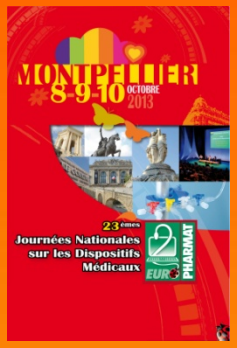


Suppléance Hépatique

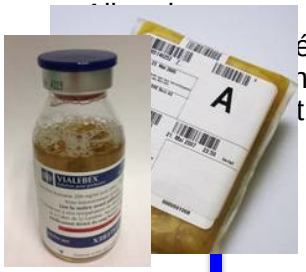
Fouad BELAFIA
Service d'anesthésie Réanimation Saint Eloi (Pr Jaber)
Unité de réanimation et transplantation hépatique
Hôpital saint Eloi
Montpellier

CHRU MONTPELLIER
CENTRE HOSPITALIER REGIONAL UNIVERSITAIRE

UM1
Université Montpellier 1

fonction glycogénique

synthèse protéique



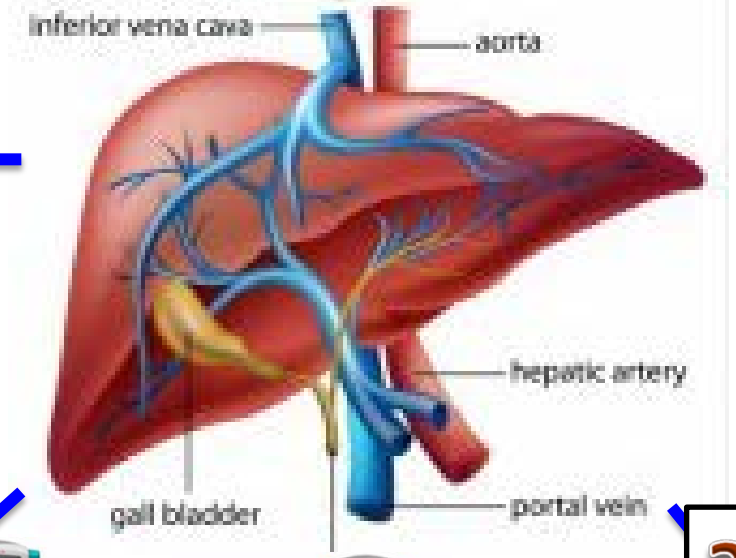
émostase
nsport
t facteurs

Catabolisme protéique

NH4+ en Urée (+ glutamine)

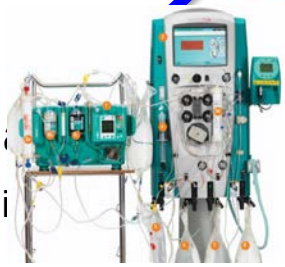
Lipides

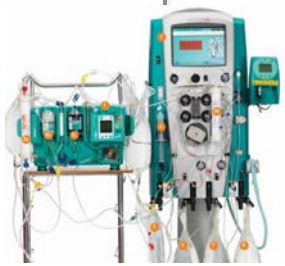
Synthèse apo s
tasie érol et TG
trans Vitamines Lipo



Fonction bili e

Bile et acides bili





Biotransformation des médicaments

Fonction de détoxication

fonction glycogénique

synthèse protéique

Albumine
Protéines de l'hémostase
Protéines de transport
l'inflammation et facteurs de croissance

***Catabolisme* protéique**

NH_4^+ en Urée (+ glutamine)

Lipides

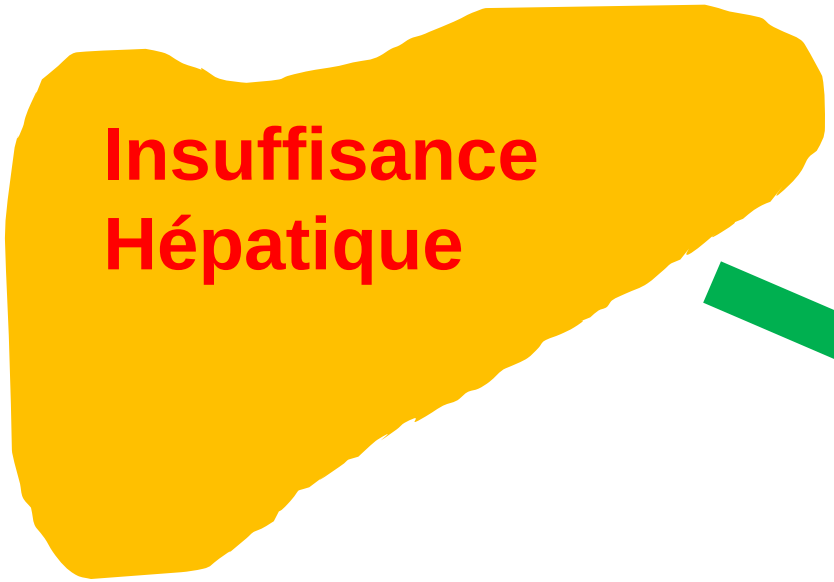
Synthène apoproteines
Homéostasie Cholestérol et TG
Stock et transf Vitamines Lipo

Fonction biliaire *exocrine*

Bile et acides biliaires

Fonction de détoxication

Biotransformation des médicaments

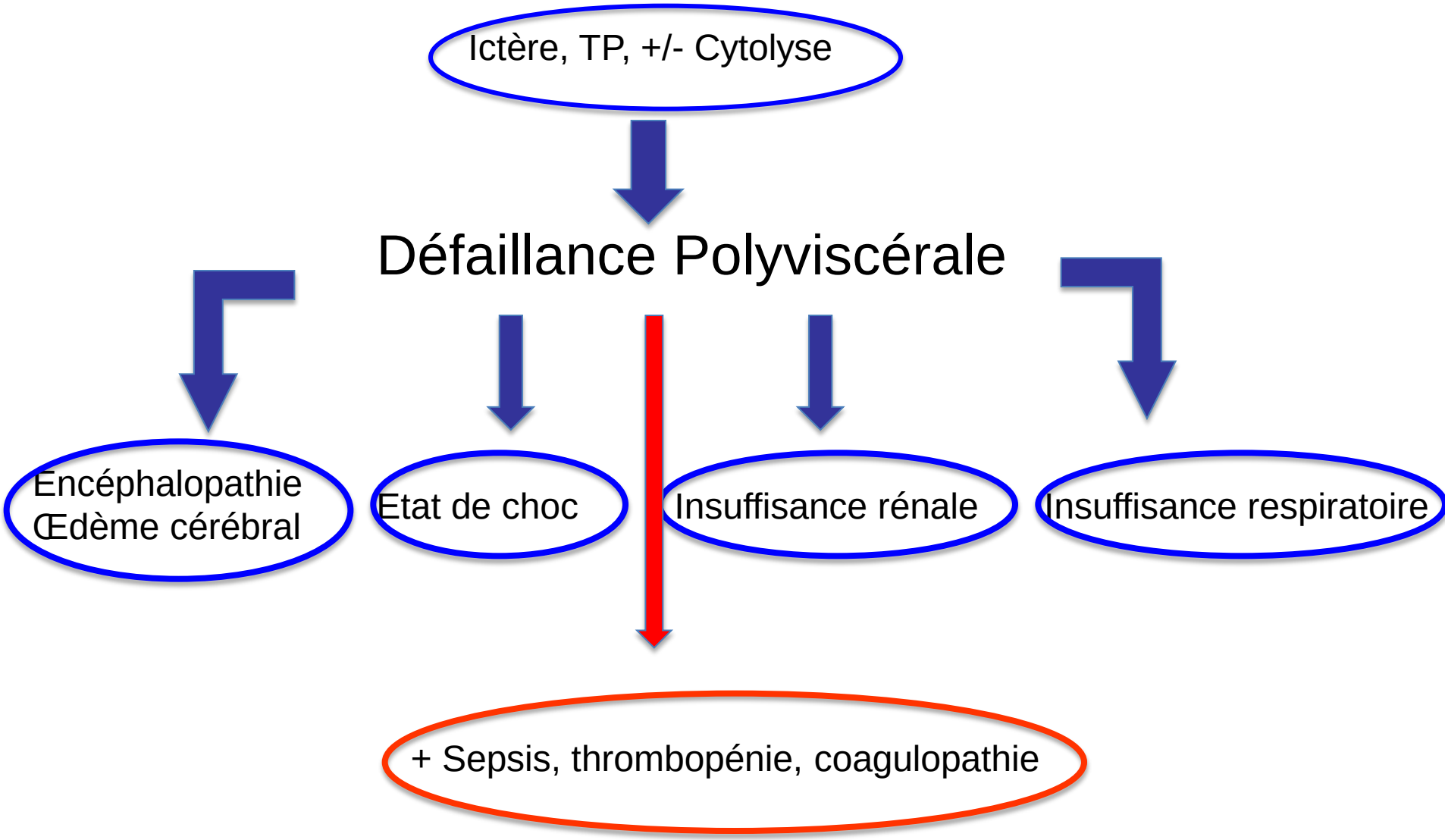


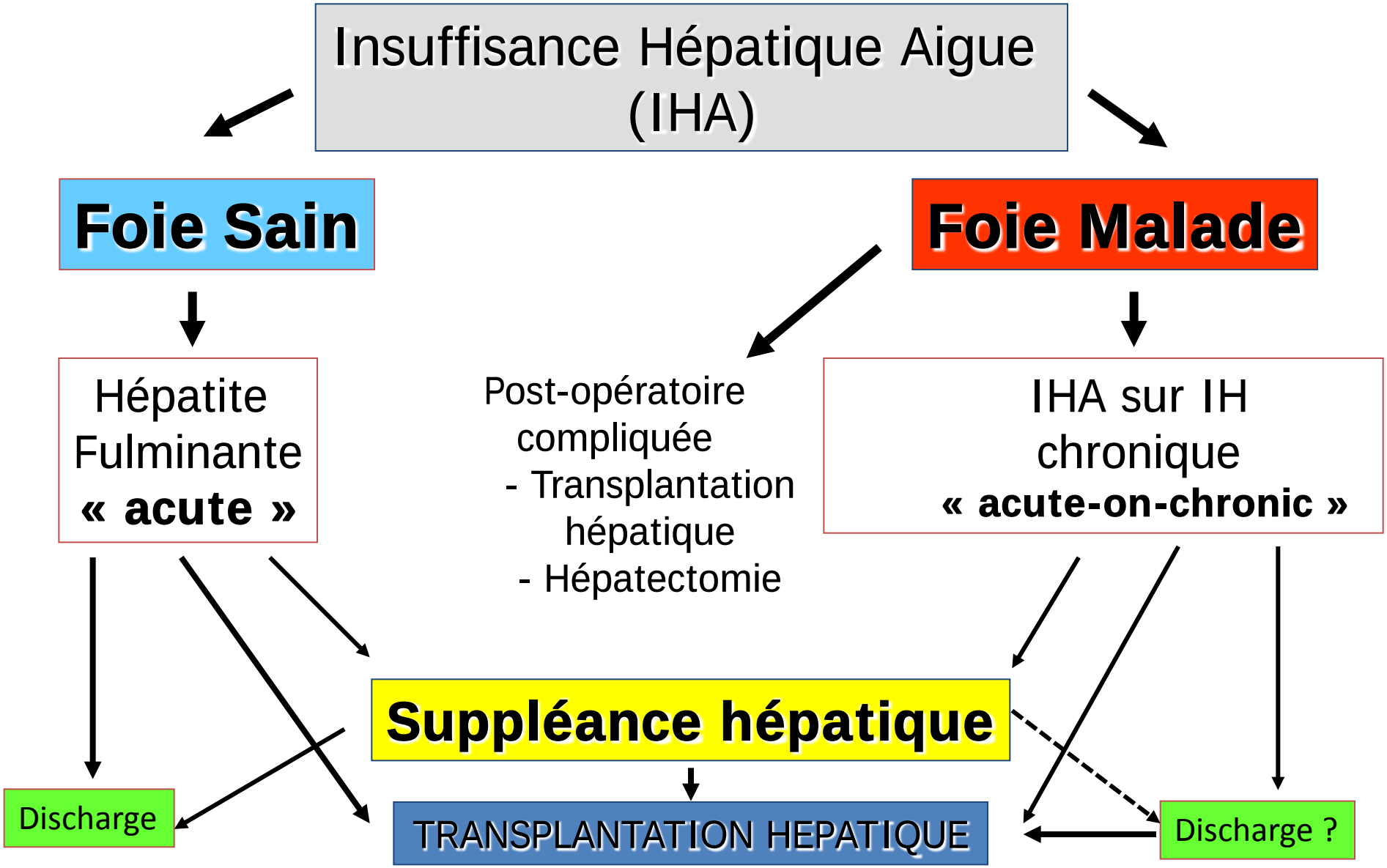
Accumulation de toxines endogènes

- → Hydrosoluble NH3
- → Liées à l'albumine
  - → Bilirubine
  - → Ac biliaire
  - → AA aromatiques
  - → BZD endogènes…
- → NO
- → Cytokines

Défaillance multiviscérales **Et** **Sepsis**

Insuffisance Hépatique



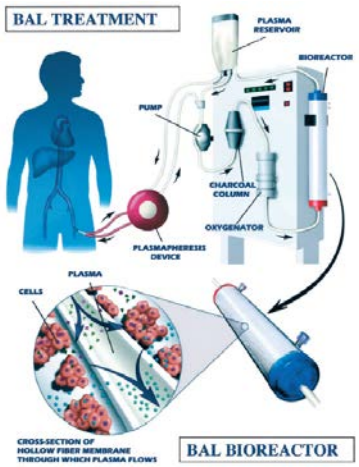

Insuffisance Hépatique Aigue (IHA)
Foie Sain
Foie Malade
Hépatite Fulminante « acute »
Post-opératoire compliquée
- Transplantation hépatique
- Hépatectomie
IHA sur IH chronique « acute-on-chronic »
Suppléance hépatique
Discharge
TRANSPLANTATION HEPATIQUE
Discharge ?

Suppléance Hépatique

Les différentes techniques

Circulation extracorporelle

Foie Bio Artificiel



ELAD system (Vital Therapies) Hépatoblastome
HepatAssist (Arbios, formerly Circe) Porc
MELS (Charite Medical Center) Porc + Humain
BLSS (Excorp Medical) Porc
AMC BAL (Amsterdam Medical Center) Porc

- Le sang (ou plasma) est séparé des hépatocytes par une membrane semiperméable
  - Imperméable pour les hépatocytes et empêchant leur rejet (pas de besoin en traitement immunosuppresseur)
  - Perméable aux nutriments, à l'albumine (pour permettre la détoxification), et aux protéines synthétisées par les hépatocytes

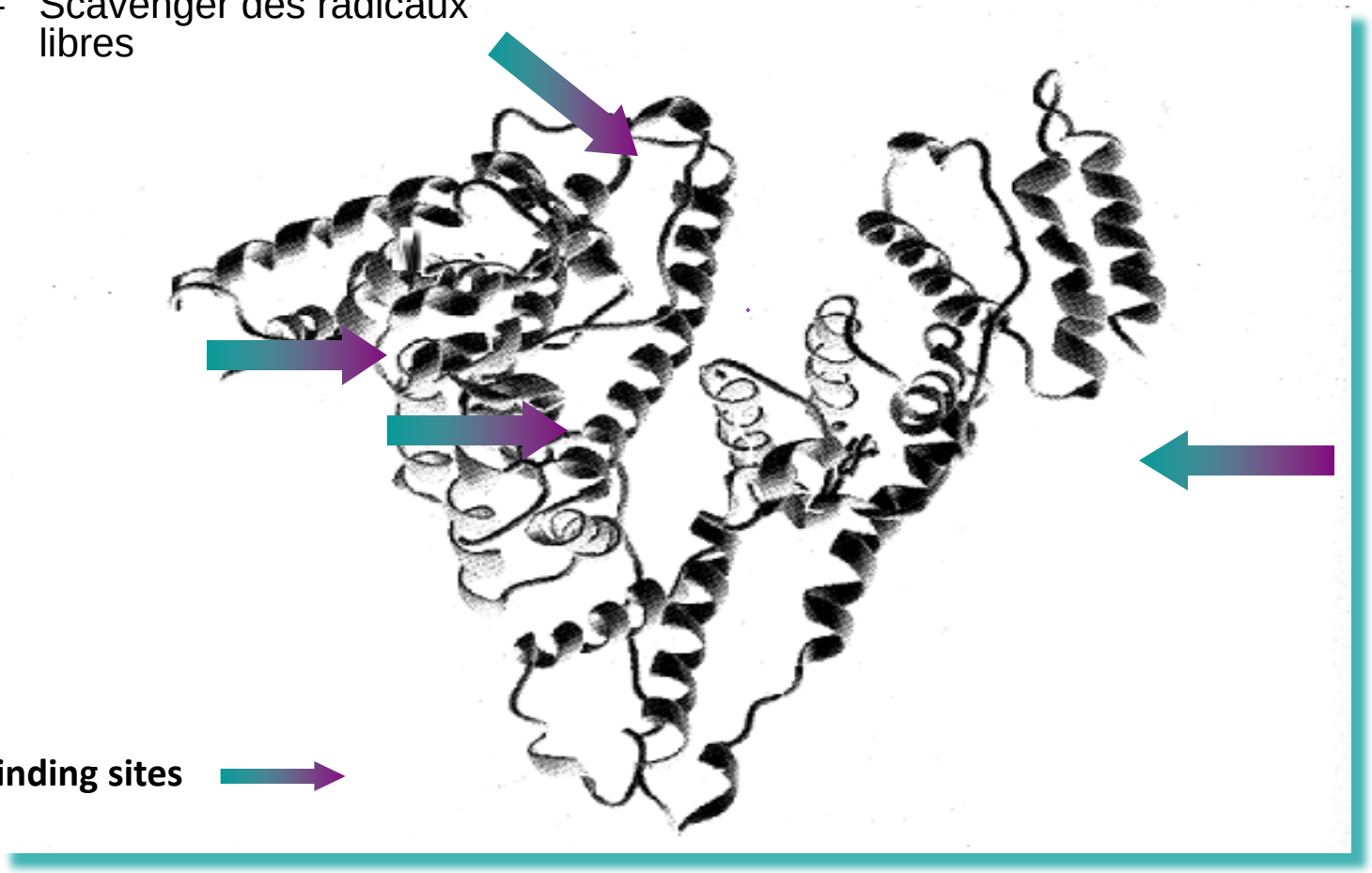
- Complexe
- Cryoconservation des hépatocytes
- Problème de biomatrice
- Cout éfevé

Pas de gain de survie

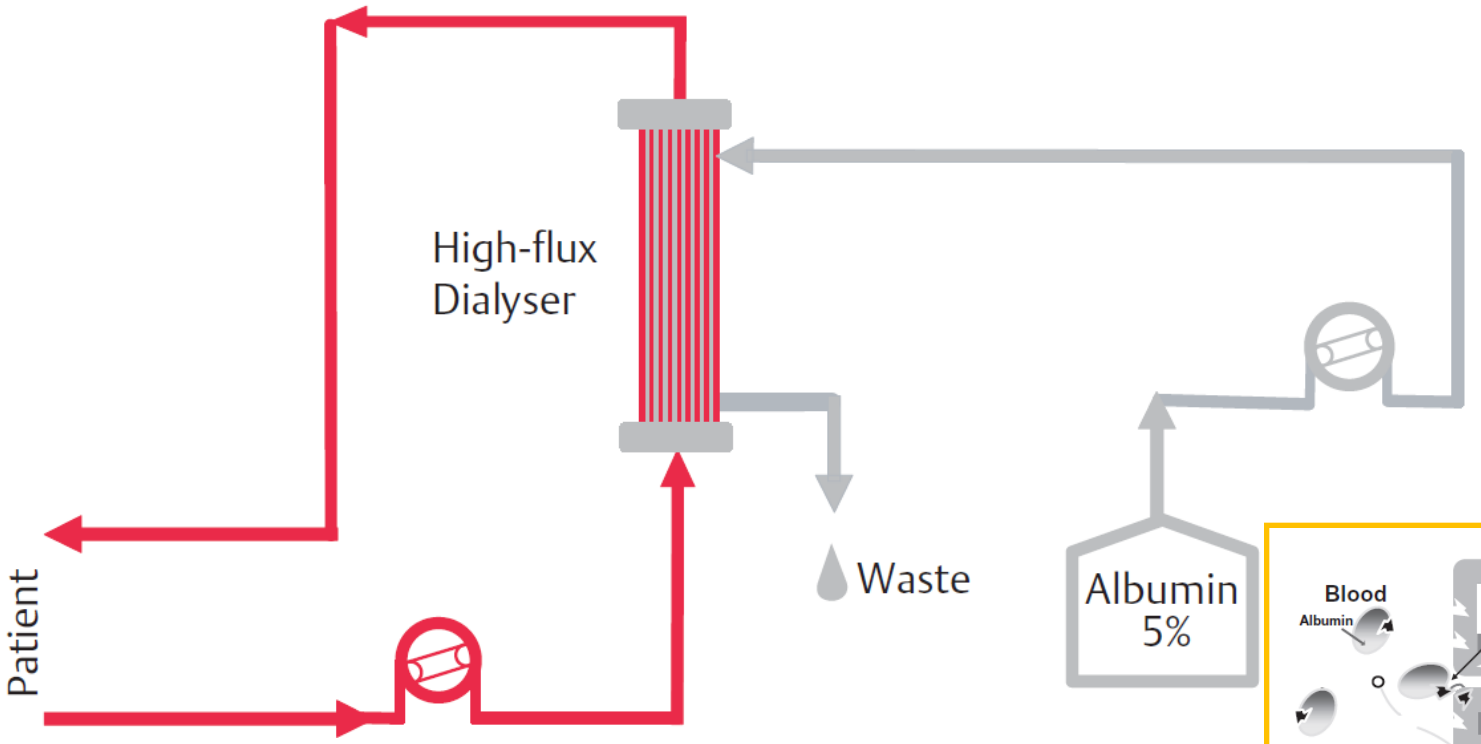
Lee WW. Hepatology 2008

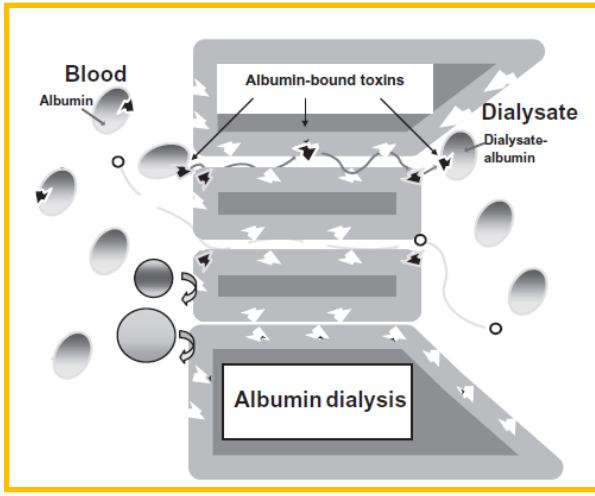
Albumine

- Protéine plasmatique la plus abondante
- 66 kDa
- fonctions :
  - Pression oncotique
  - Transporteur
  - Scavenger des radicaux libres



