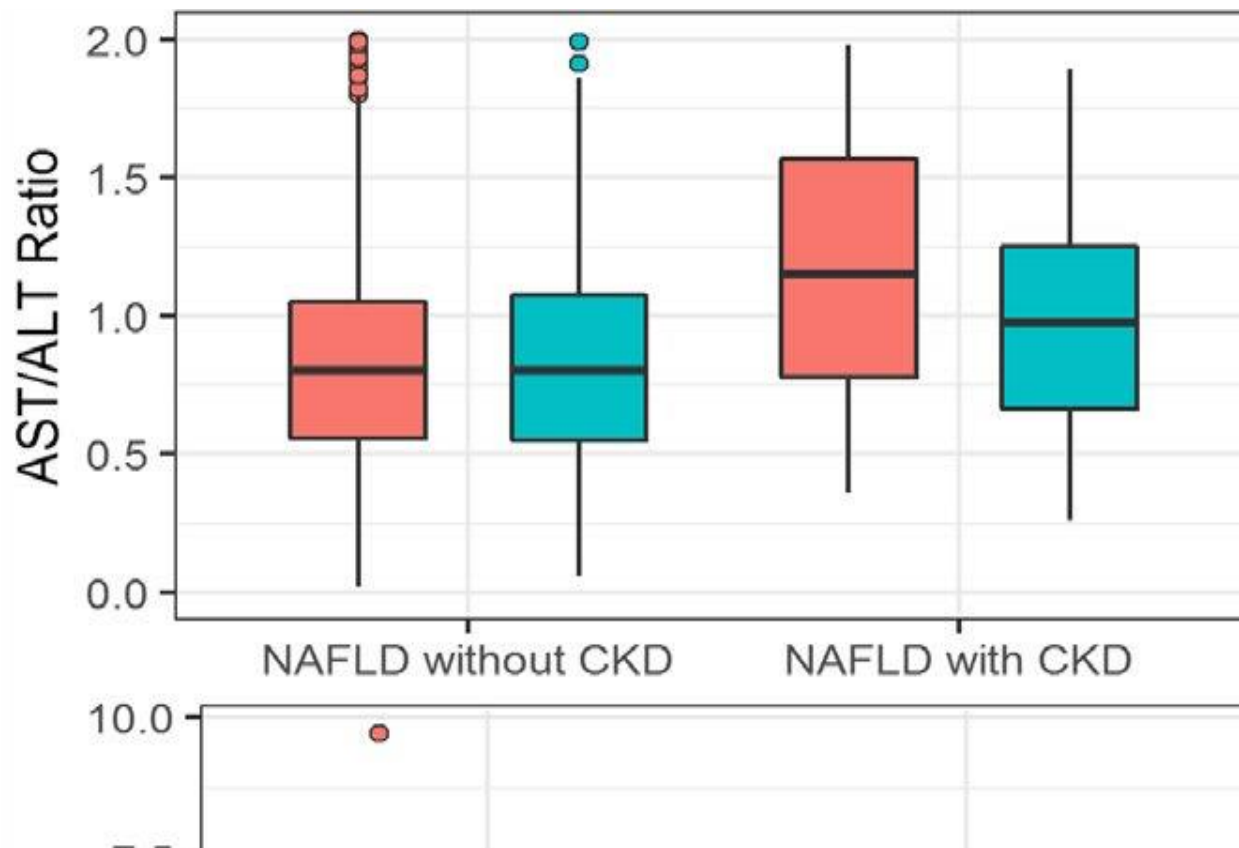
$CAP \geq 238 \text{ dB/m}^{-1}$
em 57%



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

FibroScan® e DRC em NAFLD

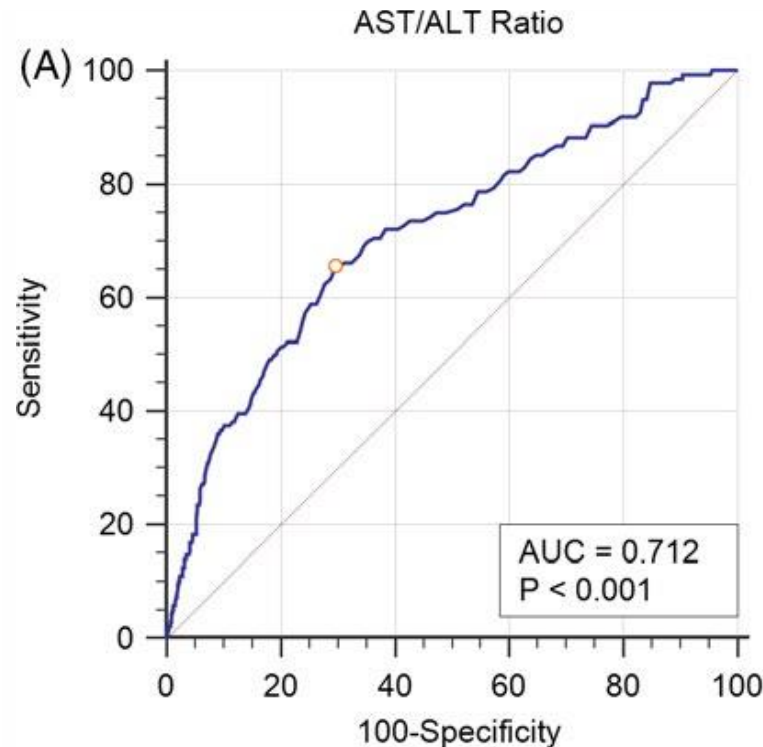
✓ n = 1415, USG com esteatose.



FibroScan® e DRC em NAFLD

✓ n = 1415, USG com esteatose.

Rigidez hepática e diagnóstico de DRC



