

Gestion de l'Anémie Péri-opératoire

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Lacanau Mai 2019



Conflits d'intérêts

- J'ai, et/ou mon institution, avons reçu des subventions des laboratoires:
 - Vifor Pharma
 - PFIZER
 - Masimo

3 messages

- Il faut traiter l'anémie périopératoire
- Intérêt du FER et de l'EPO
- Intérêt des programmes de PBM

Anaemia and Surgery

J. N. LUNN,* M.D., F.F.A. R.C.S. ; P. C. ELWOOD,† M.D.

British Medical Journal, 1970, 3, 71-73

n=2.441 AG / 1.585 avec NFS préopératoire

TABLE I.—Distribution of Preoperative Haemoglobin Levels

Haemoglobin (g./100 ml.)	Males	Females	Haemoglobin (g./100 ml.)	Anémie	
				Males	Females
4	2	—	12	84	121
5	5	1	13	92	229
6	4	9	14	191	177
7	7	—	15	167	78
8	17	10	16	107	17
9	17	22	17+	45	5
10	17	25			
11	64	72			
			Totals	819*	766*

*Includes patients who died after operation and who are included in Table IV.

Association Anémie préopératoire & Mortalité

TABLE IV.—Distribution of Postoperative Deaths by Haemoglobin Level. Distribution Expected on a Null Hypothesis Shown in Parentheses