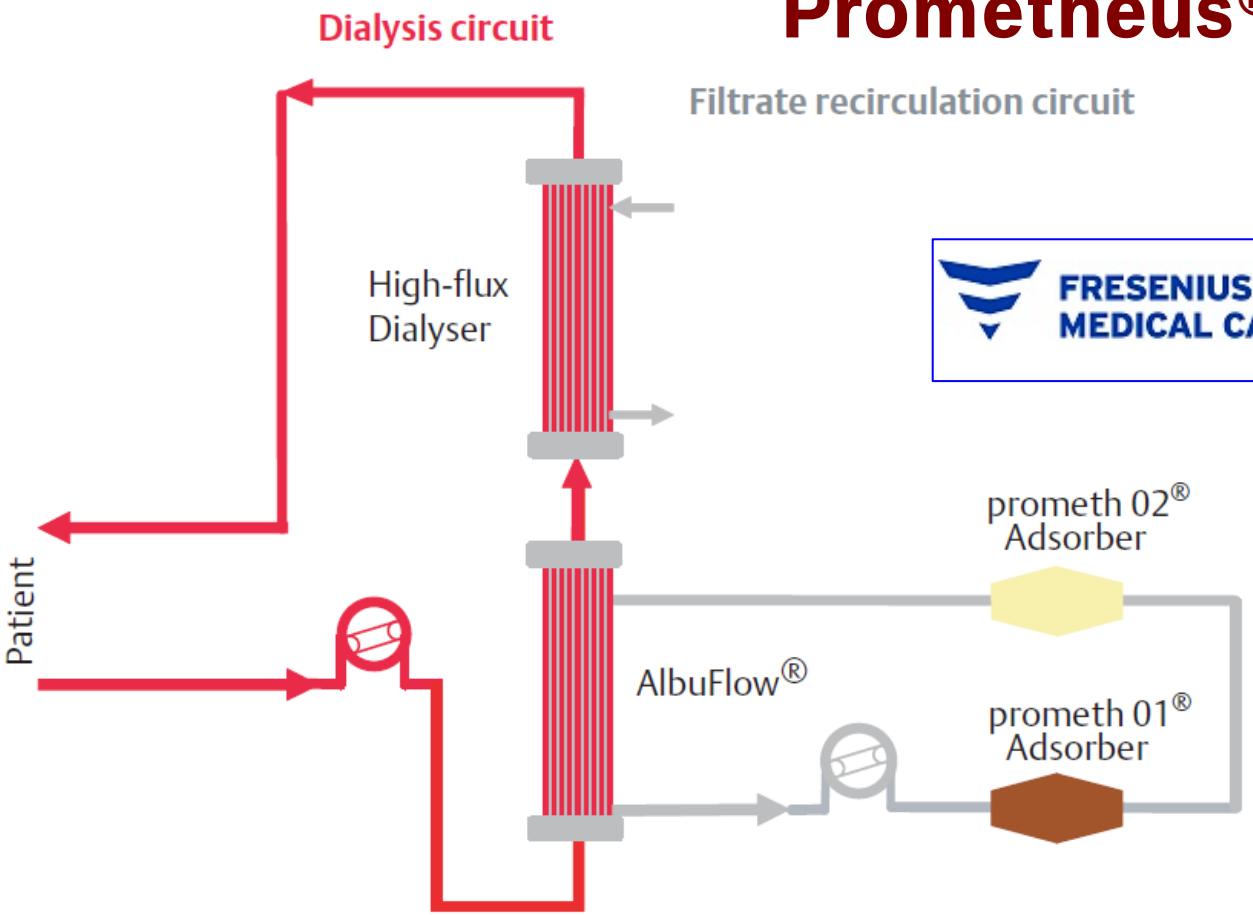
Single Pass Albumin Dialysis (SPAD)





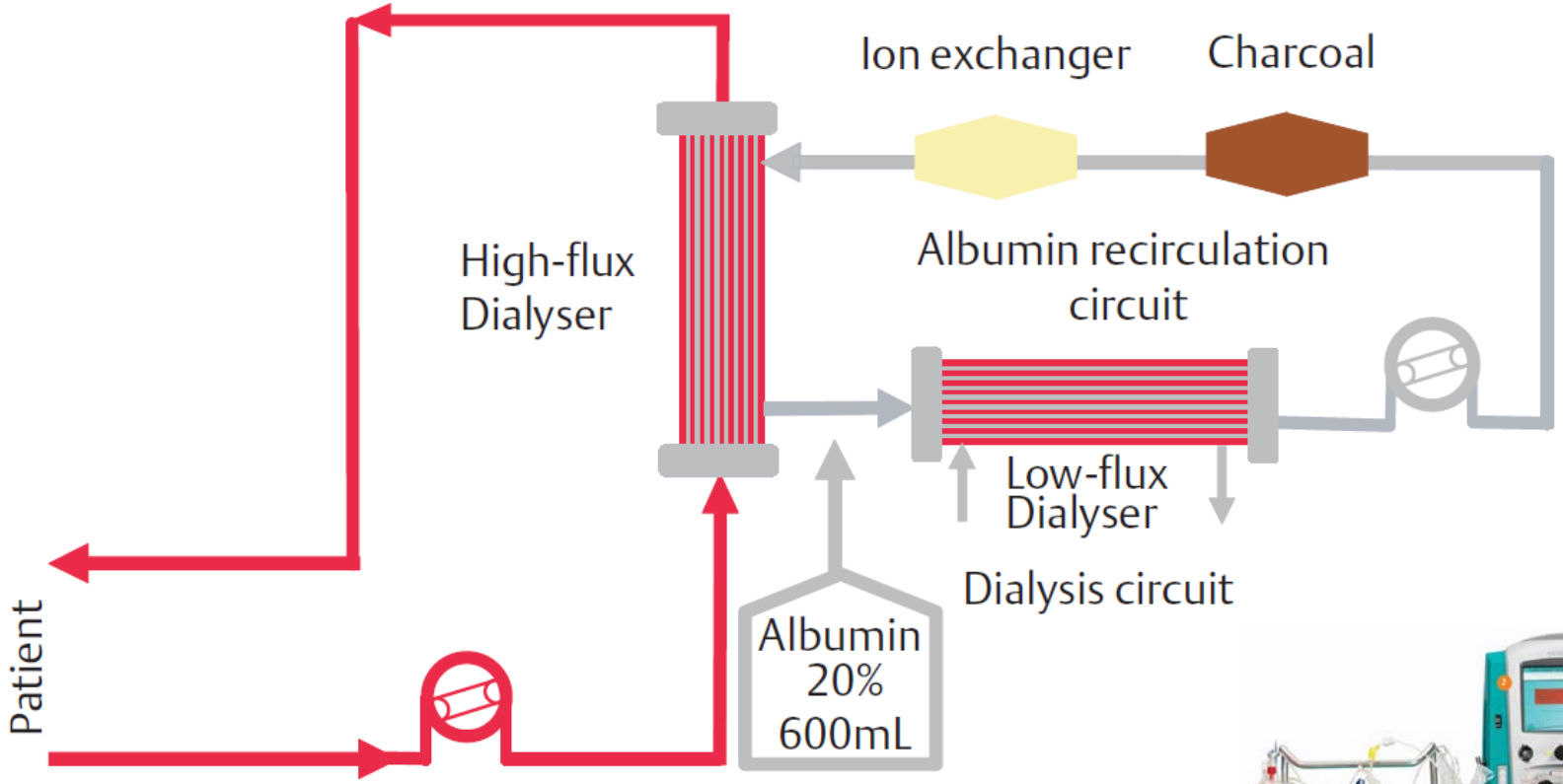
- Peu étudiée
- Relativement peu onéreuse
- Technique très proche de la CVVHD
- <u>Principes :</u> le sang dialyse contre de l'albumine (2 à 4%) qui circule à 0,7 à 2 l/h. Pas de recyclage de l'albumine

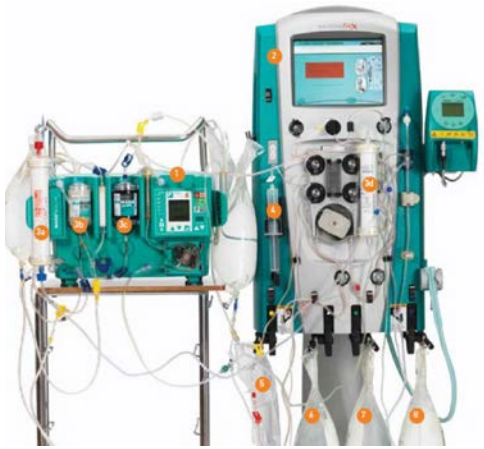
Fractionated Plasma Separation and Adsorption Prometheus®



- Décrit en 1999
- <u>Principes :</u> 1) séparation de l'albumine du patient par une membrane(Albuflow, 300 kDa) qui est ensuite détoxifiée sur deux colonnes avant d'être réinjecté au patient, et 2) dialyse (haut flux)

Molecular Adsorbent Recirculating System (MARS®)

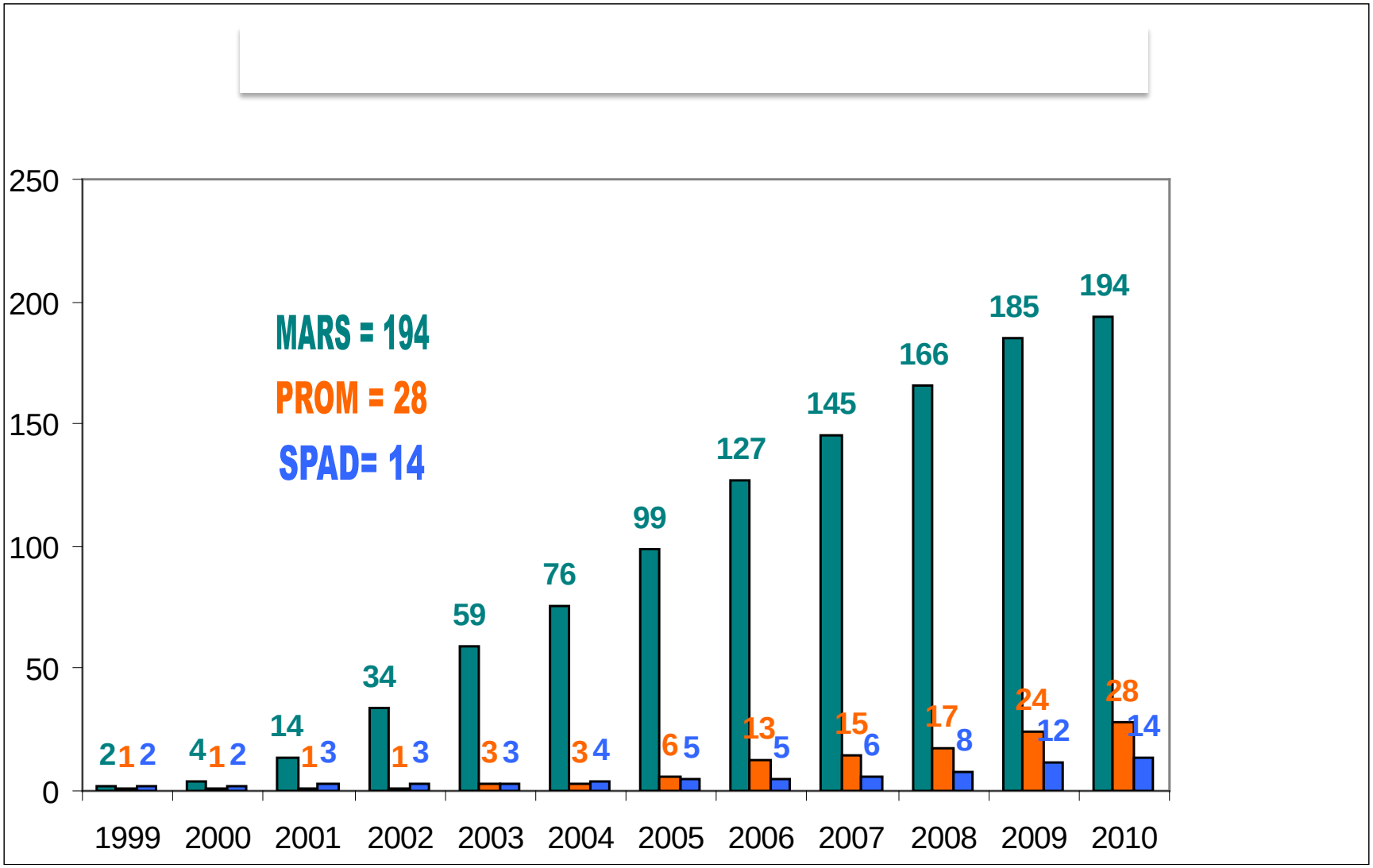




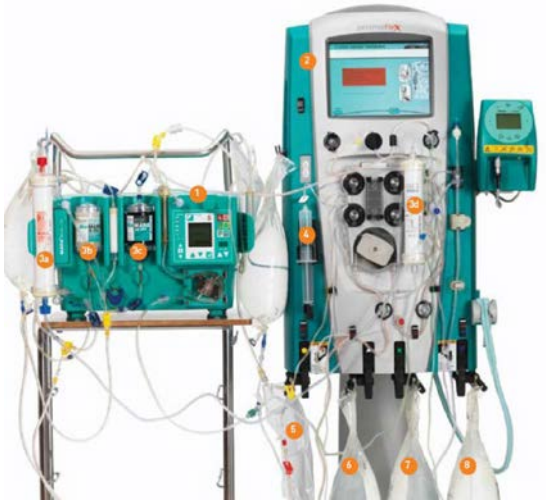
Baxter Acquires Gambro to Enhance Renal Therapy Portfolio

Tuesday, December 04, 2012 (0 Comments)

Share |

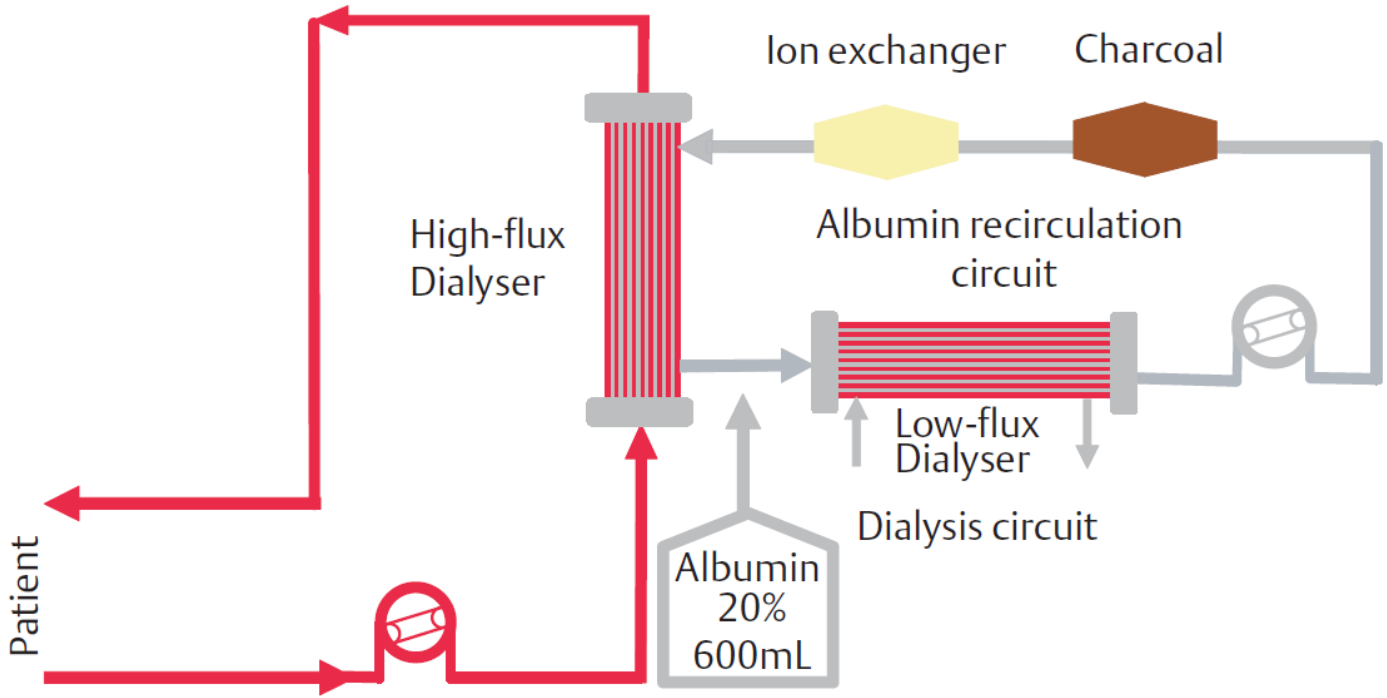

250
200
150
100
50
0
MARS = 194
PROM = 28
SPAD= 14
2 1 2
4 1 2
14 1 3
34 1 3
59 3 3
76 3 4
99 6 5
127 13 5
145 15 6
166 17 8
185 24 12
194 28 14
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010

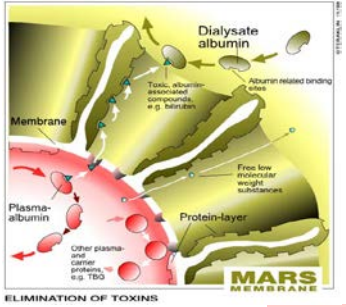
Système MARS ®



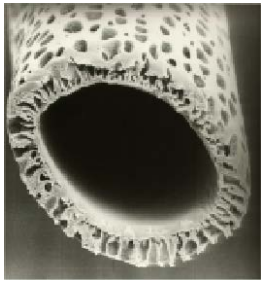
Molecular Adsorbent Recirculating System (MARS®)

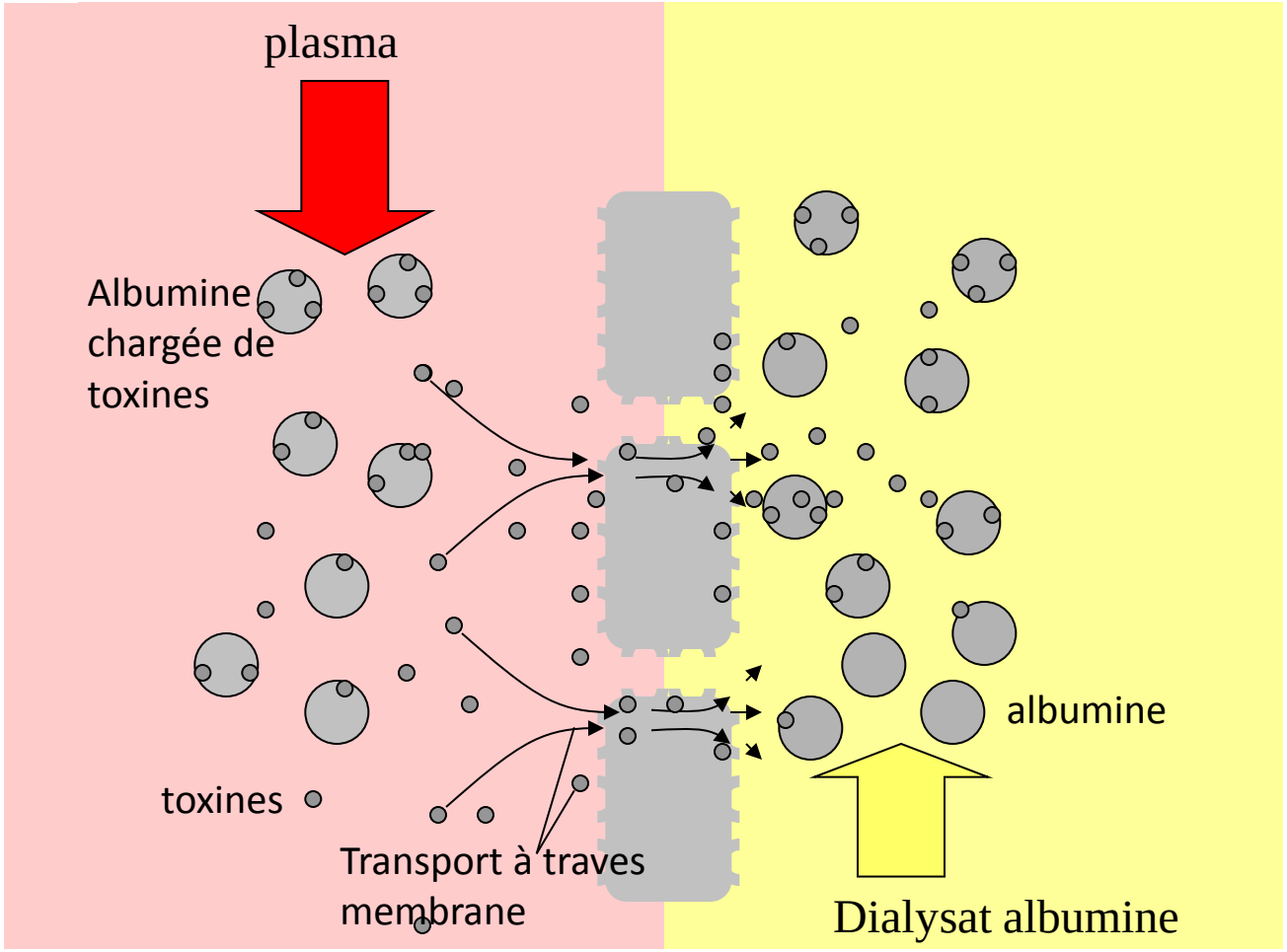
- Depuis 1993 (Stange J. Mitzner S. Artif Organs. 1993)
- Système le plus utilisé (et étudié)
- Principes : sang dialysé au travers d'une membrane imperméable à l'albumine contre une solution d'albumine 20%, elle-même détoxifiée en passant par des colonnes de charbon et échangeuses d'ions, et par dialyse