FibroScan® e DRC em NAFLD

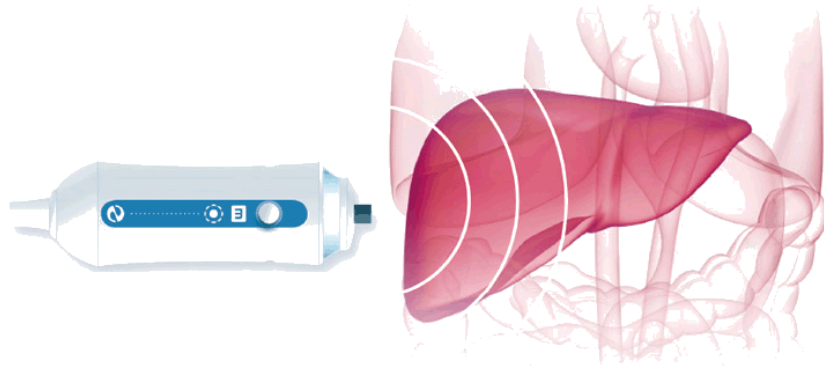
✓ n = 1415, USG com esteatose.

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,¹ Janaína L. N. Schiavon,¹ Roberto J. Carvalho Filho,¹ Juliana P. Sampaio,¹ Valéria P. Lanzoni,²

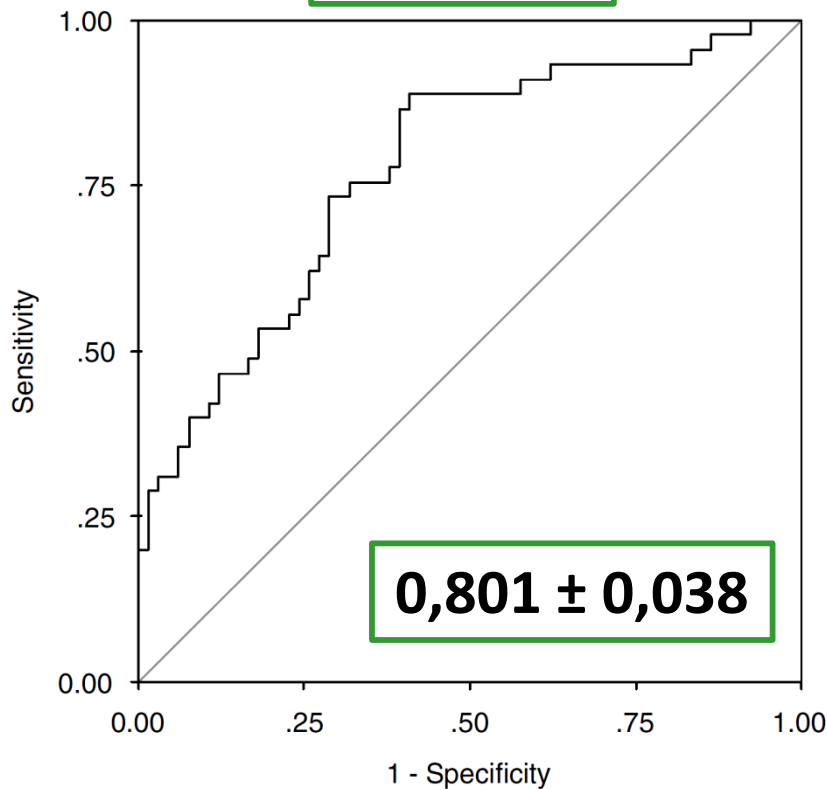
Antonio Eduardo B. Silva,¹ and Maria Lucia G. Ferraz¹