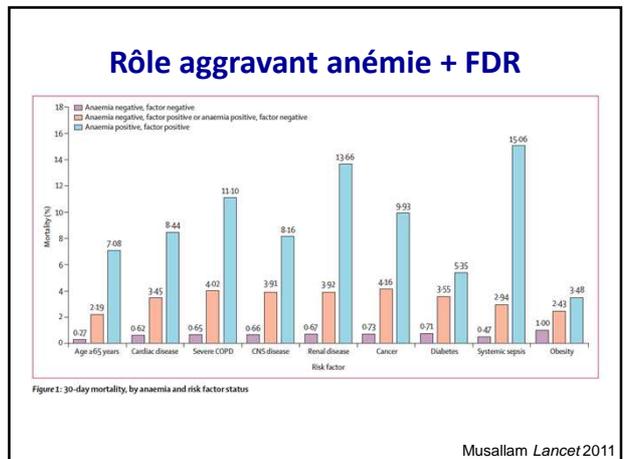
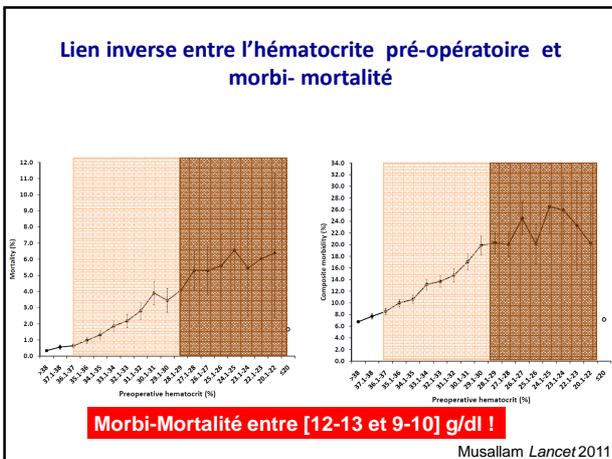
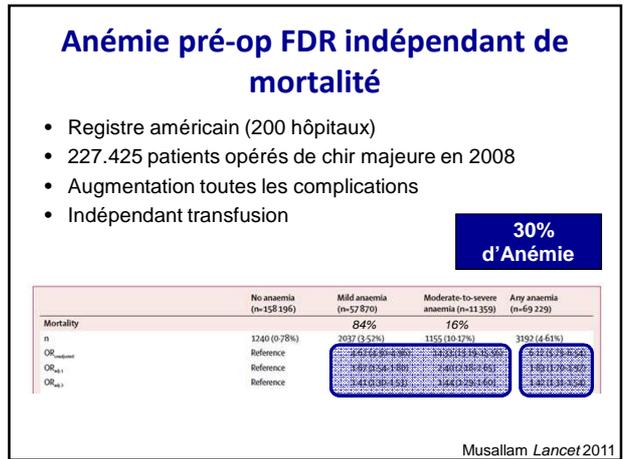
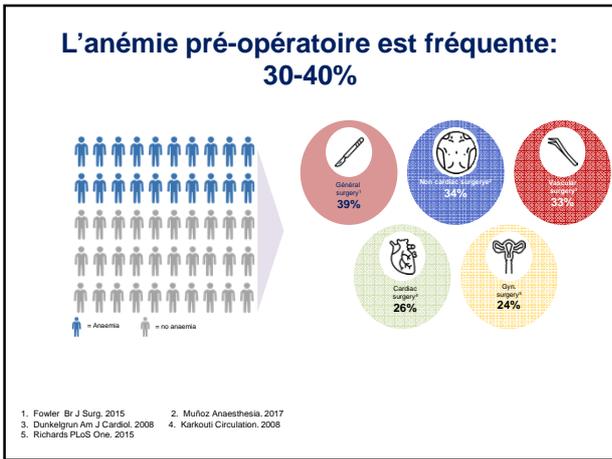
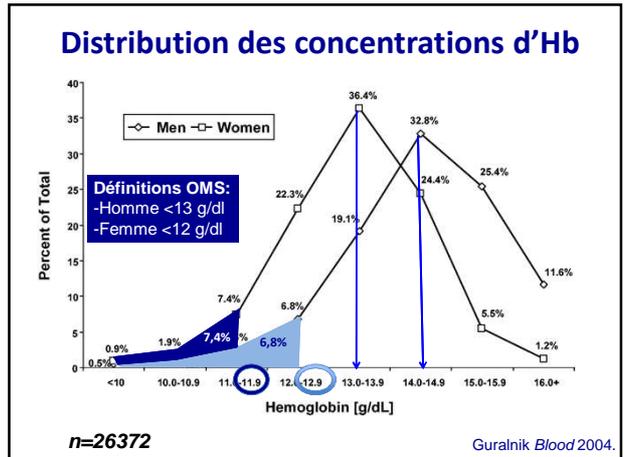
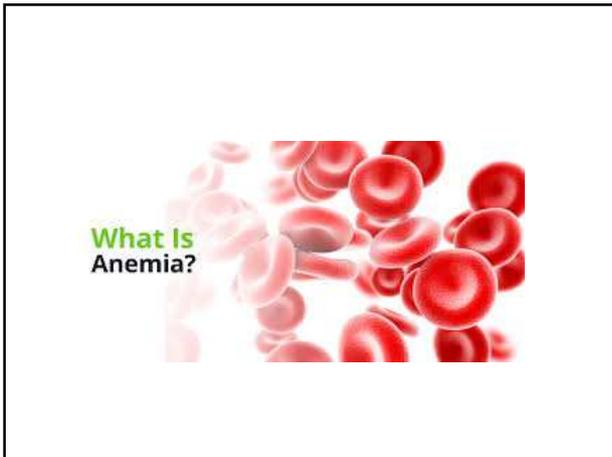
Haemoglobin Level	Males		Females	
	Deaths	Totals	Deaths	Totals
<10	8 (1.8)	52	8 (1.5)	42
10–	4 (3.5)	81	6 (3.5)	97
12–	8 (14.3)	367	5 (14.5)	527
15+	10 (10.4)	319	4 (3.6)	100
Total	30	819	23	766