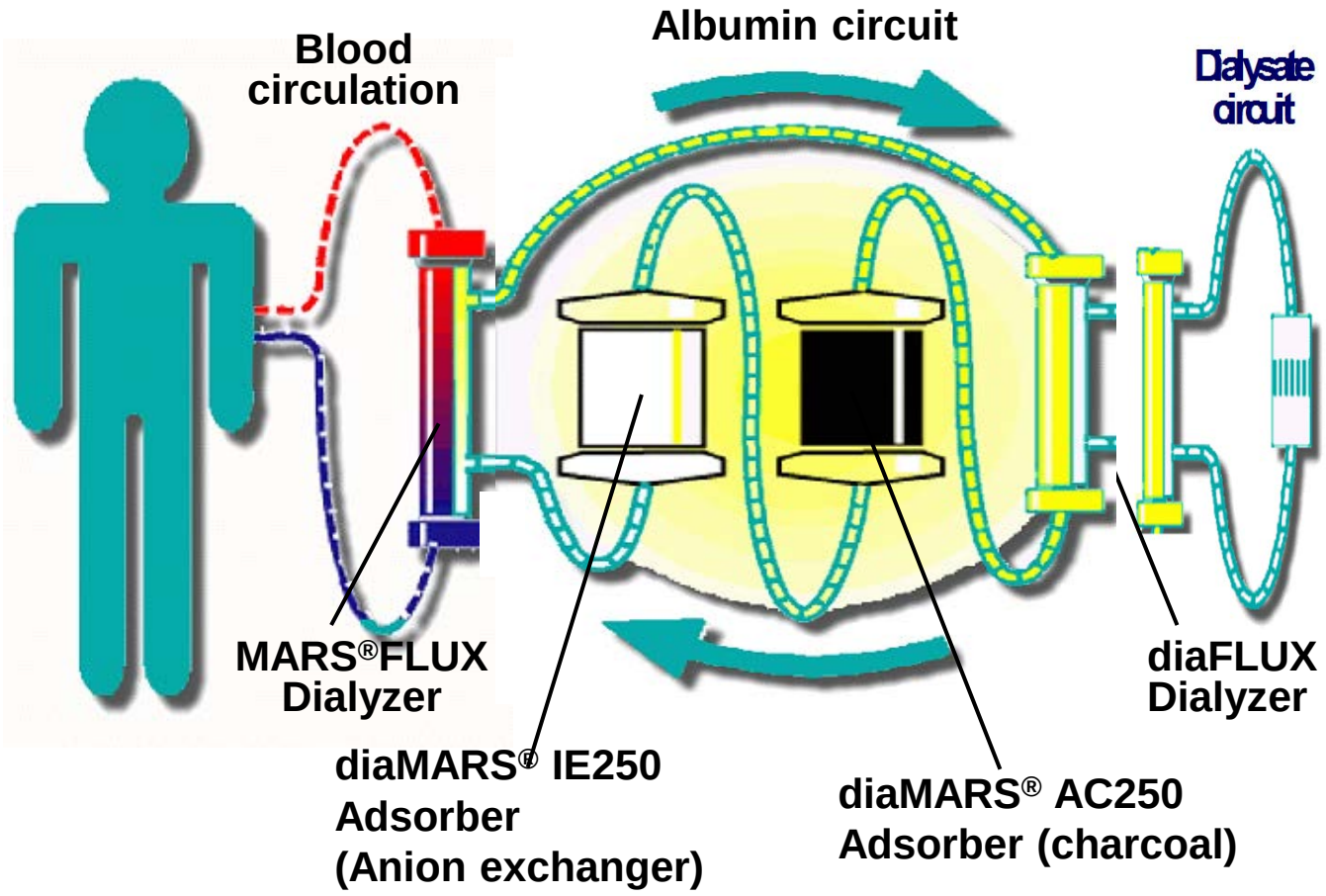
MARS® Flux

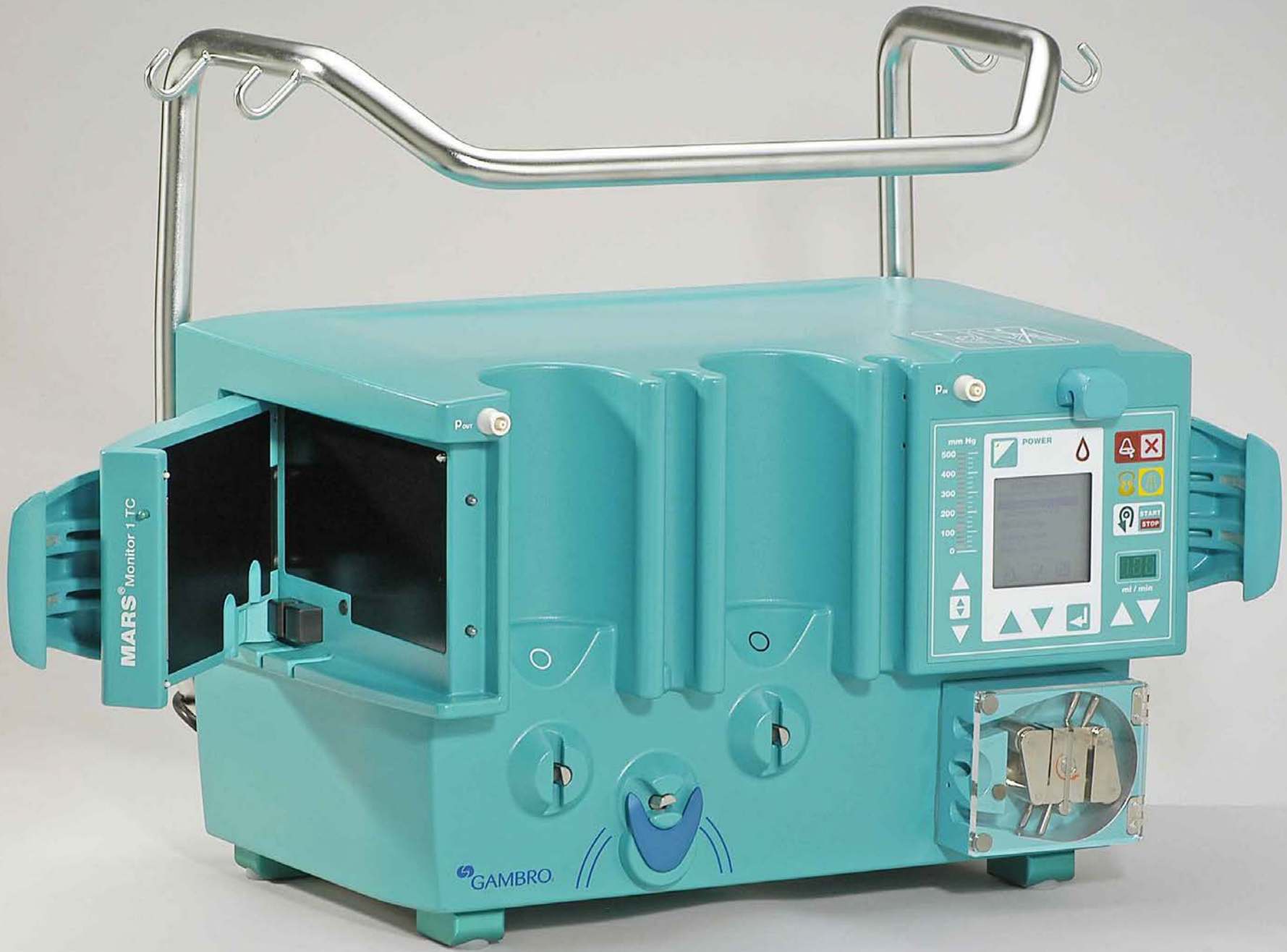




Stange J, Mitzner S. Int J Artif Organs. 1996 Nov;19(11):677-91

Système MARS ®

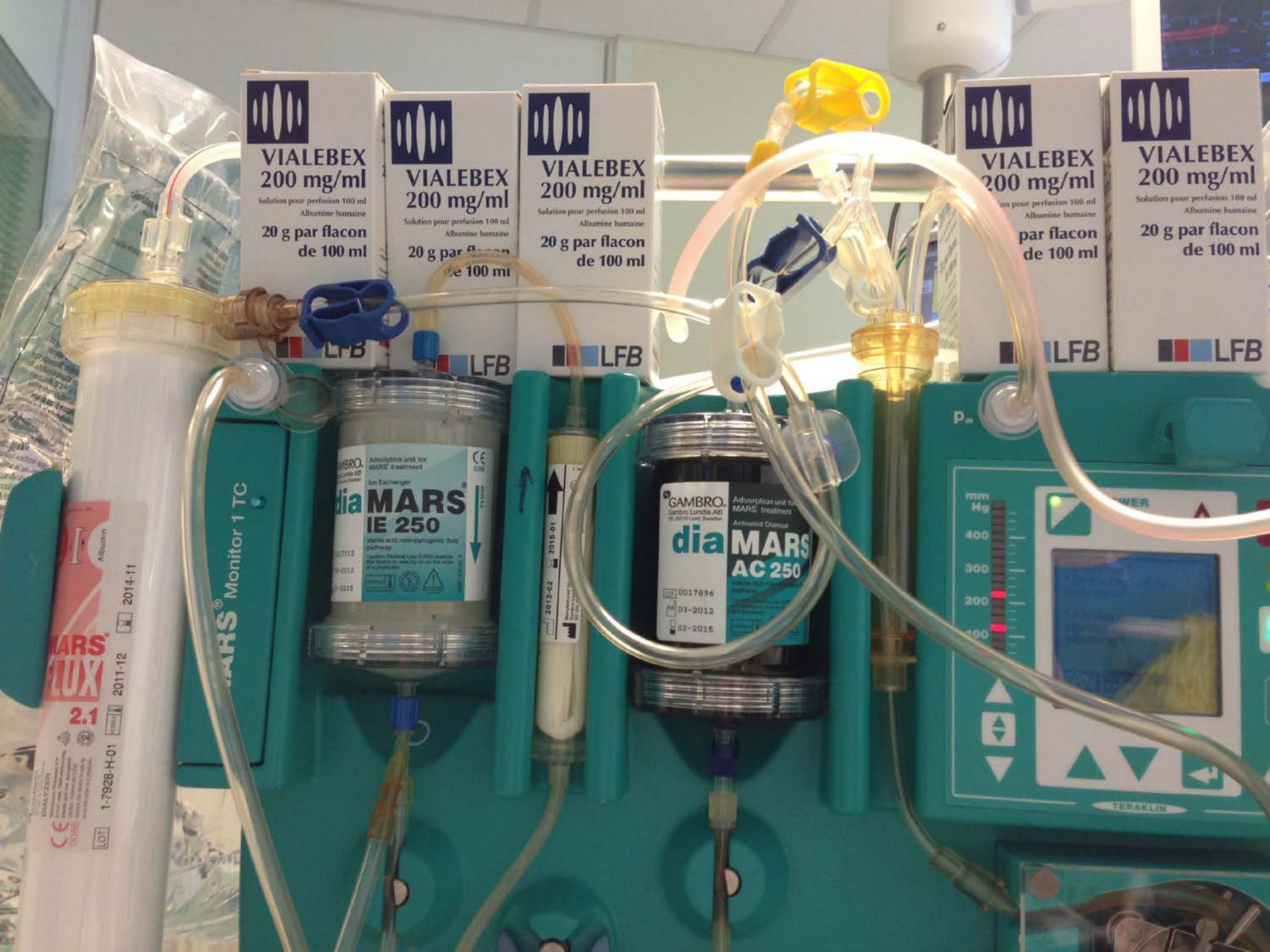


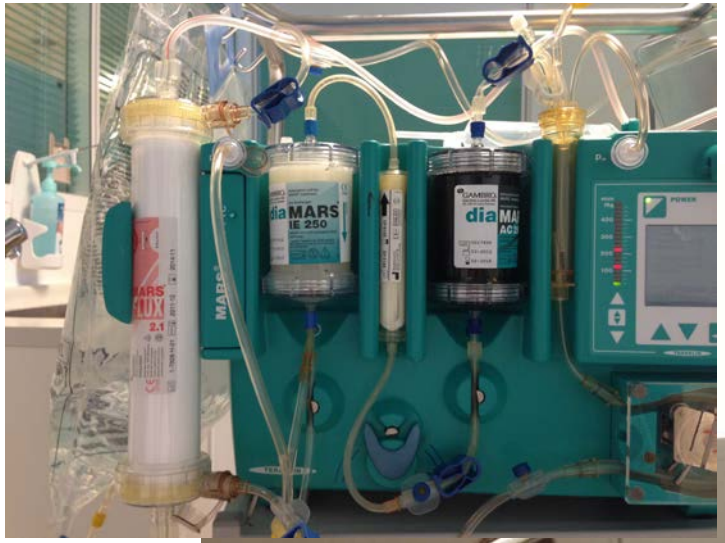

MARS® Monitor 1 TC
POWER
mm Hg
500
400
300
200
100
0
START
STOP
ml / min
GAMBRO


MARS
FLUX
2.1
DIALYZER
2006-05
6-7923-H-01


dia
MARS
IE 250
dia
MARS
AC 250

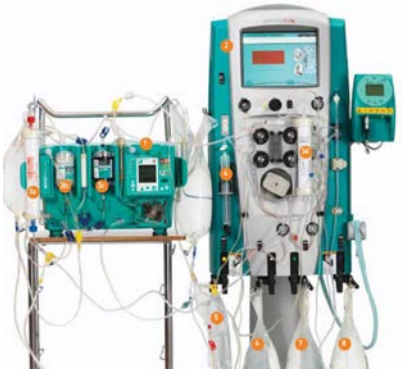

dia
FLUX
1.8
LOW FLUX DIALYZER
2006-05
6-7903-H-01


VIALEBEX
200 mg/ml
Solution pour perfusion 100 ml
Albumine humaine
20 g par flacon
de 100 ml
LFB
dia MARS IE 250
dia MARS AC 250
GAMBRO
Monitor 1 TC
TERAKLIN


diaMARS
IE 250
dia

prismaflex
Situation
MARS
200
50

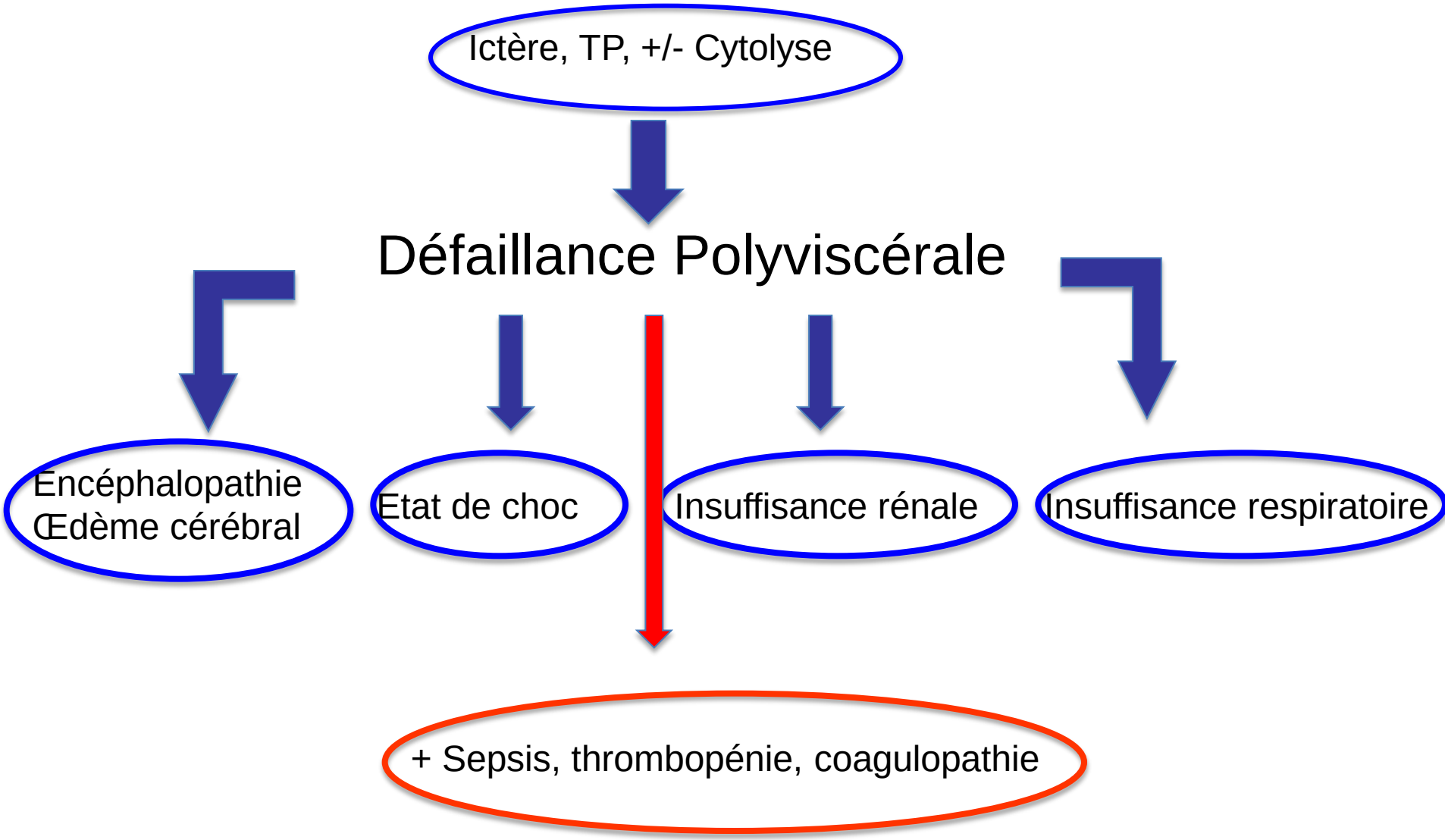
Système MARS ®



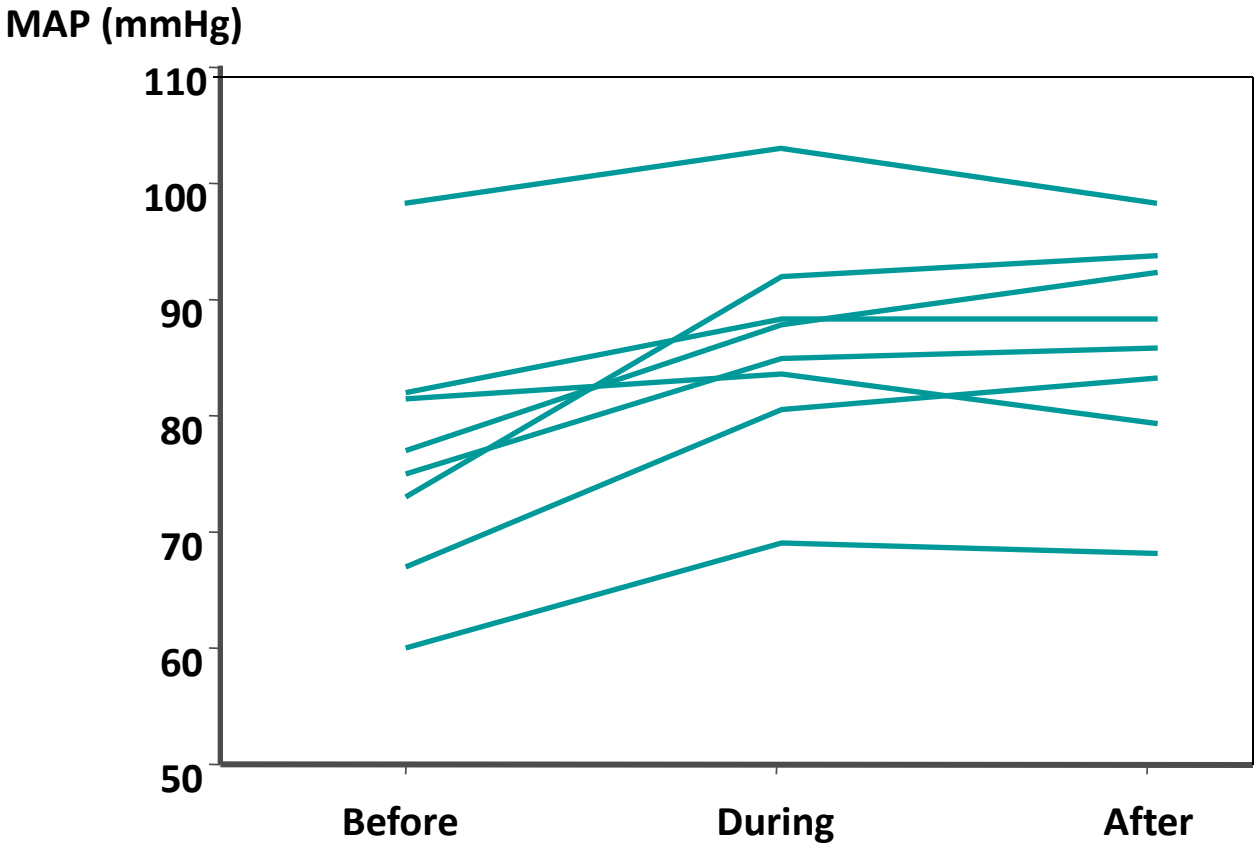
Molécules hydrosolubles	Molécules liées à l'albumine plasmatique
Créatinine	Bilirubine
Urée	Acides biliaires
Ammoniac	Tryptophane
Lactate	Acides gras à chaîne moyenne et à chaîne légère
IL-6, Tumor Necrosis Factor	Acides aminés aromatiques
	Mercaptans
	Substances vasoactives
	Cytokines
	Benzodiazépines endogènes
	Monoxyde d'azote