		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

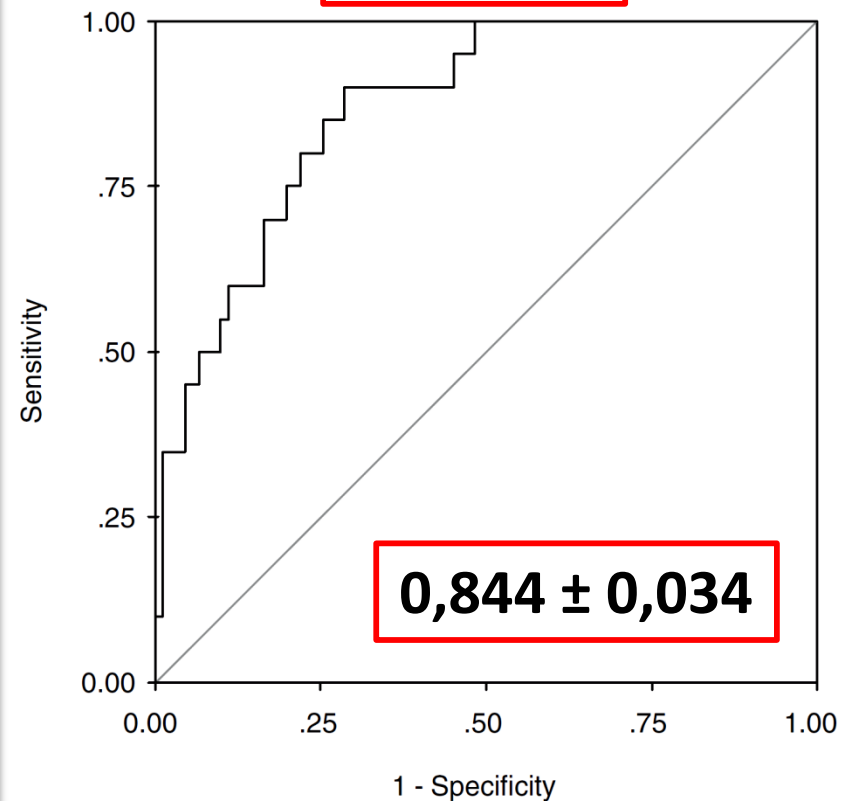
APRI em HCV com DRC em HD

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

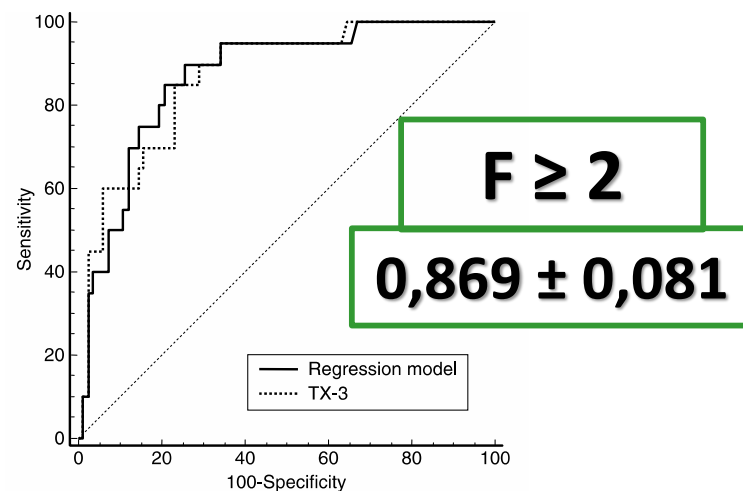
Journal of Viral Hepatitis, 2010, 17, 391–399

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,¹ R. J. Carvalho-Filho,¹ J. L. Narciso-Schiavon,¹ S. R. Pinheiro,¹ D. V. Barbosa,¹ V. P. Lanzoni,² M. L. G. Ferraz¹ and A. E. B. Silva¹ ¹Division of Gastroenterology, Hepatitis Section; and ²Department of Pathology, Federal University of Sao Paulo, Sao Paulo, Brazil

$$\text{TX} = 3 \frac{1}{4} \text{ Time since transplantation (years)} \times \frac{\text{AST (xULN)}}{\text{Platelet count} \times 10^9 \text{L}^{-1}} \times 100$$



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