$\chi^2 = 12.43$; D.F. = 2
0.01 > P > 0.001

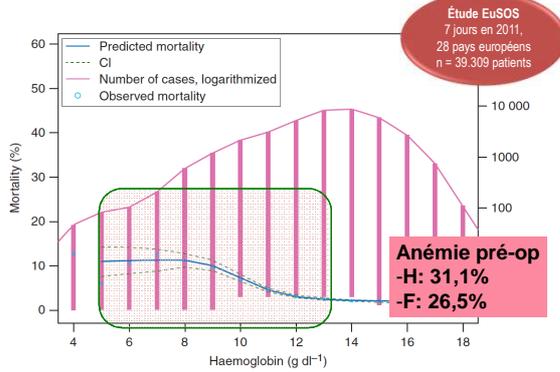
$\chi^2 = 21.32$; D.F. = 1
P < 0.001

Lunn *BMJ* 1970

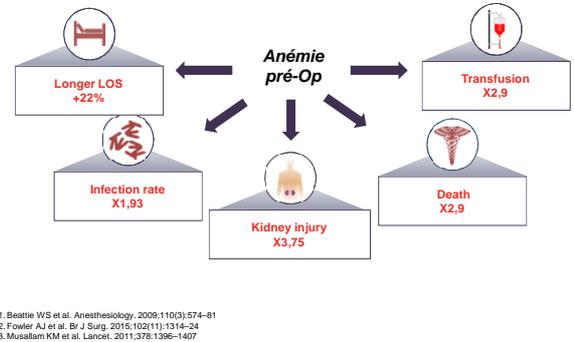
Rien depuis ?!



Augmentation de la mortalité pour Hb ≤ 12 g/dl



L'anémie pré-op est associée à de la morbi-mortalité



L'anémie pré-op est associée à la transfusion

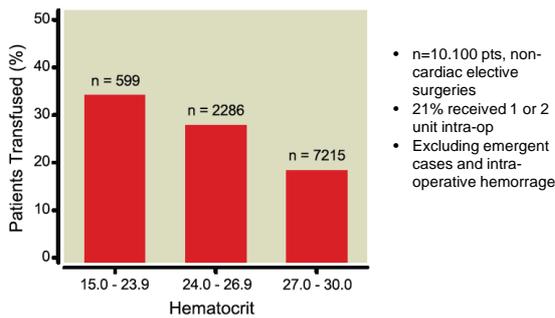
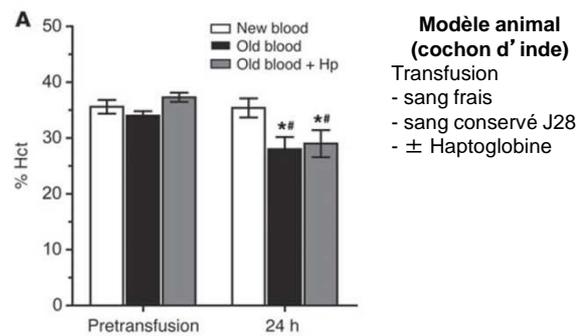


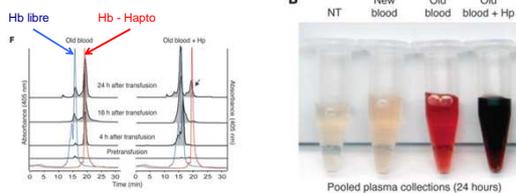
Fig. 1. Proportion of patients receiving one or two units of erythrocytes intraoperatively versus baseline hematocrit.

Glance *Anesthesiology* 2011

Effet de la transfusion



Toxicité de la transfusion



Lésions Aorte

Insuffisance Rénale



La transfusion est également un FDR de morbi-mortalité

n=10.000 chirurgies majeures non cardiaques
Transfusion 1-2 CG en dehors de l'hémorragie

Outcome	Transfusion Group, Outcome Rate (%)	No Transfusion Group, Outcome Rate (%)	Unadj OR Txf vs. No Txf (95% CI)	Adj OR Txf vs. No Txf (95% CI)	Adj OR Txf vs. No Txf (PS Method) (95% CI)
Mortality	6.64	4.26	1.56 (1.24, 1.96)	1.25 (1.09, 1.43)	1.21 (0.98, 1.49)
Major complications	2.18	1.80	1.24 (1.09, 1.42)	1.07 (0.97, 1.18)	1.07 (0.97, 1.18)
Renal complications	2.69	1.85	1.46 (1.08, 1.99)	1.32 (0.93, 1.88)	1.29 (0.91, 1.84)
CNS complications	0.69	0.58	1.20 (0.67, 2.15)	0.84 (0.43, 1.64)	0.68 (0.34, 1.36)
Sepsis complications	16.4	9.61	1.71 (1.56, 2.07)	1.43 (1.21, 1.68)	1.46 (1.24, 1.72)
Bleeding complications	3.17	4.85	0.67 (1.17, 2.34)	1.87 (1.47, 2.37)	1.80 (1.43, 2.31)
Thromboembolic complications	4.07	1.89	2.20 (1.69, 2.88)	1.77 (1.32, 2.38)	1.81 (1.34, 2.45)