Système Mars ®
Et
défaillance d’organes

Insuffisance Hépatique



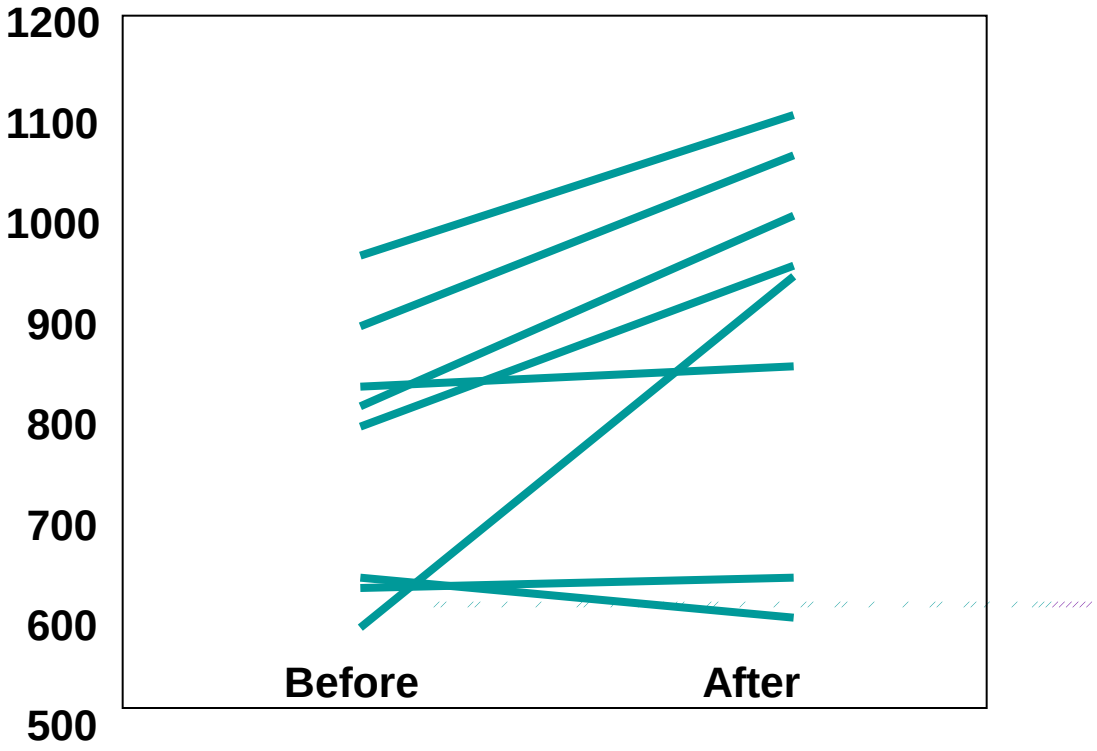
Impact du MARS® sur l'hemodynamique



Sorkine et al. Crit Care Med 2001

Impact du MARS® sur l'hemodynamique

Augmentation des RVSI de 757 (580-948) à 884 (595-1086) dyn s/cm^3/m^2;p<0,05

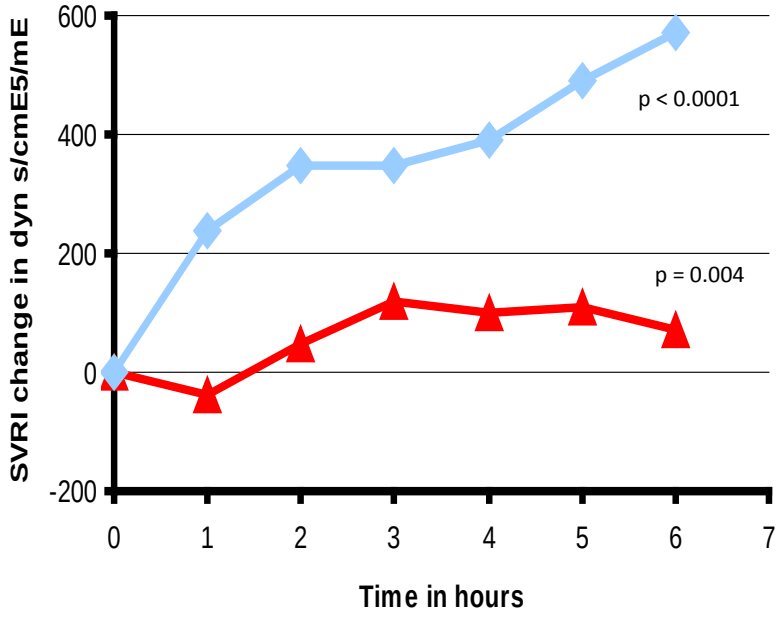


Schmidt et al. Liver Transpl 2001

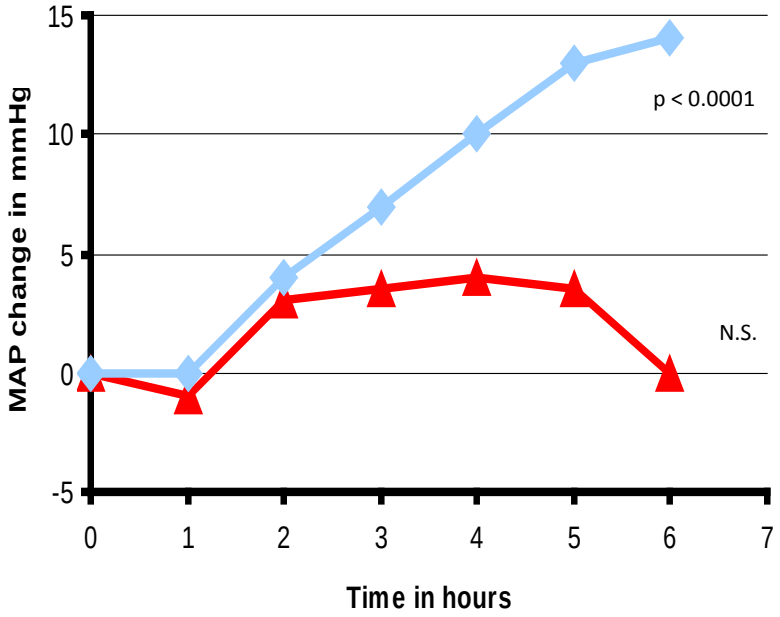
Impact du MARS® sur l'hemodynamique

MARS Dans l'IHA

RVSI



PAM



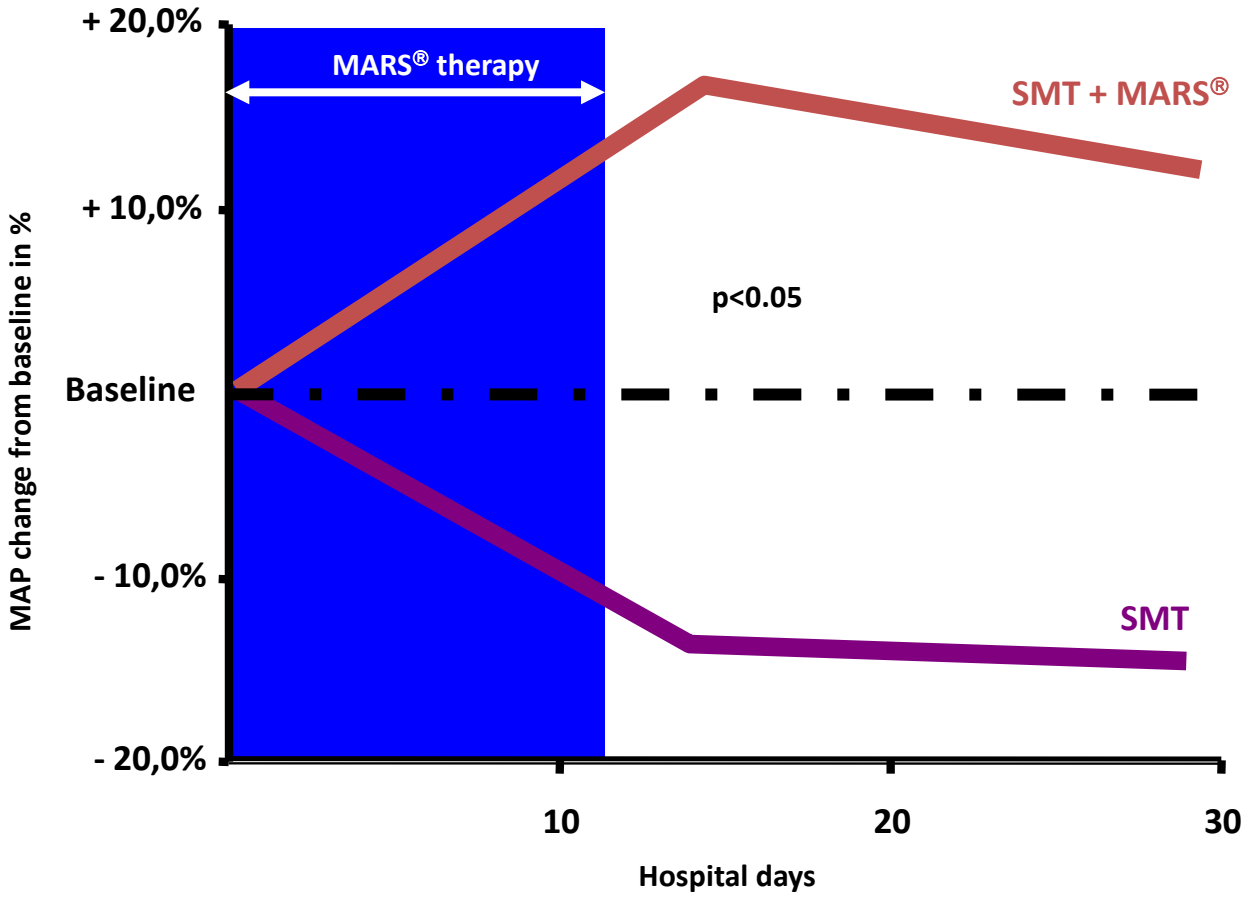
Hypothermia

MARS

Schmidt et al., Liver Transplantation 2003;9:290-297

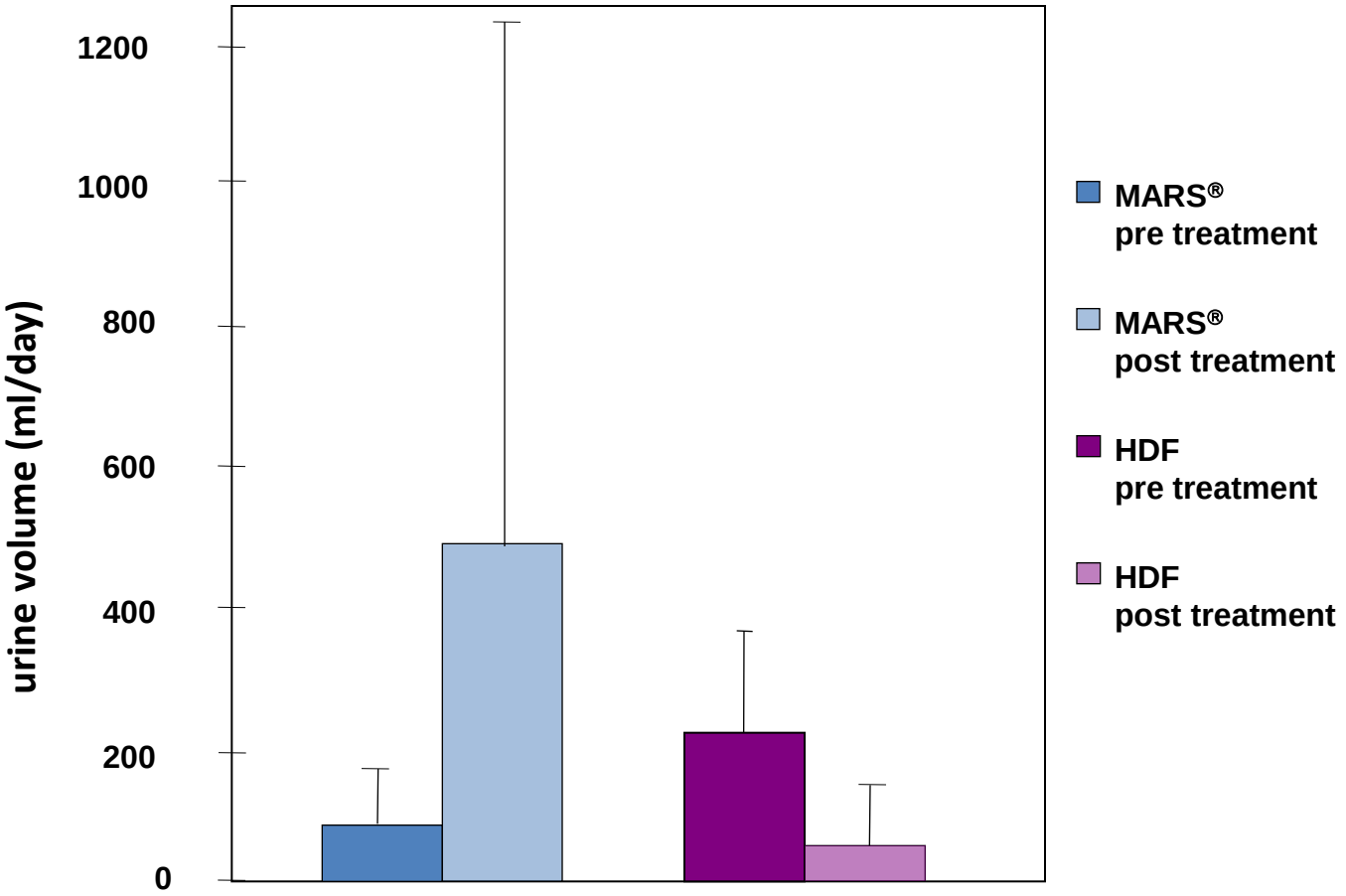
Impact du MARS® sur l'hemodynamique

Randomisée , 3 centres , 23 patients



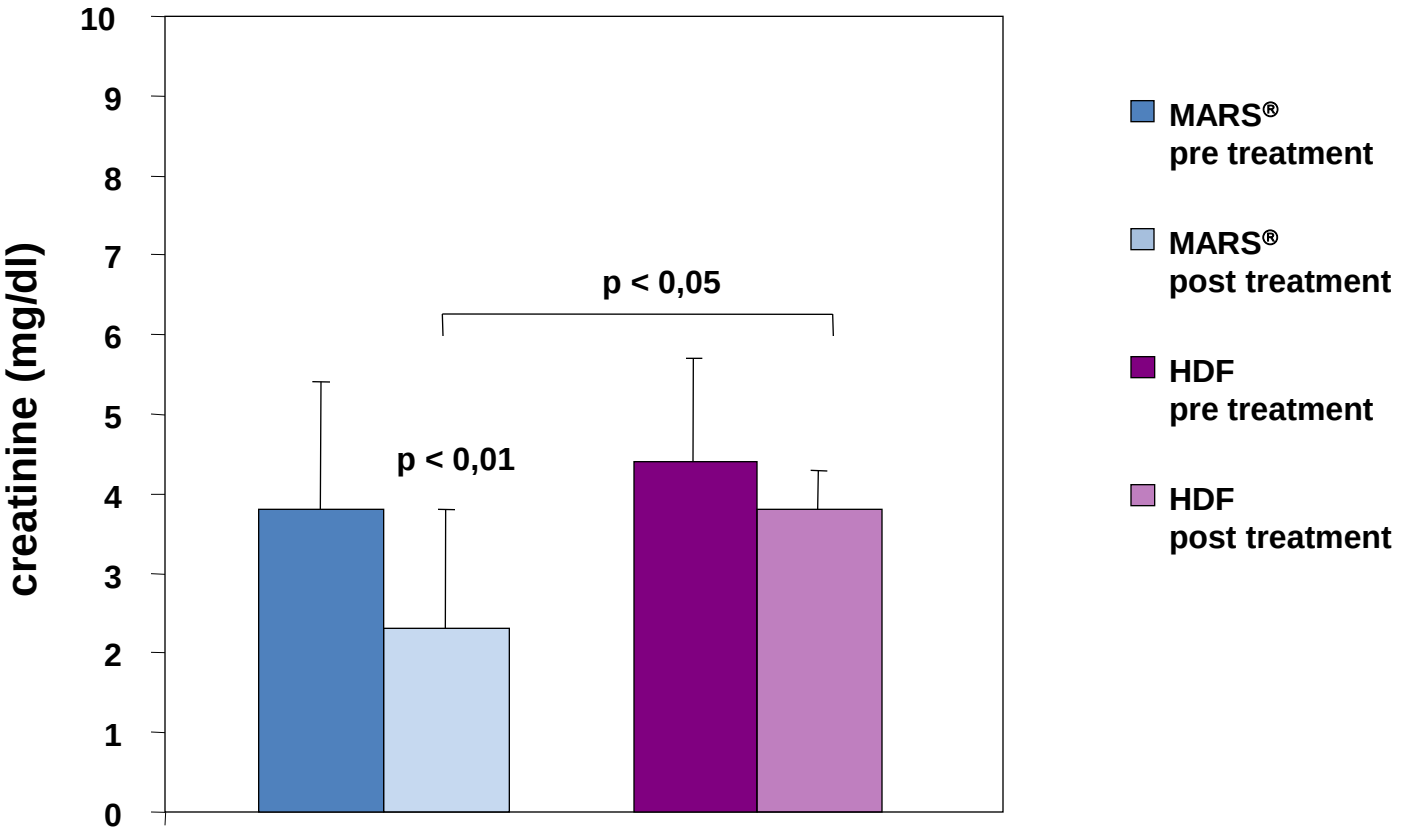
Heemann et al., Hepatology 2002;36:949-958

Impact du MARS® sur la fonction rénale



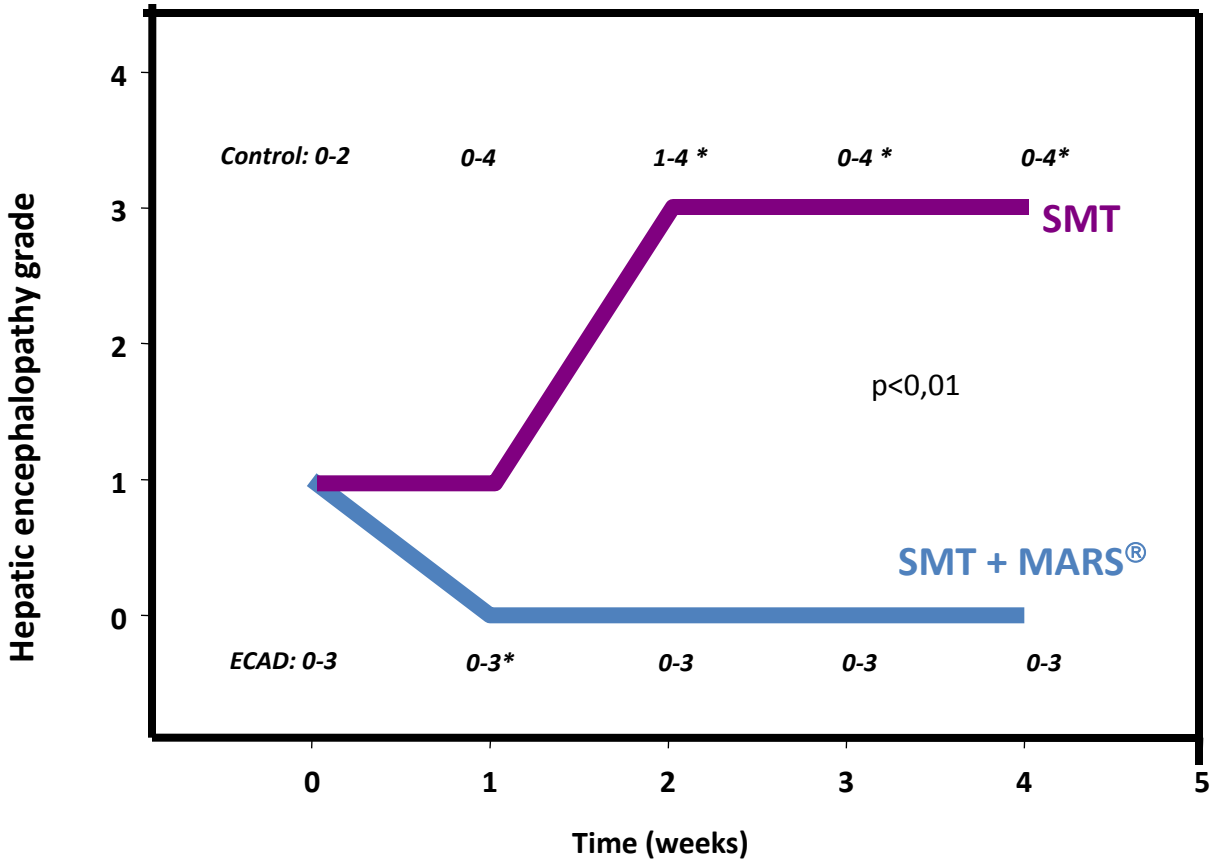
Mitzner et al. Liver Transpl 2000 6(3); 277-86

Impact du MARS® sur la fonction rénale



Mitzner et al. Liver Transpl 2000 6(3); 277-86

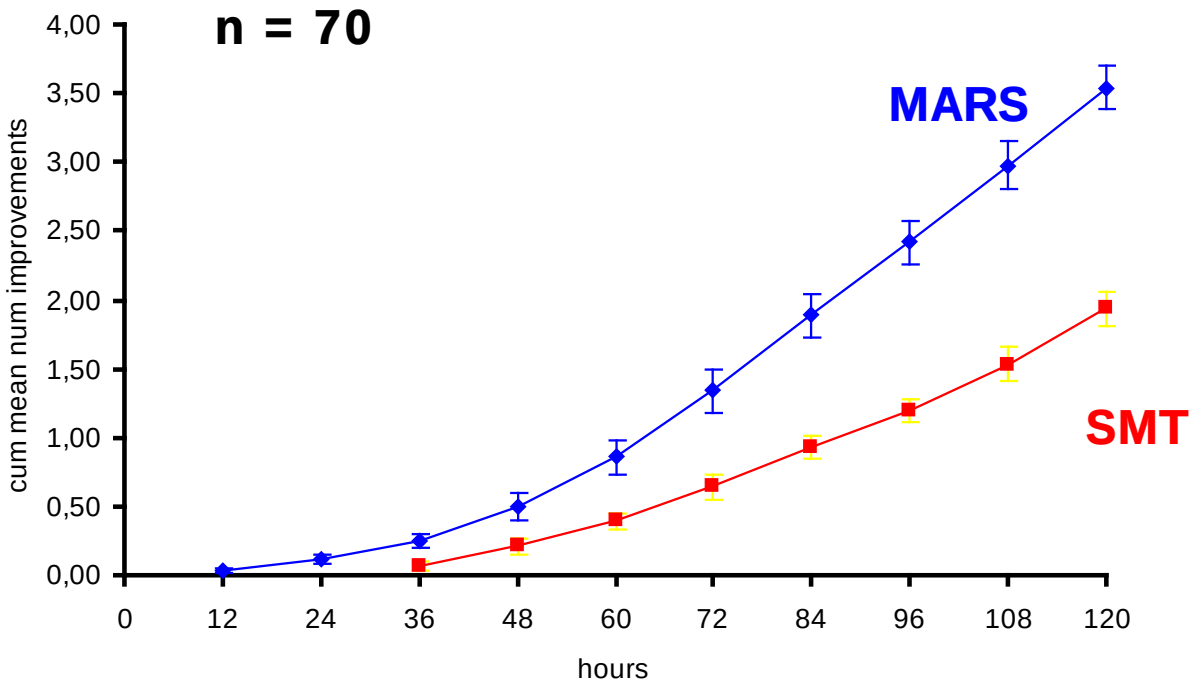
Impact du MARS® sur l'encéphalopathie hépatique



Heemann et al. Hepatology 2002;36

Impact du MARS® sur l'encéphalopathie hépatique

70 patients Grade 3 or 4
Mars 39 patients. 62% repondeurs vs 40%.
Amélioration de 2 grades.



Hassanein T et al. Hepatology 2007

Impact du MARS®

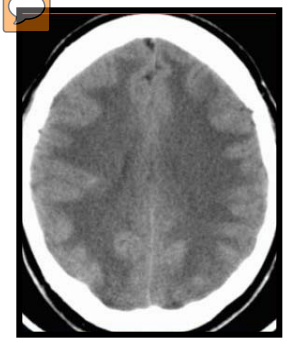
Paramètres biologiques

70 patients Grade 3 or 4
Mars 39 patients. 62% repondeurs vs 40%.
Amélioration de 2 grades.

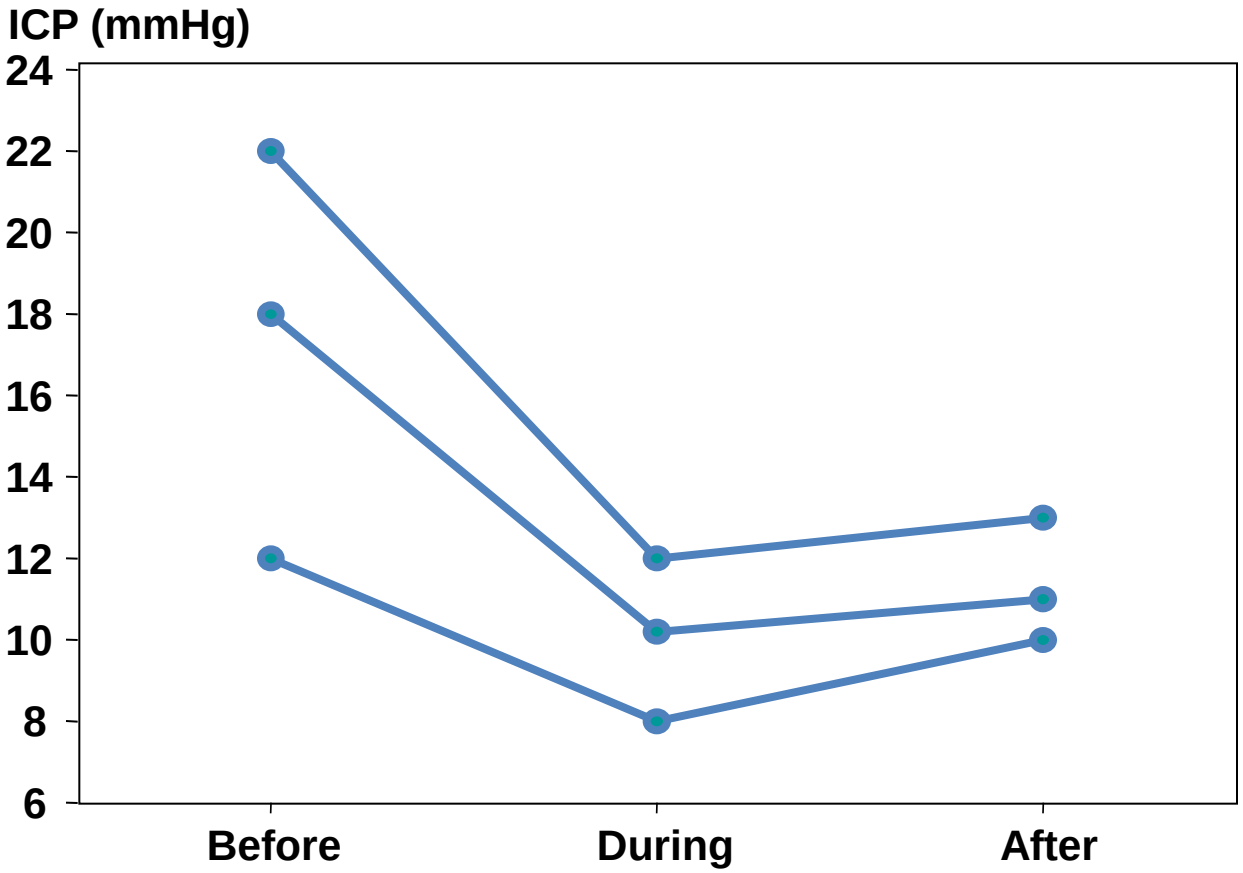
	SMT				ECAD			
Test	Baseline	EOS	*P*	% Change	Baseline	EOS	*P*	% Change
Creatinine mg/dL	1.7 (0.6-5)	1.4 (0.4-5.7)	0.096	−13 (−77 - 67)	1.7 (0.4-5.6)	1.4 (0.4-4.5)	0.001	−18 (−68 - 133)
BUN mg/dL	42.5 (2-136)	48 (3-147)	0.927	−1 (−68 - 229)	40 (6-171)	20 (4-84)	0.0001	−38 (−88-217)
Bilirubin mg/dL	12.2 (2.3-58.9)	12.8 (3-57.4)	0.134	10 (−79-91)	15.8 (1.8-54.5)	16.1 (3-38.5)	0.064	−7 (−60-352)
Bile acids μmol/L	65.4 (12.2-247.1)	54.5 (2-230)	0.008	−30 (−85-9)	65.2 (38.1-249)	61 (11-207)	0.003	−35 (−79-51)
BCAA/AAA [1]	1.175 (0.62-2.49)	1.04 (0.35-5.5)	0.208	10 (52-378)	0.96 (0.49-2.98)	1.44 (0.57-3.37)	0.031	26 (−30-271)
Ammonia μmol/L	90.5 (34-786)	63 (32-308)	0.307	−24 (−74-106)	104 (43-449)	60.5 (22-182)	0.001	−35 (−84-30)

Abbreviation: EOS, end of study.

Hassanein T et al. Hepatology 2007



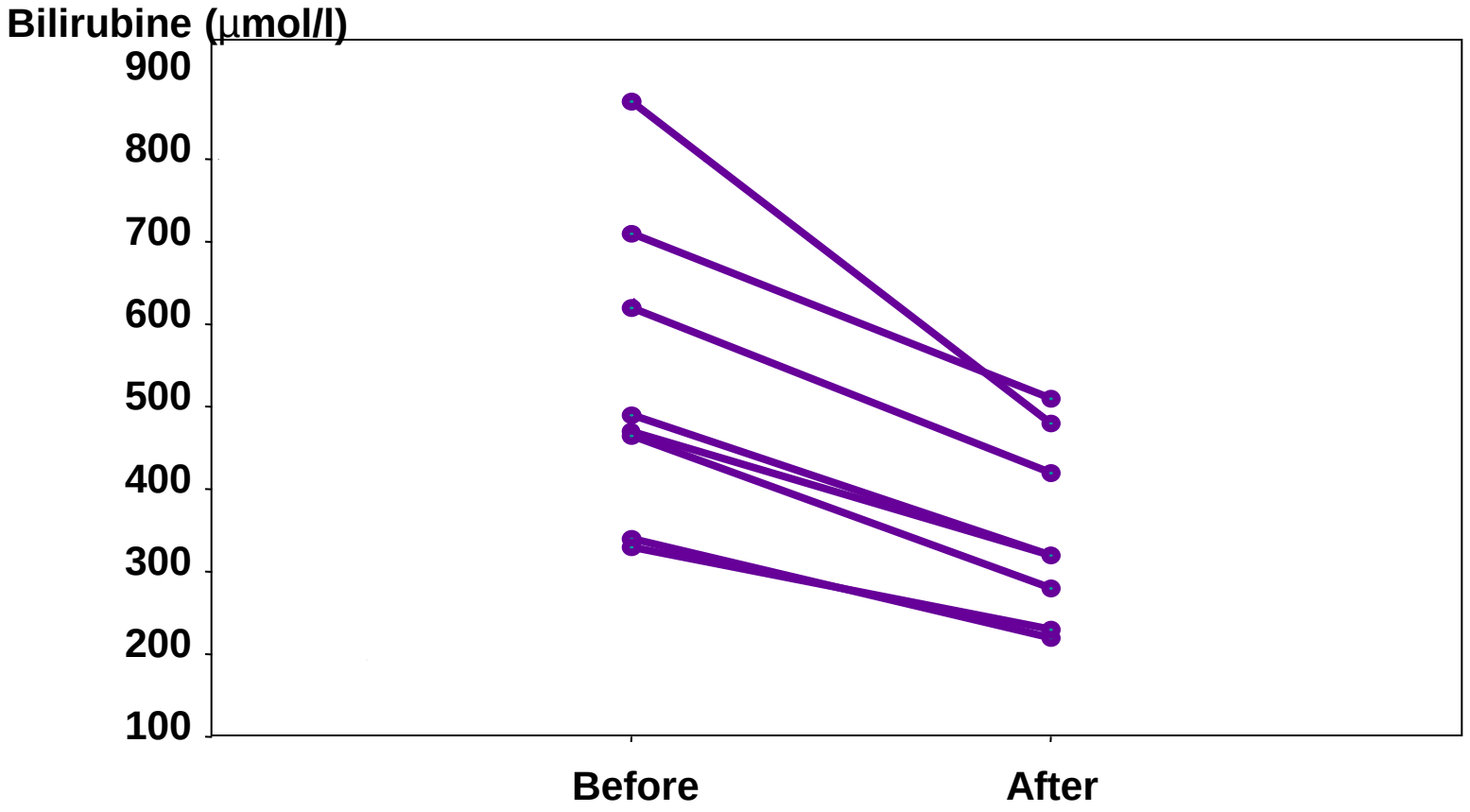
Impact du MARS® sur la PIC



Sorkine et al. Crit Care Med 2001

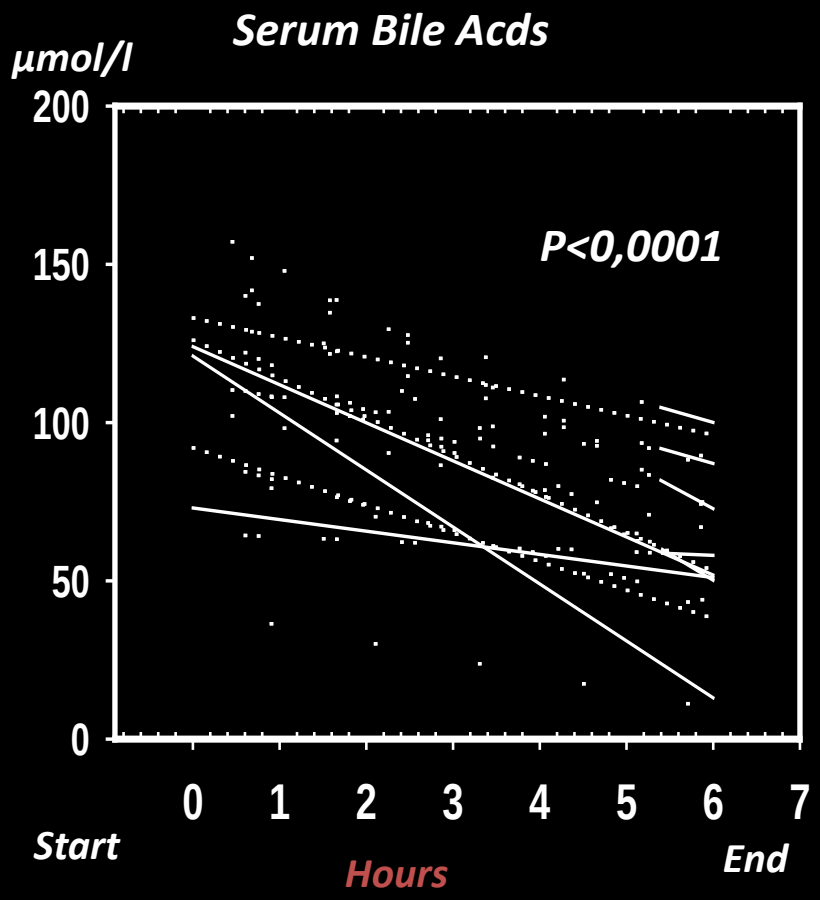
Epuration de la bilirubine

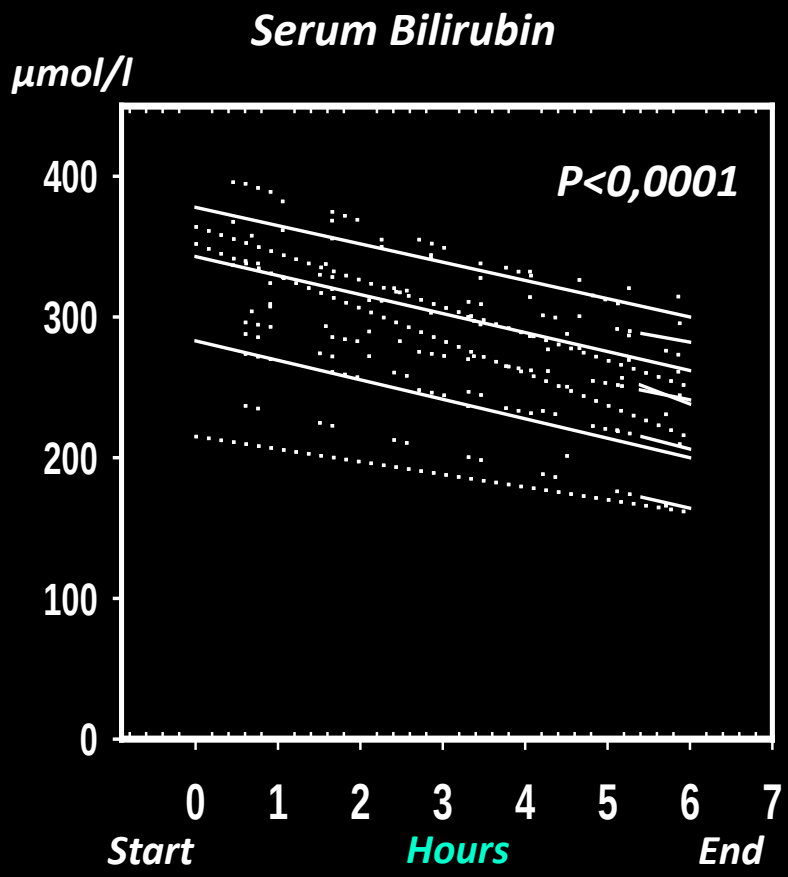
Baisse de la bilirubine de 537 (324-877) à 351 (228-512) µmol/l; p<0,05



Schmidt et al. Liver Transpl 2001: 7(8): 709-12

Epuration de la bilirubine et acides biliaires





Liver Transplantation, 2000: 603-613

Le MARS® est indiqué dans deux situations

Dans l'attente d'une transplantation
ou
une éventuelle récupération

Hépatite fulminante

Décompensation aigue de La Cirrhose

Artificial and bioartificial support systems for liver failure (Review)

Liu JP, Gluud LL, Als-Nielsen B, Gluud C

Avant 2002

483 patients
insuffisance hépatique
Mars, Hepatassist…

This is a reprint of a Cochrane review, prepared and maintained by The Cochrane Collaboration and published in *The Cochrane Library* 2007, Issue 4

http://www.thecochranelibrary.com

THE COCHRANE COLLABORATION®

Artificial and bioartificial support systems for liver failure (Review)

Liu JP, Gluud LL, Als-Nielsen B, Gluud C

2002

Comparison 1. Support systems versus standard medical therapy

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Mortality	12	483	Risk Ratio (M-H, Random, 95% CI)	0.86 [0.65, 1.14]
2 Bridging to transplantation	4	65	Risk Ratio (M-H, Random, 95% CI)	0.87 [0.70, 1.09]
3 Hepatic encephalopathy	8	233	Risk Ratio (M-H, Random, 95% CI)	0.68 [0.53, 0.88]
4 Adverse events	6	149	Risk Ratio (M-H, Random, 95% CI)	2.38 [0.76, 7.47]
4.1 Bleeding	6	101	Risk Ratio (M-H, Random, 95% CI)	1.74 [0.34, 8.99]
4.2 Infection	1	24	Risk Ratio (M-H, Random, 95% CI)	3.00 [0.13, 67.06]
4.3 Coagulopathy	1	24	Risk Ratio (M-H, Random, 95% CI)	4.0 [0.52, 30.76]

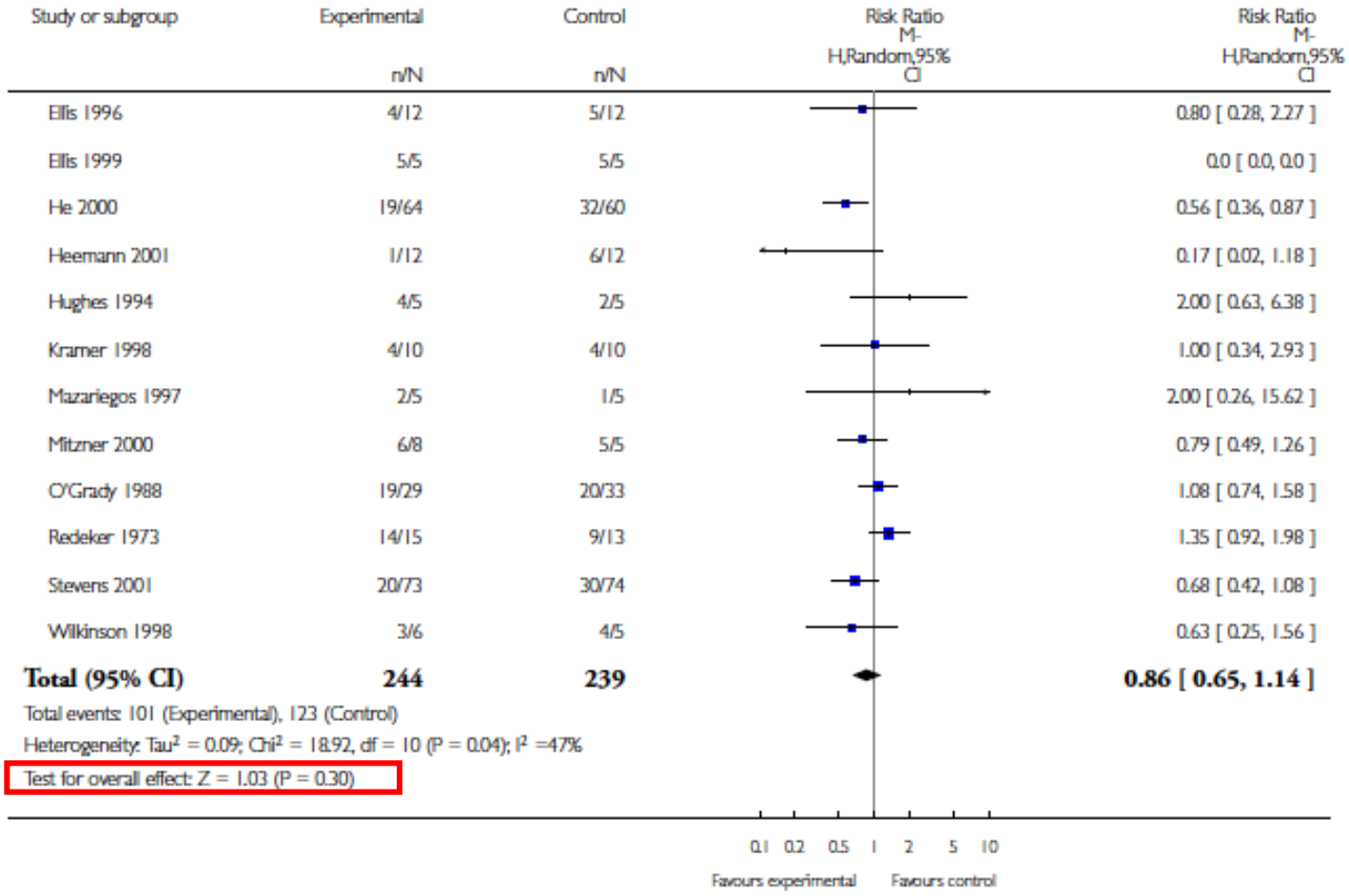
THE COCHRANE COLLABORATION®

Analysis 1.1. Comparison 1 Support systems versus standard medical therapy, Outcome 1 Mortality.