Adj = adjusted; CI = confidence interval; CNS = central nervous system; OR = odds ratio; PS method = propensity score method; Txf = transfusion; Unadj = unadjusted.

Glance LG, et al. *Anesthesiology* 2011;114:283-92.

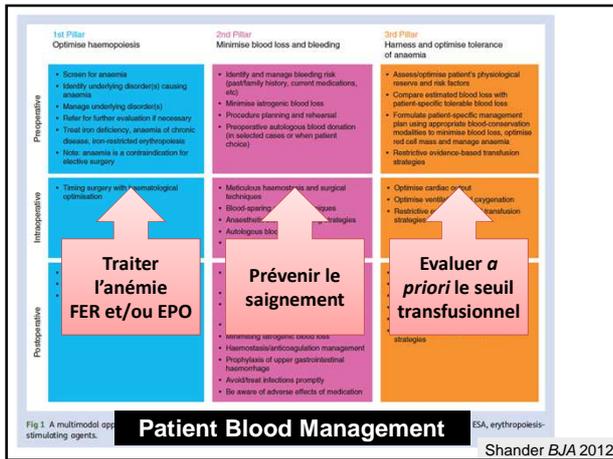
MESSAGE N° 1



L'anémie (Hb < 12-13) ET la transfusion sont fréquentes et délétères !

PBM

Patient Blood Management



Le pilier 1: EPO et Fer



Il existe des recommandations...

EJA

Eur J Anaesthesiol 2015; 34:202-209

GUIDELINES

Management of severe perioperative bleeding: guidelines from the European Society of Anaesthesiology

We recommend that patients at risk of bleeding are assessed for anaemia 2 to 8 weeks before surgery. **1C**

If anaemia is present, we recommend identifying the cause (iron deficiency, renal insufficiency or inflammation). **1C**

We recommend treating iron deficiency with iron supplementation. **1B**

We recommend the use of intravenous iron in preoperative anaemia. **1C**

If autologous blood donation is performed, we suggest treatment with iron and/or erythropoiesis-stimulating agents to avoid preoperative anaemia and increased overall transfusion rates. **2C**

We suggest that preoperative anaemia, we recommend the use of combined therapy with intravenous iron and erythropoiesis along with a restrictive transfusion policy. **1C**

Société Française d'Anesthésie et de Réanimation
Examens pré interventionnels systématiques

Lors d'une intervention à risque intermédiaire ou élevé, quel que soit l'âge, il est recommandé de prescrire un hémogramme avant l'acte pour son caractère pronostique ou d'aider à l'évaluation d'une stratégie transfusionnelle. **(GRADE 1-2)**

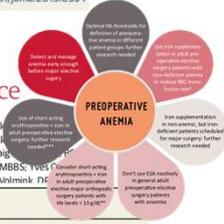


JAMA | Special Communication JAMA. 2019;321(10):983-997. doi:10.1001/jama.2019.0554

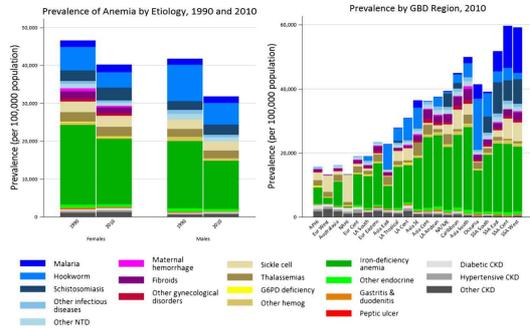
Patient Blood Management Recommendations From the 2018 Frankfurt Consensus Conference