Review: Artificial and bioartificial support systems for liver failure

Comparison: 1 Support systems versus standard medical therapy

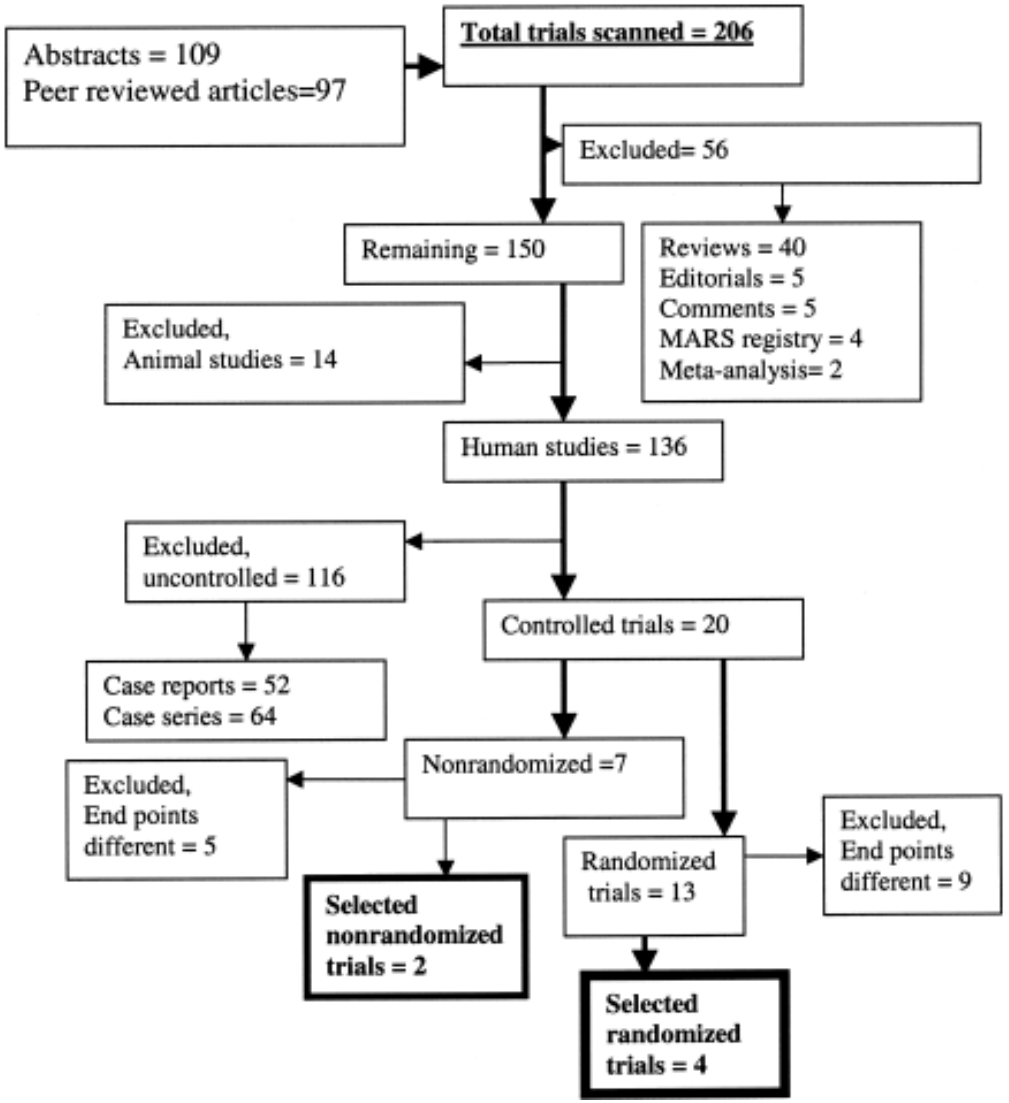
Outcome: 1 Mortality



Molecular Adsorbent Recirculating System for Acute and Acute-on-Chronic Liver Failure: A Meta-analysis

Mohammed S. Khuroo,[1] Mehnaaz S. Khuroo,[2] and Karim L.C. Farahat[1]

1974 - 2002



Khuroo MS et al Liver Transpl, 2004; 10: 1099-1106

All-cause-mortality

Relative risk, random model
Bilateral CI, 95% for trials, 95% for MA

		T+	T-
AOCLF			
Mitzner 2001		6/8	5/5
Heeman 2002		1/12	6/12
Total	0.498, p=0.35	7/20	11/17
ALF			
Schmidt 2003		3/8	2/5
El-Banayosy 2003		2/8	8/9
Total	0.489, p=0.23	5/16	10/14
Total	0.564, p=0.11	12/36	21/31

Treatment better | Control better

Rel. Risk: 0.0 | 0.1 | 0.3 | 1.0 | 2 | 4

Events/Sizes

Khuroo MS et al Liver Transpl, 2004; 10: 1099-1106

Meta-analysis

Systematic review and meta-analysis of survival following extracorporeal liver support

B. M. Stutchfield[1], K. Simpson[2] and S. J. Wigmore[1]

Janvier 1995 à janvier 2010

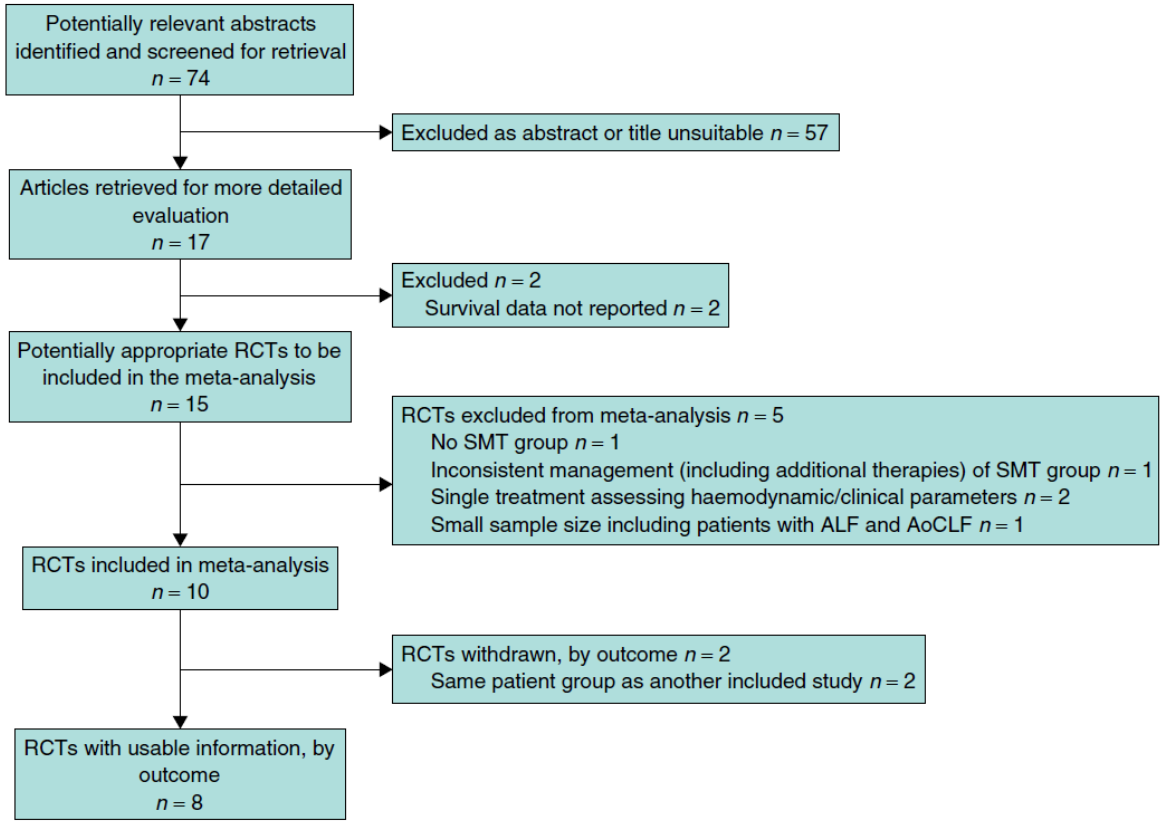


Fig. 1 Trial flow diagram according to PRISMA statement[9]. RCT, randomized controlled trial; SMT, standard medical therapy; ALF, acute liver failure; AoCLF, acute-on-chronic liver failure

British Journal of Surgery 2011; 98: 623-631

Meta-analysis

Systematic review and meta-analysis of survival following extracorporeal liver support

B. M. Stutchfield[1], K. Simpson[2] and S. J. Wigmore[1]

Reference	Acute liver failure ELS	SMT	Weight (%)	Risk ratio
Bio → Demetriou *et al.*[5]	20 of 73	30 of 74	57·8	0·68 (0·42, 1·08)
Mars → El Banayosy *et al.*[14]	7 of 14	9 of 13	30·7	0·72 (0·38, 1·37)
Bio → Ellis *et al.*[13]	4 of 12	5 of 12	11·5	0·80 (0·28, 2·27)
Total	31 of 99	44 of 99	100·0	0·70 (0·49, 1·00)

Heterogeneity: $\tau^2 = 0{\cdot}00$; $\chi^2 = 0{\cdot}09$, 2 d.f., $P = 0{\cdot}95$, $I^2 = 0\%$

Test for overall effect: $Z = 1{\cdot}95$, $P = 0{\cdot}05$

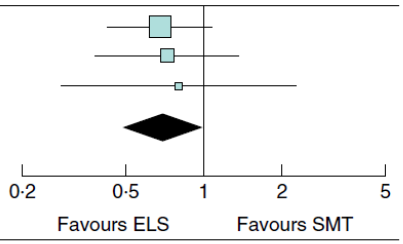


Fig. 2 Forest plot showing risk ratio with 95 per cent confidence interval for individual studies comparing extracorporeal liver support (ELS) with standard medical therapy (SMT) in acute liver failure. The Mantel–Haenszel random-effects method was used

Reference	Acute-on-chronic liver failure ELS	SMT	Weight (%)	Risk ratio
Mars → Ellis *et al.*[18]	5 of 5	5 of 5	34·7	1·00 (0·71, 1·41)
Mars → Hassanein *et al.*[4]	19 of 39	17 of 31	26·3	0·89 (0·56, 1·40)
Mars → Heemann *et al.*[15]	1 of 12	7 of 11	2·5	0·13 (0·02, 0·90)
Mars → Mitzner *et al.*[17]	6 of 8	5 of 5	25·1	0·79 (0·49, 1·26)
Biologic-Dt → Sen *et al.*[16]	5 of 9	5 of 9	11·4	1·00 (0·44, 2·29)
Total	36 of 73	39 of 61	100·0	0·87 (0·64, 1·18)

Heterogeneity: $\tau^2 = 0{\cdot}04$; $\chi^2 = 6{\cdot}20$, 4 d.f., $P = 0{\cdot}18$, $I^2 = 35\%$

Test for overall effect: $Z = 0{\cdot}89$, $P = 0{\cdot}37$

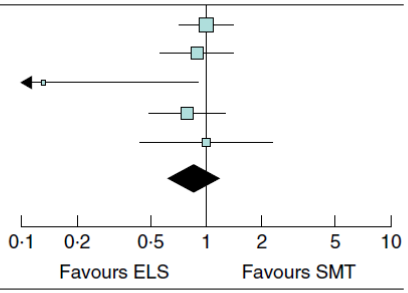
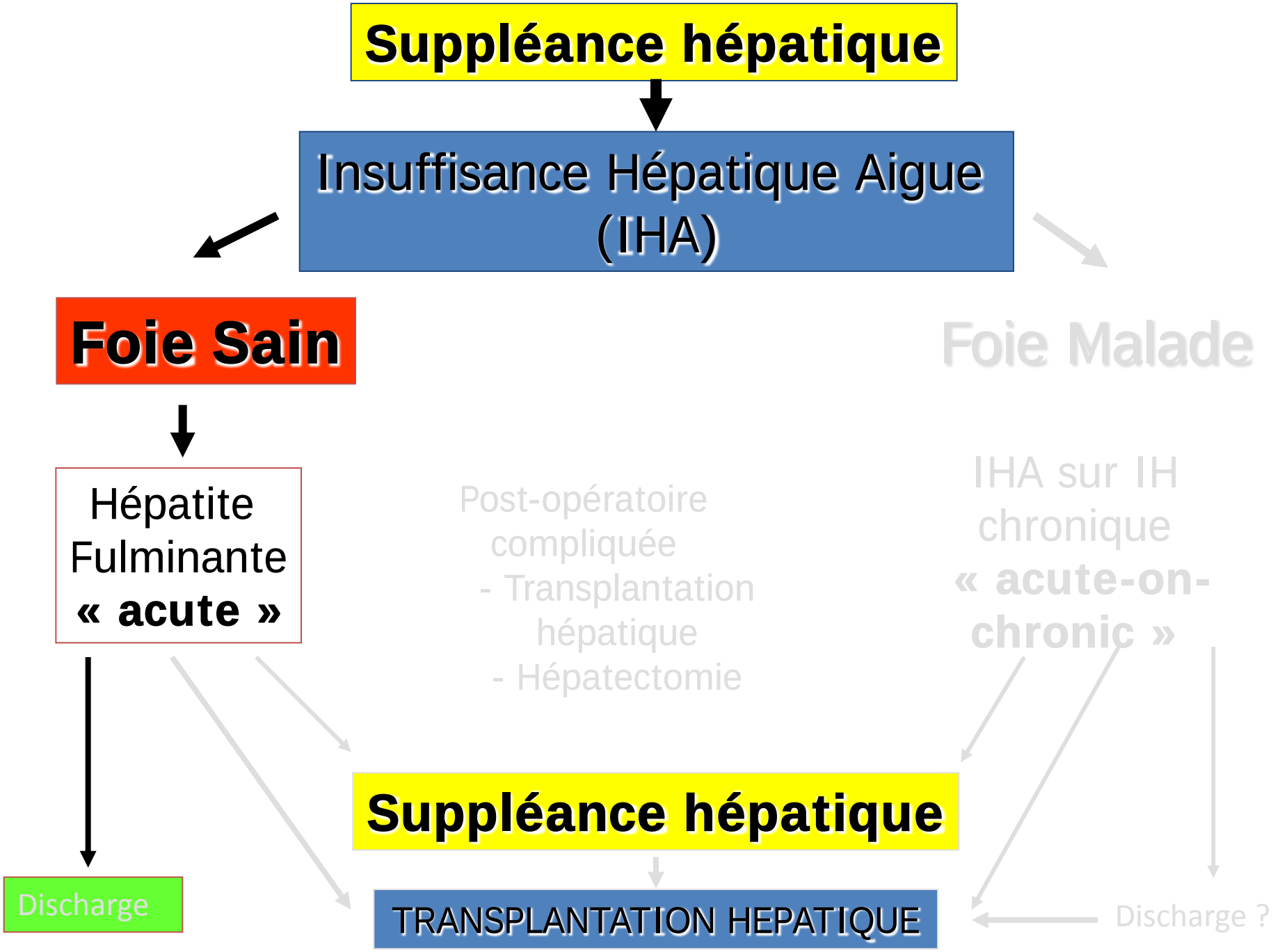
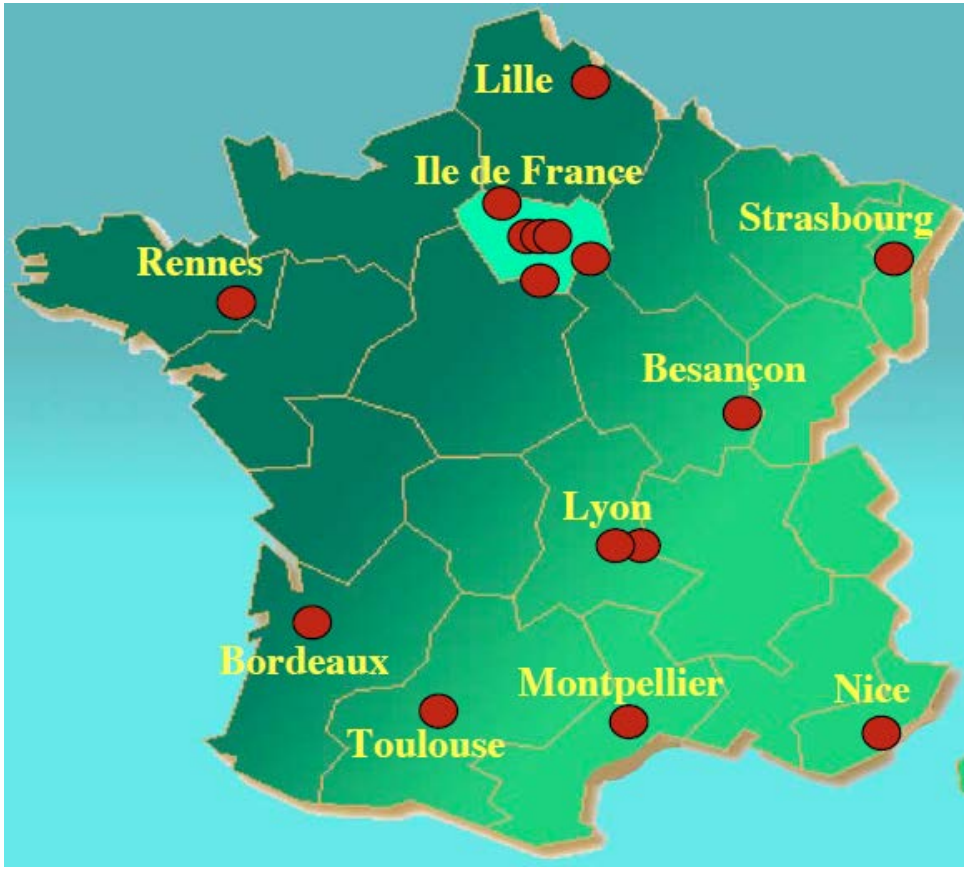


Fig. 3 Forest plot showing risk ratio with 95 per cent confidence interval for individual studies comparing extracorporeal liver support (ELS) with standard medical therapy (SMT) in acute-on-chronic liver failure. The Mantel–Haenszel random-effects method was used

British Journal of Surgery 2011; 98: 623-631

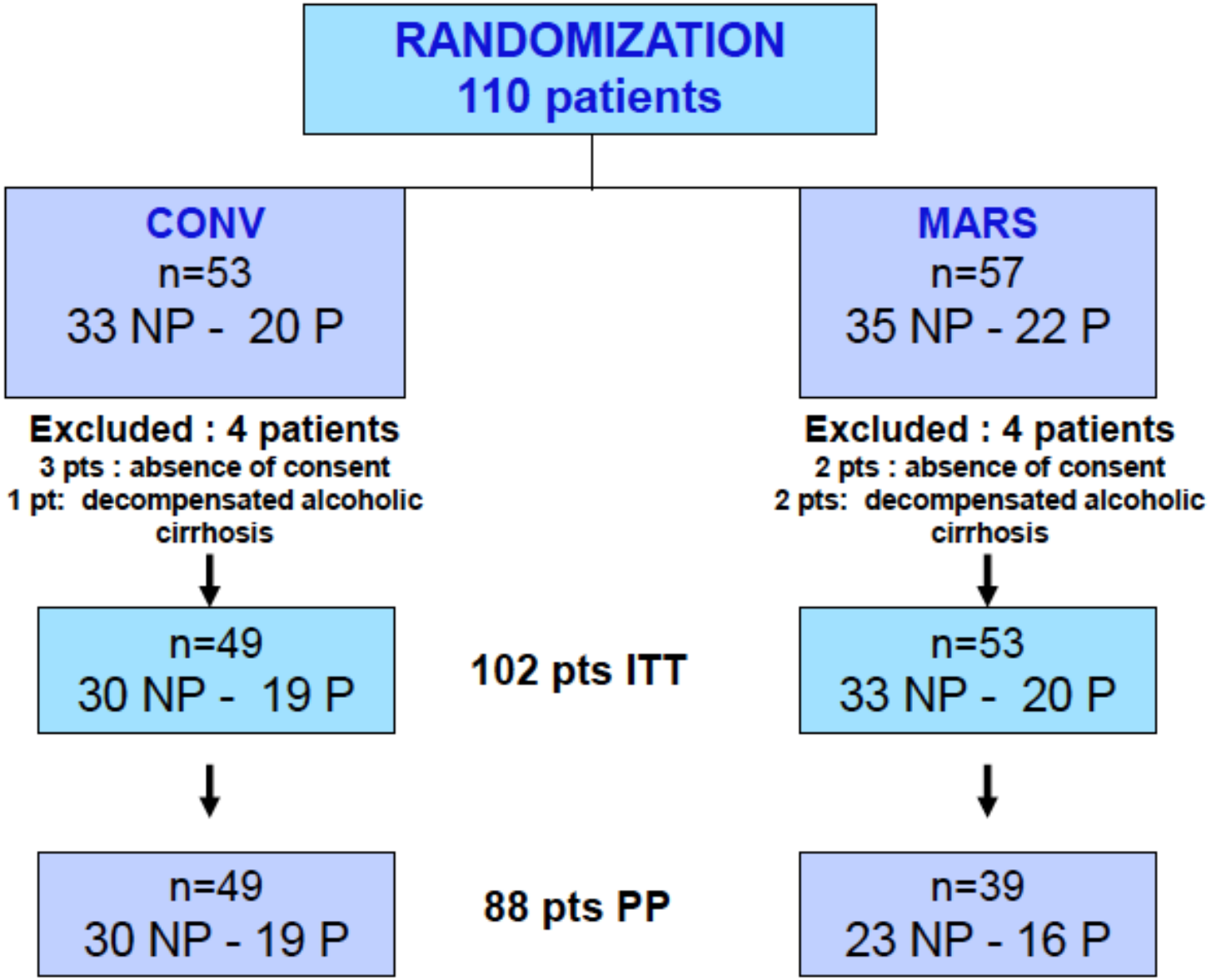

Suppléance hépatique
Insuffisance Hépatique Aigue (IHA)
Foie Sain
Foie Malade
Hépatite Fulminante « acute »
Post-opératoire compliquée
- Transplantation hépatique
- Hépatectomie
IHA sur IH chronique « acute-on-chronic »
Suppléance hépatique
Discharge
TRANSPLANTATION HEPATIQUE
Discharge ?

Fulmar Study

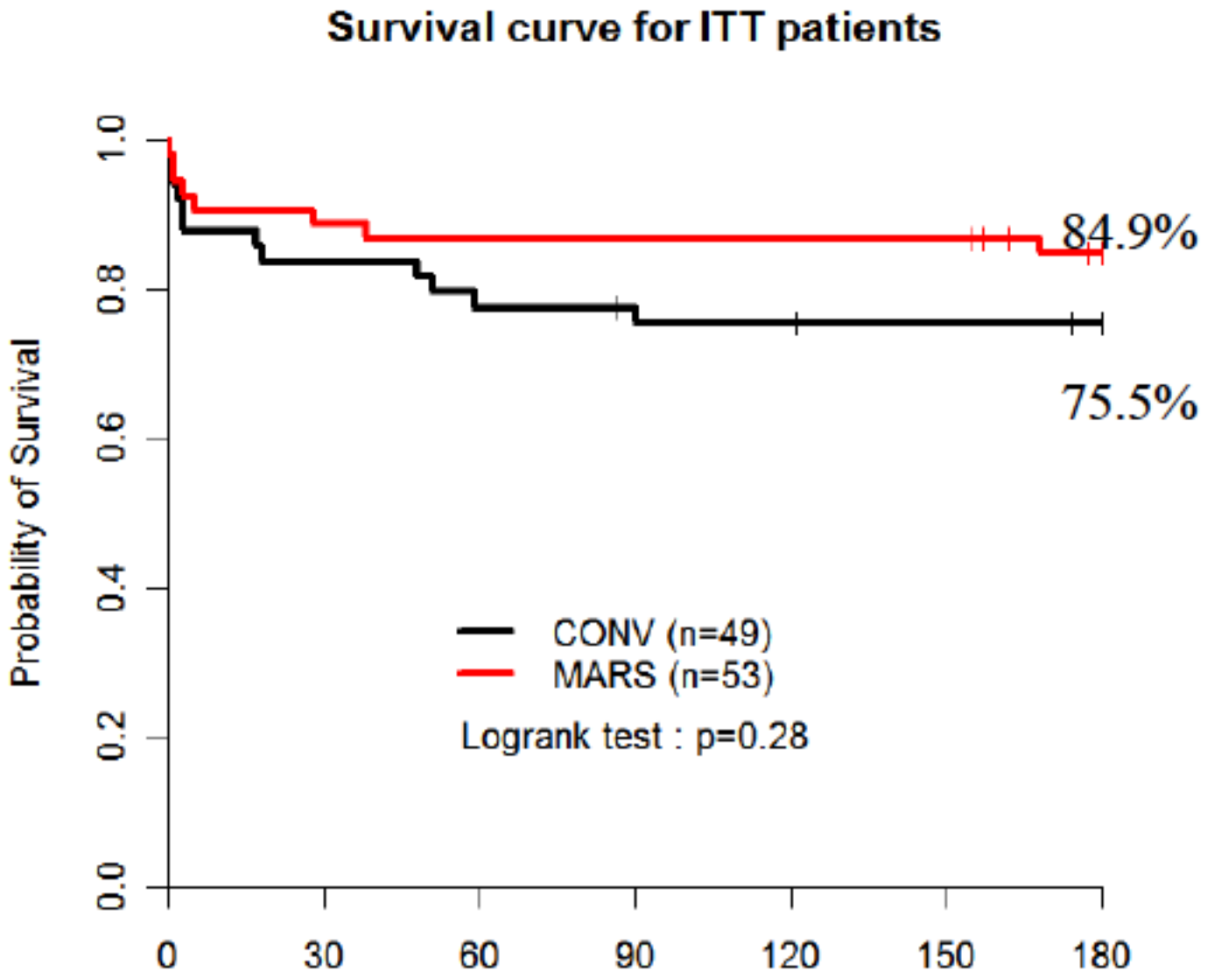


Saliba F, Camus C, Durand F, *et al*. Randomized controlled multicenter trial evaluating the efficacy and safety of albumin dialysis with MARS® in patients with fulminant and subfulminant hepatic failure. *Hepatology* 2008; **48** (Suppl. 4): 377A.