Markus M. Mueller, MD, Hans Van Remoortel, PhD; Patrick Meybohm, MD, PhD; Kari Arant, Céline Aubron, MD, PhD; Reinhard Burger, PhD; Jeffrey L. Carson, MD, PhD; Klaus Cichutek, Emmy De Buck, PhD; Dana Devine, PhD; Dean Fergusson, PhD; Gilles Folini, MD, PhD; Craig Katherine P. Frey, MD; Richard Gammon, MD; Jerrold H. Levy, MD; Michael F. Murphy, MD, MBS; Yves Katerina Pavlenki, MD; Cynthia So-Chanson, MD, PhD; Pierre Theecharoen, MD, PhD; Jemmi Ulinmink, DE

- Clinical Recommendation**
- CR1—Detection and management of preoperative anemia early enough before major elective surgery
 - CR2—Use of iron supplementation to reduce red blood cell transfusion rate in adult preoperative patients with iron-deficient anemia undergoing elective surgery
 - CR3—Do not use erythropoiesis-stimulating agents routinely in general for adult preoperative patients with anemia undergoing elective surgery
 - CR4—Consider short-acting erythropoietins in addition to iron supplementation to reduce transfusion rates in adult preoperative patients with hemoglobin concentrations <13 g/dL undergoing elective major orthopedic surgery



La carence martiale reste la première cause d'anémie dans le monde !

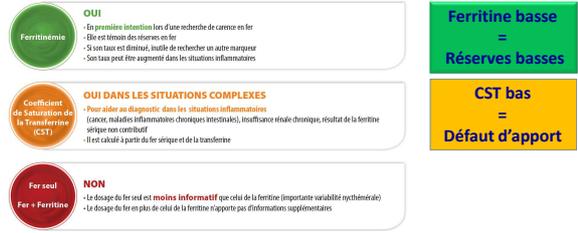


blood

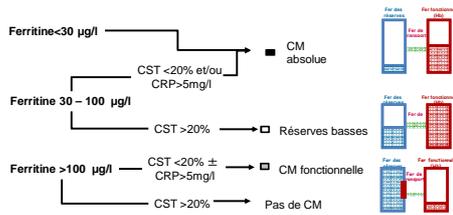
Kassebaum N Blood 2014

Recommandations pour le diagnostic de la carence martiale: HAS 2011

Prendre en compte le contexte clinique et réaliser préalablement l'hémogramme

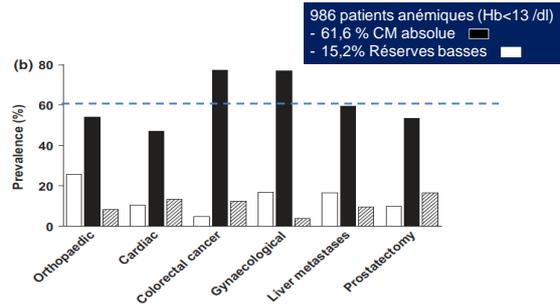


Diagnostic Carence Martiale



Munoz Anaesthesia 2017

Prévalence de l'anémie par CM



Munoz Anaesthesia 2017

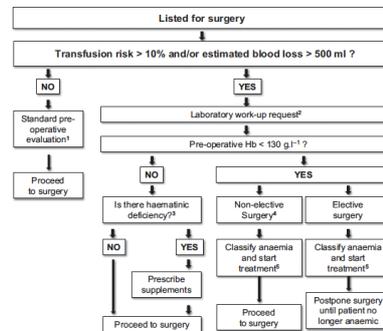
Anaesthesia 2017, 72, 233-247

doi:10.1111/anae.13773

Consensus Statement

International consensus statement on the peri-operative management of anaemia and iron deficiency

M. Muñoz,¹ A. G. Acheson,² M. Auerbach,³ M. Besser,⁴ O. Habler,⁵ H. Kehlet,⁶ G. M. Liumbruno,⁷ S. Lasocki,⁸ P. Meybohm,⁹ R. Rao Baikady,¹⁰ T. Richards,¹¹ A. Shander,¹² C. So-Soan,¹³ D. R. Spahn¹⁴ and A. A. Klein¹⁵



Chir à risque:
Il faut avoir un bilan pré-op et éventuellement décaler la chirurgie

Munoz Anaesthesia 2017

En pratique ?

Il est possible de faire une **ordonnance conditionnelle** :

- Prélèvements de 2 tubes
- Réalisation d'une NFS
- Bilan martial (*ferritine* + *Tsat*) si Hb <13 g/dL

Populations à risque:

- Insuffisants cardiaques,
- Végétariens, femmes jeunes
- Cancer (45%)
- Saignements chroniques...

IV ou per OS ?



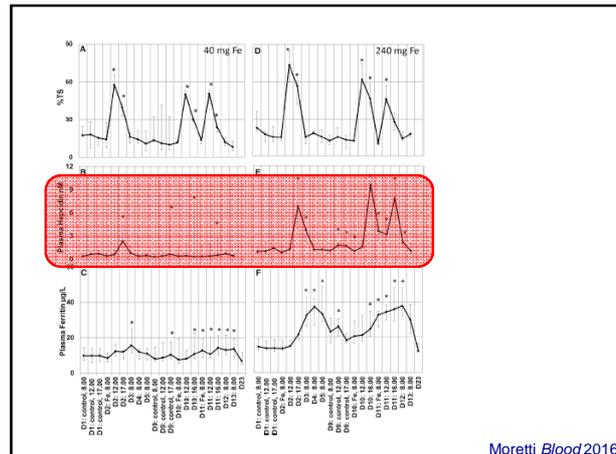
L'absorption du FER oral est limitée

Table 1. Iron absorption and iron status markers with increasing oral doses of FeSO₄ in young women (study 1)

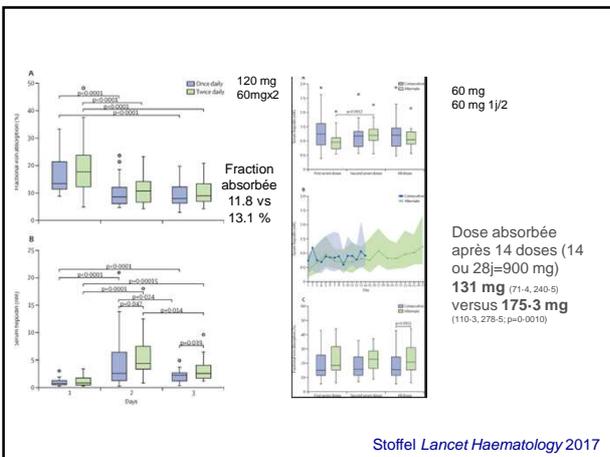
Fe dose (mg)	Iron bioavailability			Iron status				
	Fractional Fe absorption (%)	Fe absorbed (mg)	Phep (nM)	Plasma Fe (µg/mL)	Transferrin saturation (%)	PF (µg/L)	sTfR (mg/L)	Body iron stores (mg/kg BW)
40	1 NA	NA	0.30 (0.12-0.48)	0.83 (0.34)	20.9 (15.1)	10.0 (3.4-21.8)	8.2 (4.2)	-0.05 (3.7)
2	22.7 (14.7-37.1)	3.1 (0.9-22.8)	0.35 (0.11-0.77)	0.35 (0.35)	16.5 (11.7)	9.1 (4.9-25.4)	8.4 (3.8)	-0.8 (3.7)
9	19.4 (15.9-22.9)	7.8 (5.9-9.2)	0.59 (0.19-0.8)	0.67 (0.61)	21.5 (24.8)	10.5 (5.1-40.6)	7.1 (3.2)	0.11 (4.1)
10	16.7 (11.8-20.7)	8.7 (4.7-16.3)	0.45 (0.05-0.43)	0.60 (0.4)	18.6 (16.3)	15 (8.4-51.6)	7.8 (3.5)	1.2 (3.6)
23	NA	NA	ND	ND	ND	7.7 (4.2-20.1)	5.6 (1.9)	-0.84 (2.4)
80	1 NA	NA	0.93 (0.1-3.7)	1.2 (1.1)	29.8 (12.8)	19.4 (6.0-38.4)	4.8 (1.7)	3.5 (3.5)
2	19.0 (10.5-30.9)	14.2 (8.4-24.1)	0.90 (0.49-2.2)	0.83 (0.40)	21.5 (8.4)	17.7 (6.0-43.6)	4.8 (1.6)	3.5 (3.4)
9	18.2 (8.5-26.0)	14.8 (8.5-26.0)	1.1 (0.62-2.1)	0.75 (0.41)	20.9 (9.6)	17.7 (6.5-51.1)	4.5 (2.5)	3.6 (3.4)
10	11.7 (8.4-24.7)	8.3 (4.8-12.4)	2.1 (0.98-5.1)	0.96 (0.60)	23.5 (12.5)	33 (24.1-55.0)	3.9 (1.7)	5.3 (2.7)
23	NA	NA	ND	ND	ND	15.2 (7.2-68.3)	2.9 (1.5)	4.8 (3.7)