Fulmar Study

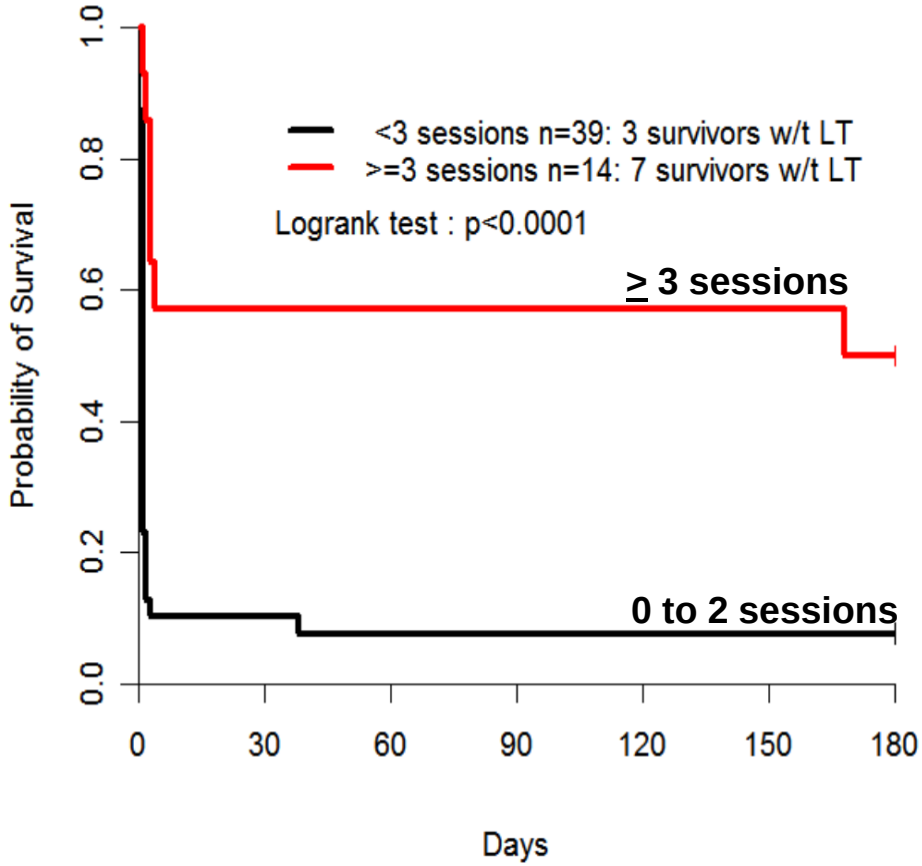


Saliba F, et al. FULMAR study group. *Hepatology* 2008; 48: Abstract LB4.

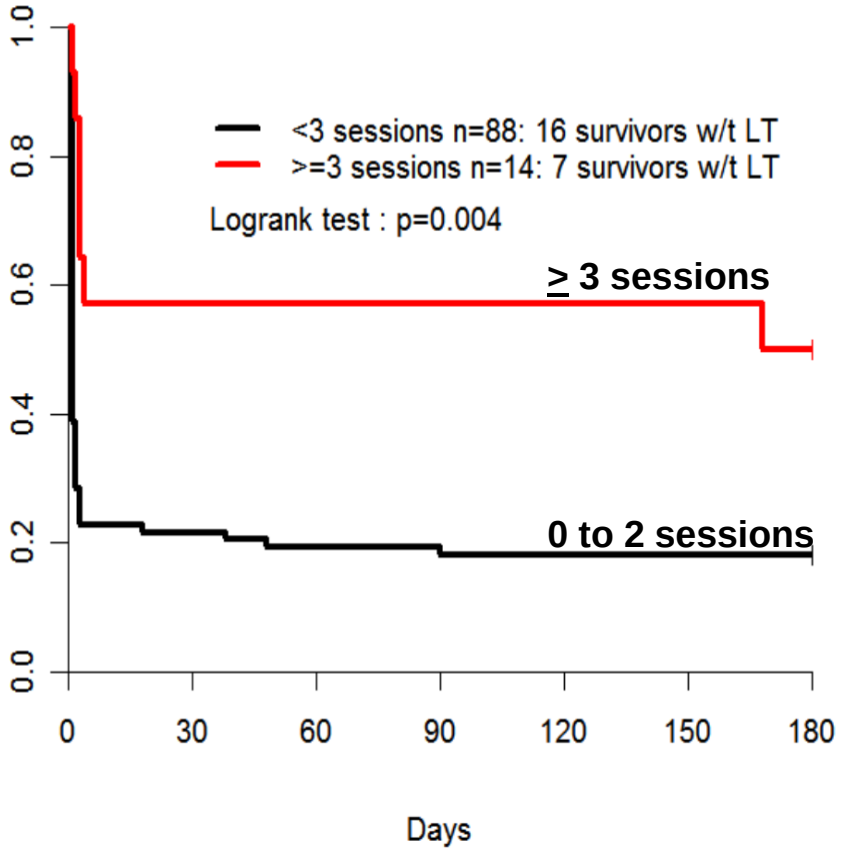


Saliba F, et al. FULMAR study group. *Hepatology* 2008; 48: Abstract LB4.

Within MARS group
n= 53



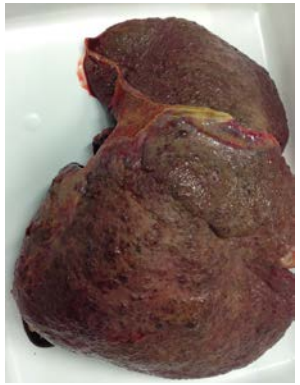
All ITT population
n= 102



Saliba F, et al. FULMAR study group. *Hepatology* 2008; 48: Abstract LB4.

Suppléance hépatique

Insuffisance Hépatique Aigue (IHA)



Foie Sain

Foie Malade

Hépatite Fulminante **« acute »**

Post-opératoire compliquée
- Transplantation hépatique
- Hépatectomie

IHA sur IH chronique **« acute-on-chronic »**

Suppléance hépatique

Discharge

TRANSPLANTATION HEPATIQUE

Discharge ?

EXPERT REVIEWS

Acute-on-chronic liver failure: current concepts on definition, pathogenesis, clinical manifestations and potential therapeutic interventions

Expert Rev. Gastroenterol. Hepatol. 5(4), 523–537 (2011)

Table 2. Molecular adsorbent recirculating system and Prometheus® in acute-on-chronic liver failure.

Study (year)	Patients (n)	Controlled	Improvement in			Survival (%)	Ref.
			Biochemical	*CVS*	*CNS*		
MARS®							
Stange *et al.* (1999)	13	No	Yes	NA	Yes	69	[96]
Schmidt *et al.* (2001)	8	No	Yes	Yes	No	50	[64]
Jalan *et al.* (2003)	8	No	Yes	Yes	Yes	50	[97]
Di Campli *et al.* (2005)	13	No	Yes	NA	Yes	38	[98]
Mitzner *et al.* (2000)	13	Yes	Yes	Yes	No	38	[99]
Heemann *et al.* (2002)	23	Yes	Yes	Yes	Yes	37.5 vs 0	[100]
Sen *et al.* (2004)	18	Yes	Yes	No	Yes	90 vs 55	[101]
Hassanein *et al.* (2007)	70	Yes	NA	NA	Yes	NA	[102]
Laleman *et al.* (2006)	18	Yes	Yes	No	NA	66 vs 33 vs 33	[65]
Prometheus®							
Rifai *et al.* (2003)	11	No	Yes	No	No	28	[89]
Laleman *et al.* (2006)	18	Yes	Yes	No	NA	66 vs 33 vs 33	[65]

CVS: Cardiovascular; MARS: Molecular adsorbent recirculating system; NA: Not applicable.

However, developing an effective liver assist technology has proven to be difficult because of the complexity of liver functions that must be replaced, as well as heterogeneity of the patient population. Initial experiences suggest a beneficial role of albumin dialysis, and in particular MARS, with regard to detoxification, hemodynamic improvement and renal recovery

Trials should not combine acute liver failure and AoCFL, and different etiologies will have to be evaluated separately. The definite and published results of the recently terminated powered randomized controlled trials are urgently awaited.

RELIEF et HELIOS Studies

Expert Rev. Gastroenterol. Hepatol. 5(4), (2011)

HEPATOLOGY
Official Journal of the American Association for the Study of Liver Diseases

Extracorporeal Albumin Dialysis With the Molecular Adsorbent Recirculating System in Acute-on-Chronic Liver Failure: The RELIEF Trial

Rafael Bañares,[1,2,3] Frederik Nevens,[4] Fin Stolze Larsen,[5] Rajiv Jalan,[6] Agustín Albillos,[3,7,8] Matthias Dollinger,[9] Faouzi Saliba,[10,11,12] Tilman Sauerbruch,[13] Sebastian Klammt,[14] Johann Ockenga,[15] Albert Pares,[3,16,17] Julia Wendon,[18] Tanja Brünnler,[19] Ludwig Kramer,[20] Philippe Mathurin,[21] Manuel de la Mata,[3,22,23] Antonio Gasbarrini,[24] Beat Müllhaupt,[25] Alexander Wilmer,[4] Wim Laleman,[4] Martin Eefsen,[5] Sambit Sen,[6] Alexander Zipprich,[9] Teresa Tenorio,[7] Marco Pavesi,[26] Hartmut H.-J. Schmidt,[27] Steffen Mitzner,[14] Roger Williams,[28] and Vicente Arroyo[3,16,17] on behalf of the RELIEF study group

HEPATOLOGY, Vol. 57, No. 3, 2013

Relief study

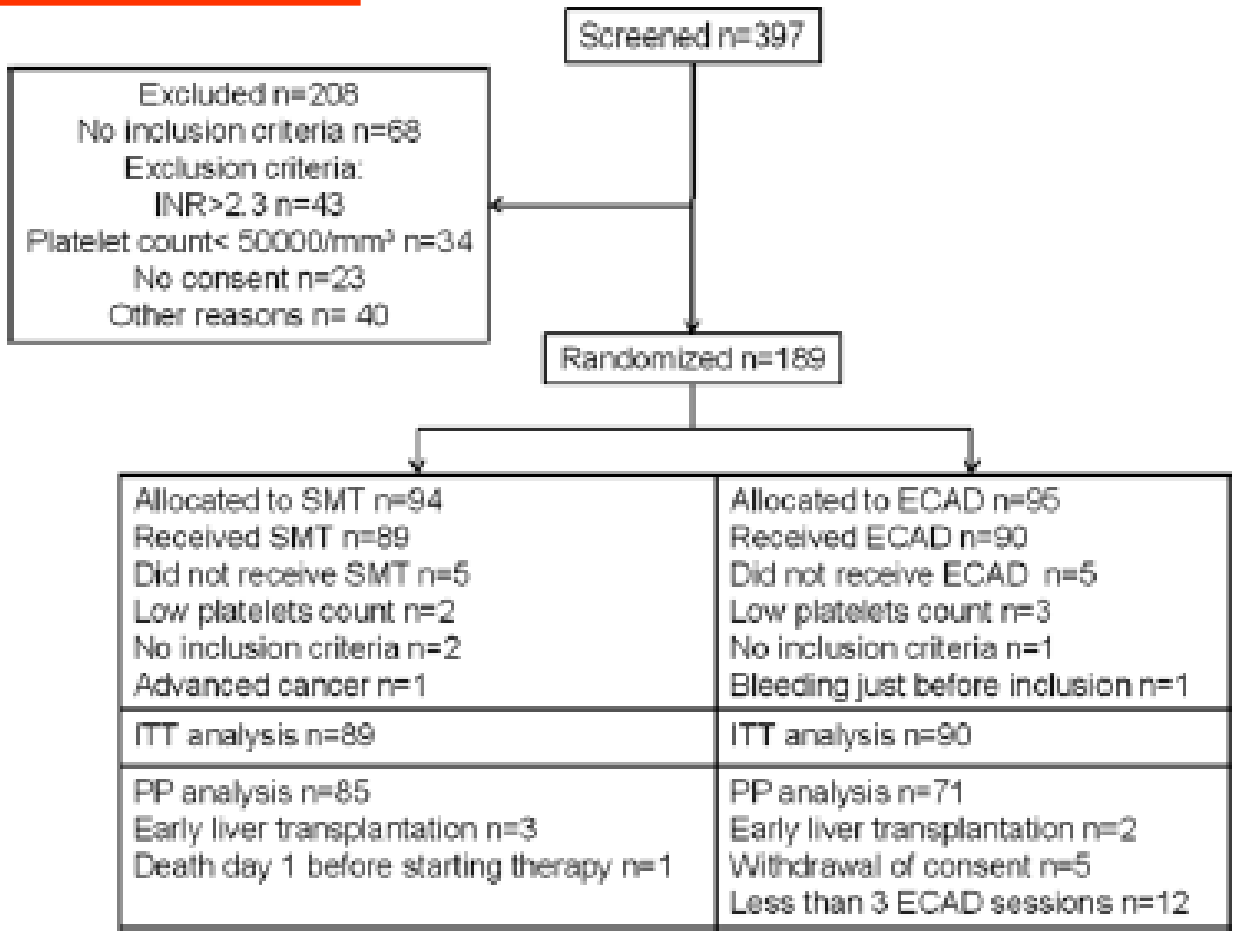


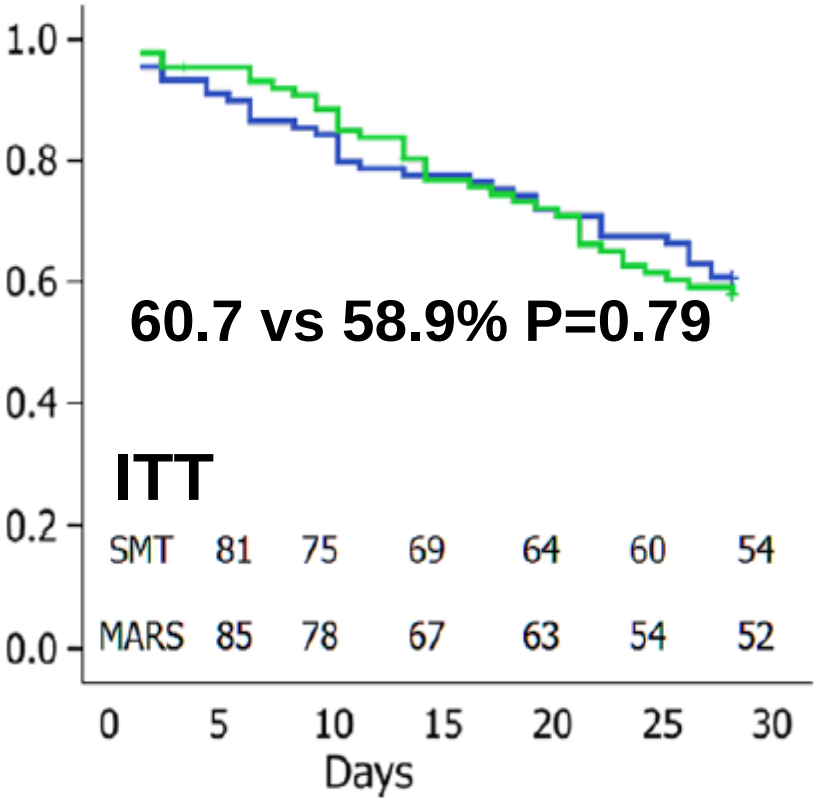
Fig. 1. Screening and randomization of patients.

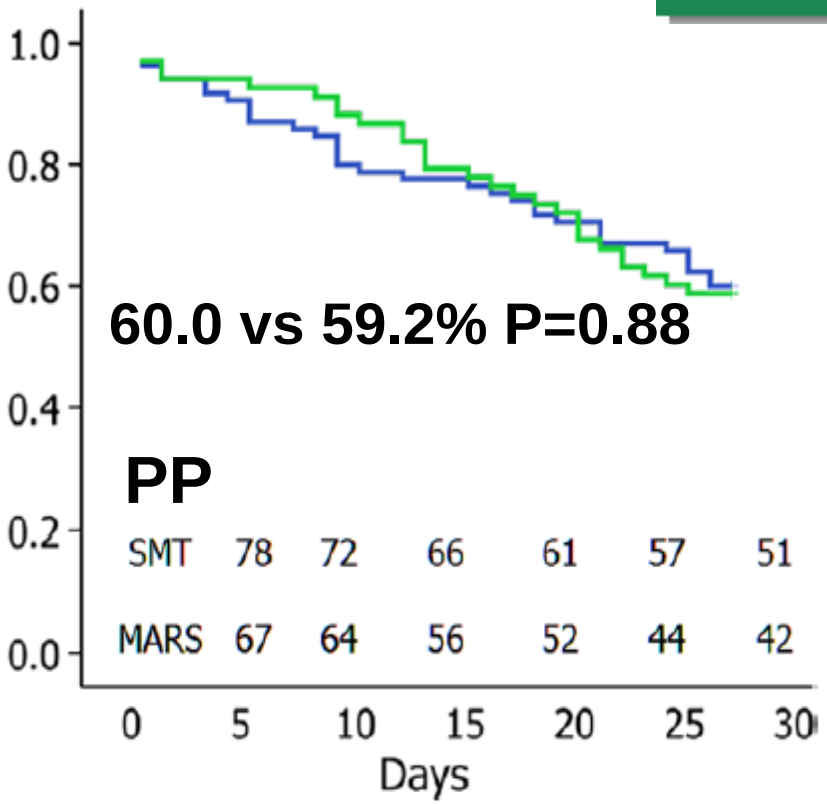
HEPATOLOGY, Vol. 57, No. 3, 2013

Survie sans TH J28

SMT

MARS + SMT





Survie sans transplantation J28:

HEPATOLOGY, Vol. 57, No. 3, 2013

Résultats

- **<u>Survie sans transplantation à J90:</u>**

- ITT 46.1 vs 42.2% P=0.71
- PP 44.7 vs 43.7% P=0.97

Survie sans transplantation J90:

Pas de différence significative

HEPATOLOGY, Vol. 57, No. 3, 2013

Table 4. Changes in Laboratory Parameters at Day 4

Laboratory Parameter	MARS	SMT	*P* value
Bilirubin (mg/dl)			
Baseline	26.30 (11.66)	26.65 (11.54)	
Day 4	17.58 (6.90)	24.15 (11.30)	
Percentage of change (from baseline value)	-26.4 (26.12)	-8.92 (9.47)	<0.001
Creatinine (mg/dl)			
Baseline	2.24 (2.01)	2.13 (1.97)	
Day 4	1.43 (1.09)	1.67 (1.29)	
Percentage of change (from baseline value)	-.20.04 (35.06)	-6.43 (33.50)	0.022
Serum sodium (mEq/l)			
Baseline	132.81 (8.82)	132.59 (8.18)	
Day 4	136. 35 (5.83)	134.34 (7.89)	
Percentage of change (from baseline value)	2.94 (5.42)	1.44 (4.73)	0.081
Albumin (g/l)			
Baseline	26.78 (5.64)	27.47 (7.13)	
Day 4	28.42 (5.86)	28.61 (7.75)	
Percentage of change (from baseline value)	7.83 (18.84)	5.67 (23.22)	0.587
INR			
Baseline	1.73 (0.32)	1.77 (0.34)	
Day 4	1.72 (0.44)	1.88 (0.49)	
Percentage of change (from baseline value)	0.00 (19.82)	6.38 (23.63)	0.098
Hemoglobin (g/dl)			
Baseline	9.88 (1.59)	10.26 (1.99)	
Day 4	8.99 (1.16)	10.10 (1.79)	
Percentage of change (from baseline value)	-7.16 (16.35)	-0.15 (15.47)	0.009
Platelets ($*10^3/mm^3$)			
Baseline	133.17 (76.62)	122.71 (73.90)	
Day 4	91.14 (65.05)	114.08 (73.47)	
Percentage of change	-29.06 (29.37)	-1.80 (40.59)	<0.001

Pas de différence à J21

HEPATOLOGY, Vol. 57, No. 3, 2013

- **Régression du syndrome hépato-rénal:**
  (Créatinine < 1.5mg/dL à J4 pour les SHR à l'inclusion)
  - MARS (J4) 16/34 [47.1%]
  - SMT 10/38 [26.3%]
    OR 0.40; 95% CI 0.15-1.07; P=0.07
- **Diminution de l'encéphalopathie hépatique:**
  (II-IV→0-I)
  - MARS 15/24 [62.5%]
  - SMT 13/34 [38.2%]
    OR: 0.37; 95% CI 0.12-1.09; P=0.07