≈ 10 mg/jour

Moretti Blood 2016



Moretti Blood 2016

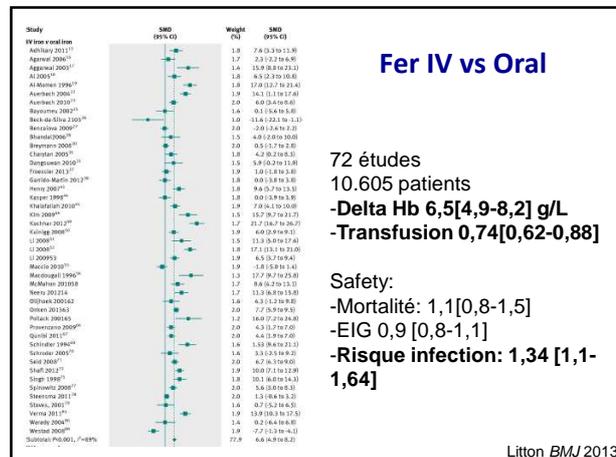


Stoffel Lancet Haematology 2017

Fer IV vs Oral

72 études
10.605 patients
-Delta Hb 6,5[4,9-8,2] g/L
-Transfusion 0,74[0,62-0,88]

Safety:
-Mortalité: 1,1[0,8-1,5]
-EIG 0,9 [0,8-1,1]
-Risque infection: 1,34 [1,1-1,64]



Litton BMJ 2013

Intérêt du FER IV en chirurgie colique

- 72 patients opérés de colectomie
 - Anémie = Hb < 12 F; Hb < 13 H
 - CM = ferritine < 300 et TSAT < 25%,
 - 4-21 j pre op (moyenne 8 jours)
- Traitement
 - CMF 15 mg/kg (max 1g)
 - Placebo
- Arret après 1^{ère} analyse intermédiaire

Froessler *Annals Surg* 2016

Impact of treating Iron Deficiency Anemia Before Major Abdominal Surgery

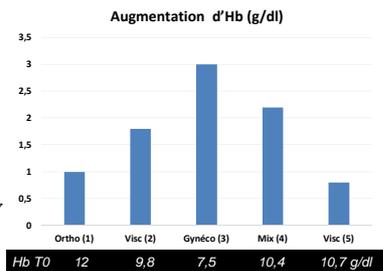


Froessler et al. *Ann Surg*. July 2016. **ANNALS OF SURGERY**

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Le fer IV est efficace en pré-opératoire

Traitement pré-op, de 4 à 21 jours
Doses entre 900 mg et 1,2g



- Theusinger *Anesthesiology* 2007
- Keeler *Colorectal Dis* 2014
- Kim *Acta Haematol* 2009
- Bisbe *BJA* 2011
- Froessler *Ann Surg* 2016