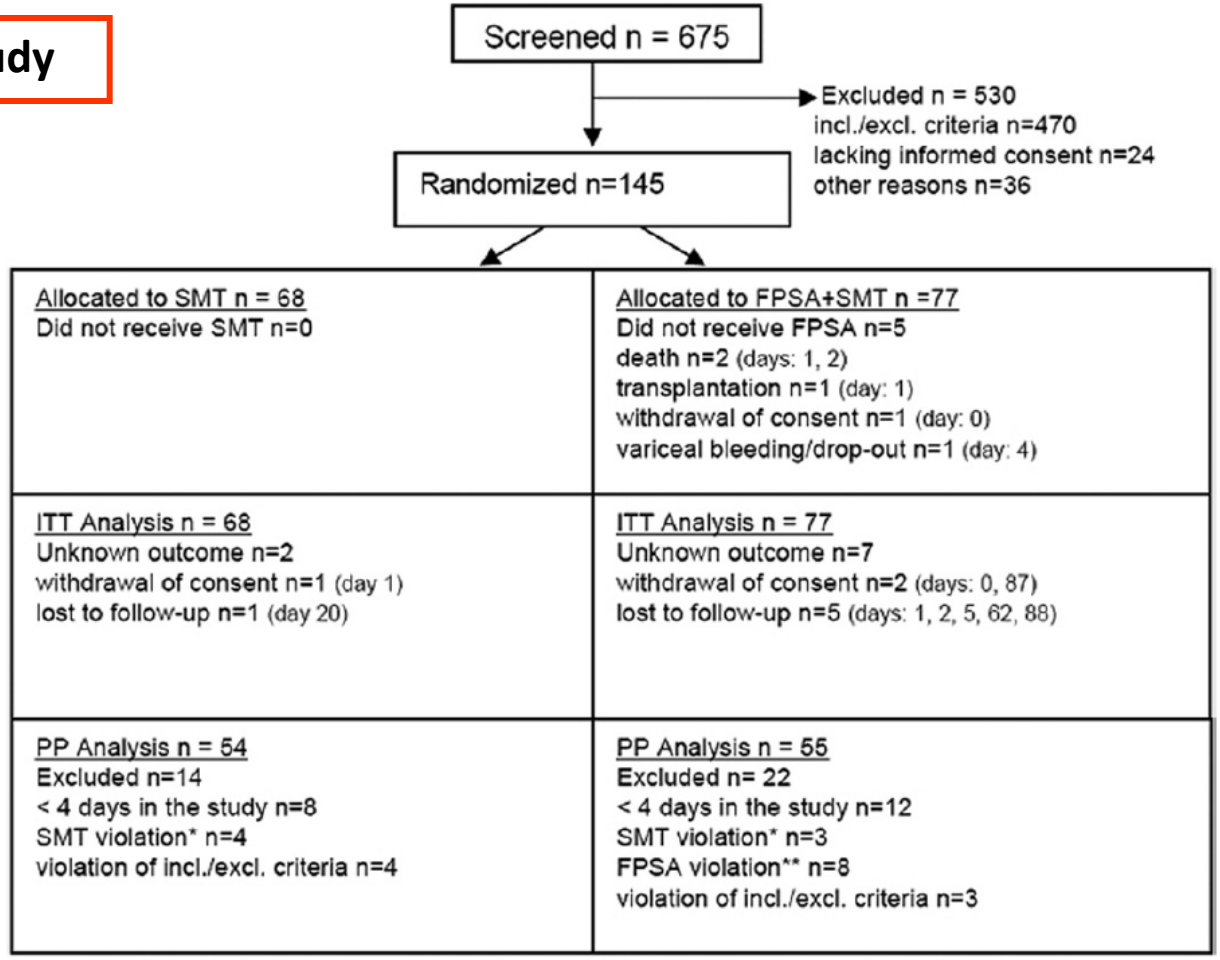
- **Ventilation mécanique et Durée d'Hospitalisation:**
  - Pas de différence significative

HEPATOLOGY, Vol. 57, No. 3, 2013

Effects of Fractionated Plasma Separation and Adsorption on Survival in Patients With Acute-on-Chronic Liver Failure

ANDREAS KRIBBEN,* GUIDO GERKEN,‡ SEBASTIAN HAAG,‡ STEFAN HERGET–ROSENTHAL,* ULRICH TREICHEL,‡

Helios study



Prometheus®)

Gastroenterology 2012; 142: 782-789

Effects of Fractionated Plasma Separation and Adsorption on Survival in Patients With Acute-on-Chronic Liver Failure

ANDREAS KRIBBEN,* GUIDO GERKEN,‡ SEBASTIAN HAAG,‡ STEFAN HERGET–ROSENTHAL,* ULRICH TREICHEL,‡

Helios study

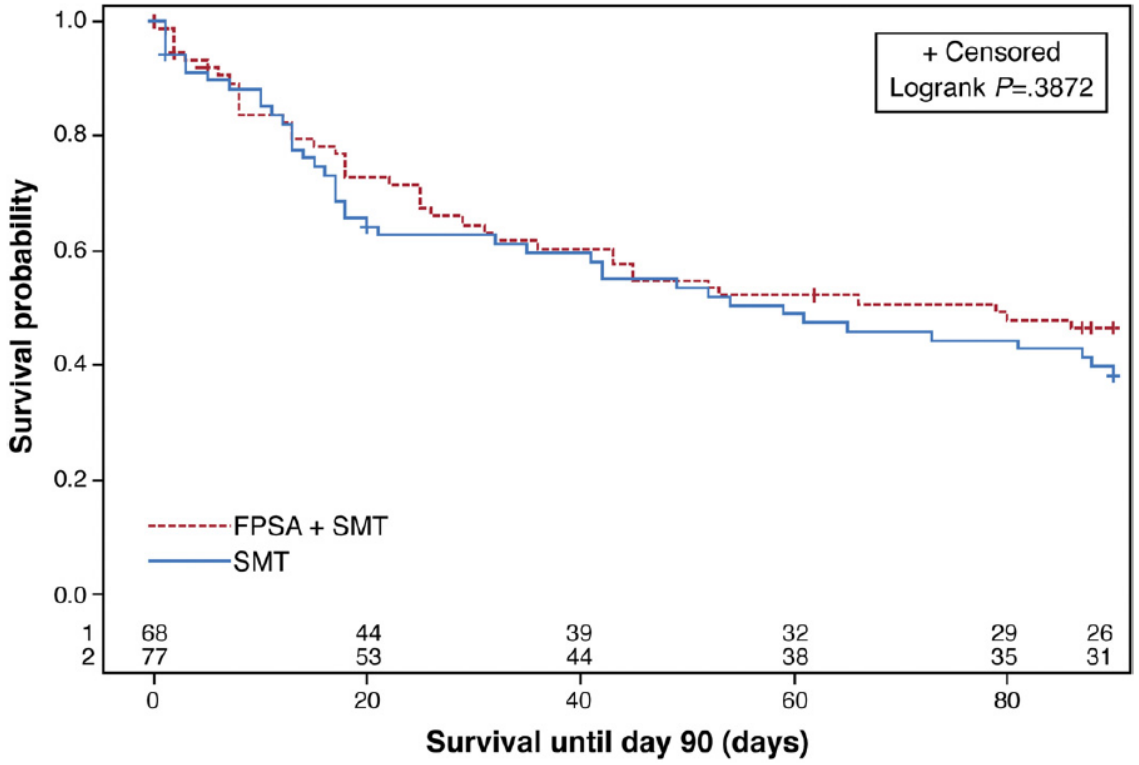


Figure 1. Kaplan–Meier survival curve; ITT population.

CONCLUSIONS:
Among all patients with AOCLF, extracorporeal liver support with FPSA does not increase the probability of survival. Further studies are needed to assess whether therapy might be beneficial in specific subsets of patients.

Gastroenterology 2012; 142: 782-789

Effects of Fractionated Plasma Separation and Adsorption on Survival in Patients With Acute-on-Chronic Liver Failure

ANDREAS KRIBBEN,* GUIDO GERKEN,‡ SEBASTIAN HAAG,‡ STEFAN HERGET–ROSENTHAL,* ULRICH TREICHEL,‡

Helios study

Table 3. Effects of Treatment on Liver and Renal Function and Other Laboratory Parameters

Parameter	FPSA (n = 77)	SMT (n = 68)	*P* value
Serum bilirubin (*mg/dL*)			
Baseline	26 ± 15	25 ± 14	
Day 28	20 ± 14	25 ± 17	
Change from baseline	−8 ± 11	0 ± 9	<.0001
Serum albumin (*g/dL*)			
Baseline	3.0 ± 0.6	2.9 ± 0.5	
Day 28	3.1 ± 0.7	3.1 ± 0.8	
Change from baseline	0.1 ± 0.7	0.2 ± 0.7	.20
International normalized ratio			
Baseline	2.00 ± 0.42	1.98 ± 0.56	
Day 28	2.15 ± 0.85	2.11 ± 0.97	
Change from baseline	0.16 ± 0.77	0.13 ± 0.82	.83
Serum creatinine (*mg/dL*)			
Baseline	2.3 ± 2.0	2.3 ± 2.0	
Day 28	2.0 ± 1.5	2.2 ± 2.2	
Change from baseline	−0.2 ± 1.7	−0.1 ± 1.7	.60
Serum sodium (*mEq/L*)			
Baseline	135 ± 6	135 ± 7	
Day 28	137 ± 5	134 ± 6	
Change from baseline	−2.5 ± 6.5	0.7 ± 6.7	.08
Hemoglobin (*g/dL*)			
Baseline	9.9 ± 1.5	10.1 ± 1.8	
Day 28	9.7 ± 1.4	9.8 ± 1.8	
Change from baseline	−0.2 ± 1.4	−0.4 ± 1.9	.15
Platelets ($\times 10^3/\mu L$)			
Baseline	93 ± 53	117 ± 124	
Day 28	78 ± 43	101 ± 99	
Change from baseline	−15 ± 42	−16 ± 70	.44

Gastroenterology 2012; 142: 782-789

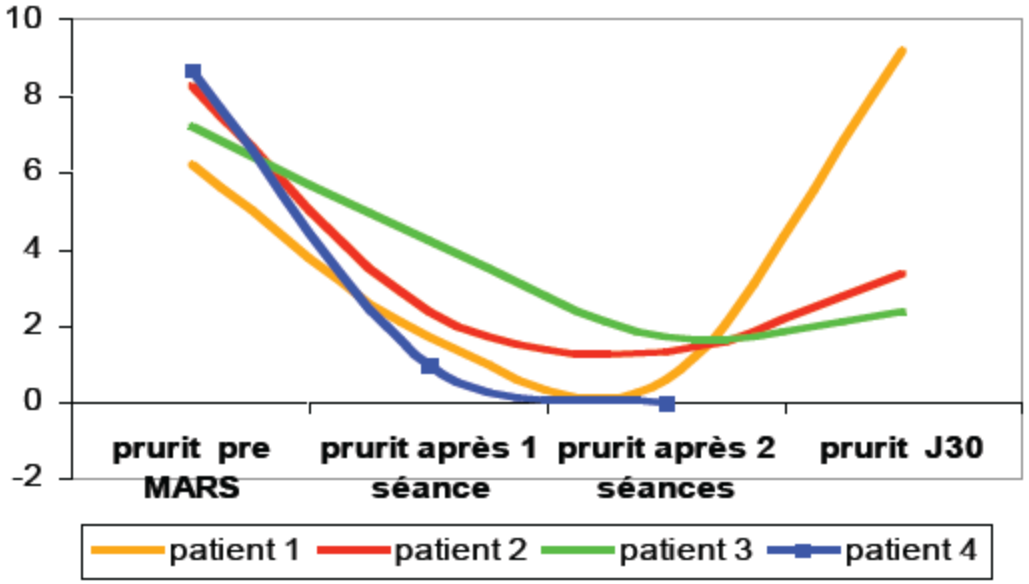
Efficacité sur le prurit

Albumin liver dialysis as saving procedure in cholestatic liver disease and intractable pruritus.

Lemoine M, Revaux A, Francoz C, Ducarme G, Brechignac S, Jacquemin E, Uzan M, Ganne-Carrie N.

World J Gastroenterol. 2008 Nov 14;14(42):6572-4

- 2 séances de 8H/J
- Evaluation clinique pré et post MARS
  - Prurit (EVA)
  - Asthénie
- Evaluation biologique
  - Bilirubine, plaquette, TP, acides biliaires



Treatment of resistant pruritus from cholestasis with albumin dialysis: Combined analysis of patients from three centers

Albert Parés[1,*], Manuel Herrera[2], Juan Avilés[3], Miquel Sanz[1], Antoni Mas[1]

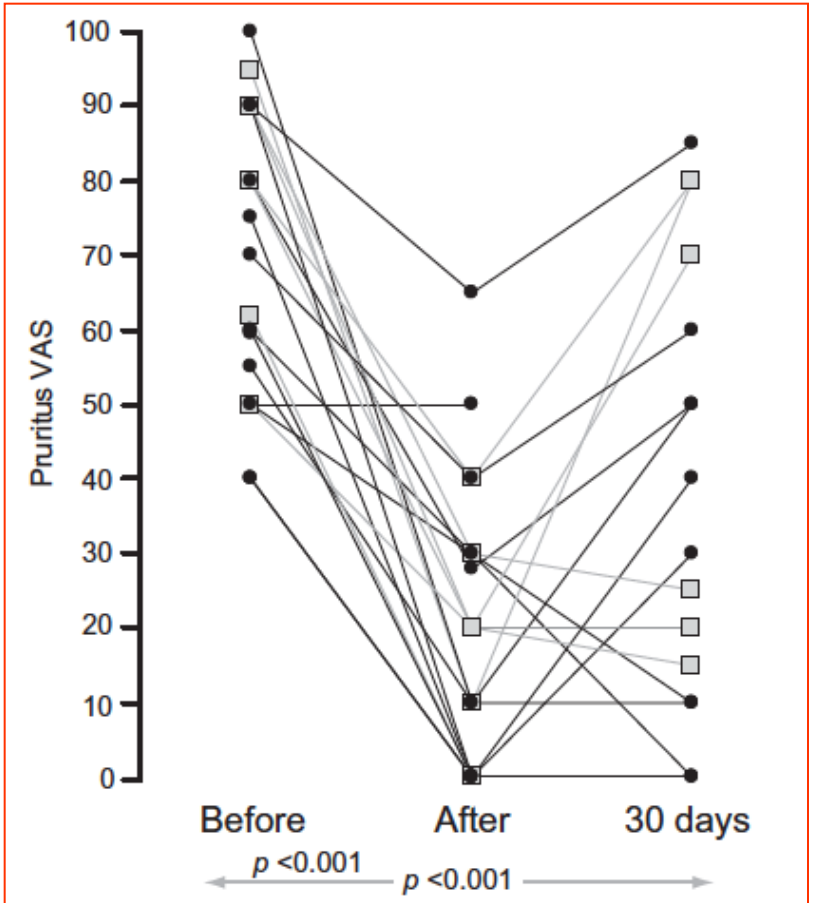


Fig. 1. Intensity of pruritus assessed by visual analogue score (VAS) before and after treatment with MARS. (chronic cholestatic patients: black line; graft-rejection: grey line).

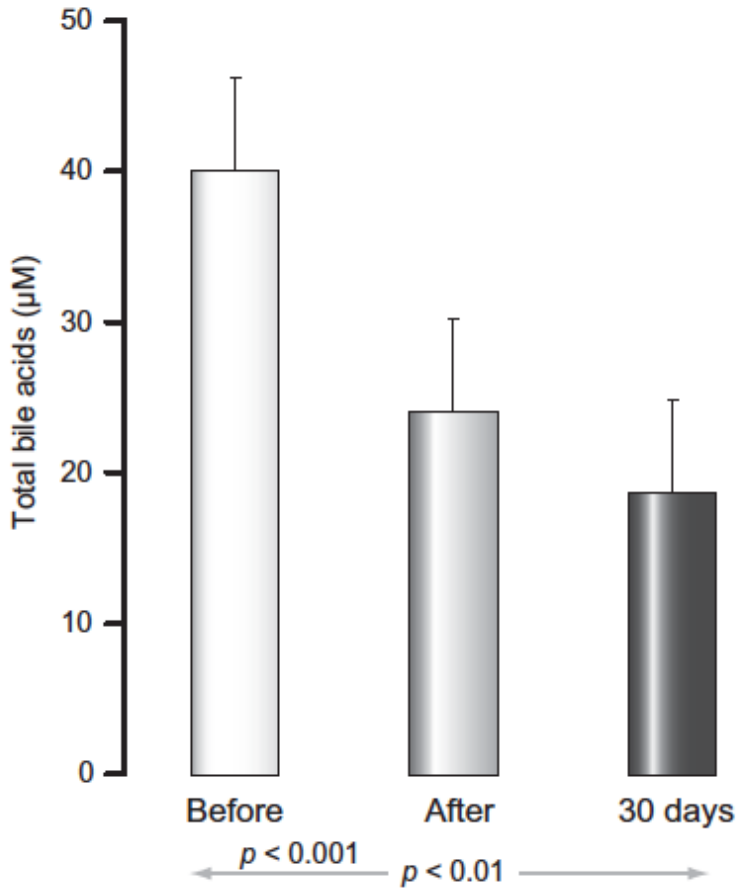


Fig. 2. Circulating bile acid concentrations in patients with pruritus before and after treatment with MARS.

Journal of Hepatology 2010 vol. 53 / 307-312

Intérêt en toxicologie

- Insuffisance hépatique d'origine toxique
  - champignons
  - Paracétamol

- Elimination des médicaments liés à l'albumine
  - Phynétoine
  - Théophyline
  - Antagonistes calciques
  - Valproate de sodium ….

Complications

Ceux d'une circulation extracorporelle

Thrombopénie
CIVD
Baisse du Fibrinogène et facteurs de coagulation
Déglobulisation

CONCLUSION (1/3)

- Aucun moyen ne permet de remplacer efficacement les multiples fonctions hépatiques

-Suppléance hépatique = « SUPER DIALYSE » pour épurer les toxines à forte affinité pour l'albumine.

- Pas de suppléance de la fonction de synthèse

- Cout/bénéfice = non évalué

CONCLUSION (2/3)

- Efficace sur certains SYMPTOMES de l'insuffisance hépatique

- Efficacité sur le prurit réfractaire

- Intérêt en toxicologie

- Etudes RCT = pas de réduction « évidente » de la mortalité sans transplantation dans l'insuffisance hépatique aigue ou dans la décompensation aigue de la cirrhose

CONCLUSION (3/3)

Objectif de la suppléance hépatique est :

Améliorer la survie de quelques jours

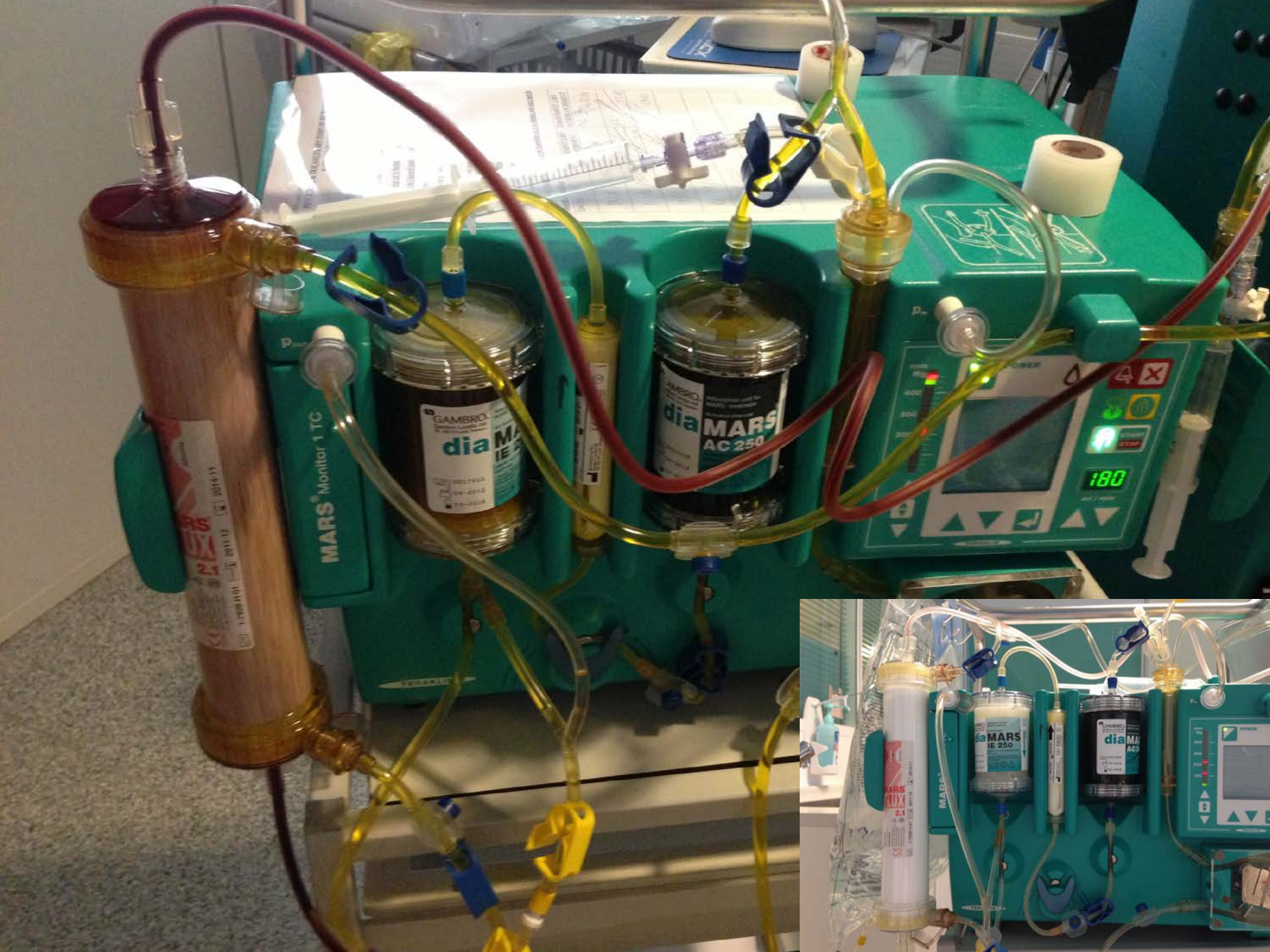
Pour permettre une transplantation hépatique

Pour attendre une récupération hépatique et éviter la transplantation

Toujours

Après une prise en charge médicale optimale (défaillance hépatique, NAC, hypothermie, sepsis)

Avant le stade de défaillance multiviscérales, qui contrindique la transplantation


MARS® Monitor 1 TC
GAMBRO
diaMARS AC 250
180