Dose de Fer

*P<0.05; **P<0.001, IS vs FCM. †There were differences between groups with respect to patient distribution by surgical procedure (P<0.001, IS vs FCM). ‡Final Hb—last Hb assessment before surgery. ††Hb increment—final Hb—baseline Hb. †††Response—Hb increment ≥1.5 g d⁻¹ or final Hb ≥13 g d⁻¹. ††††According to WHO definition: Hb ≥12 g d⁻¹ in women, and Hb ≥13 g d⁻¹ in men

	Iron sucrose				Ferric carboxymaltose			
	All	Colon cancer resection	Abdominal hysterectomy	Lower limb orthoplasty	All	Colon cancer resection	Abdominal hysterectomy	Lower limb orthoplasty
Patients (n) [†]	84	30	33	21	76	15	19	42
Gender (female/male)	59/25	8/22	33/0	17/4	66/10	5/10	19/0	37/5
Age (yr)	60 (32–88)	67 (36–83)	45 (32–55)	72 (53–88)	62 (36–87)	65 (36–87)	48 (36–75)	68 (46–82)
Weight (kg)	72 (12)	74 (9)	68 (16)	76 (7)	71 (14)	68 (14)	62 (10)	75 (14)
Ferritin (ng ml ⁻¹)	18 (20)	15 (10)	12 (14)	33 (31)	21 (21)	16 (19)	20 (19)	23 (22)
C-reactive protein (mg dl ⁻¹)	1.0 (1.3)	1.5 (1.2)	0.5 (0.6)	1.5 (1.6)	0.8 (1.4)	1.1 (1.4)	0.3 (0.3)	1.0 (1.7)
Total iron deficiency (mg)	1000 (220)	1025 (240)	1050 (210)	920 (190)	950 (310)	1125 (230)	935 (210)	900 (350)
Total Lv. iron dose (mg)	1010 (440)	1140 (570)	1000 (350)	830 (270)	1120 (530)	1550 (650) ^{††}	1030 (330)	1000 (490)
Sessions (n)	5 (2)	6 (3)	5 (2)	4 (4)	2 (1) ^{†††}	3 (1) ^{†††}	2 (1) ^{†††}	2 (1) ^{†††}
Baseline Hb (g dl ⁻¹)	10.3 (1.3)	10.1 (1.2)	9.7 (1.2)	10.7 (1.1)	10.4 (1.6)	9.2 (1.0) ^{†††}	10.6 (1.3)	10.9 (1.7)
Final Hb (g dl ⁻¹) ^{††††}	12.1 (1.4)	11.0 (1.4)	12.7 (0.8)	12.6 (1.0)	12.5 (1.0) ^{††††}	11.7 (0.8) ^{††††}	12.4 (1.2)	12.8 (0.9)
Hb increment (g dl ⁻¹)	1.8 (1.1)	0.9 (1.3)	3.0 (0.6)	1.9 (1.0)	2.1 (1.4)	2.5 (1.0)	1.8 (1.3)	1.9 (1.0)
Response (n) (%)	20 (24)	12 (40)	2 (6)	6 (29)	7 (9)	1 (7)	0 (0)	6 (14)
Adverse events (n (%))	6 (7)	0 (0)	5 (15)	1 (5)	4 (5)	1 (7)	1 (5)	3 (7)
Iron treatment costs (€)	117 (51)	190 (83)	190 (83)	21 (10)	224 (106)	21 (10)	21 (10)	21 (10)
Acquisition costs	117 (51)	190 (83)	190 (83)	21 (10)	224 (106)	21 (10)	21 (10)	21 (10)
Administration costs	190 (83)	190 (83)	190 (83)	21 (10)	224 (106)	21 (10)	21 (10)	21 (10)
Total costs	307 (133)	380 (166)	380 (166)	42 (20)	448 (212)	42 (20)	42 (20)	42 (20)

Bisbe *BJA* 2011

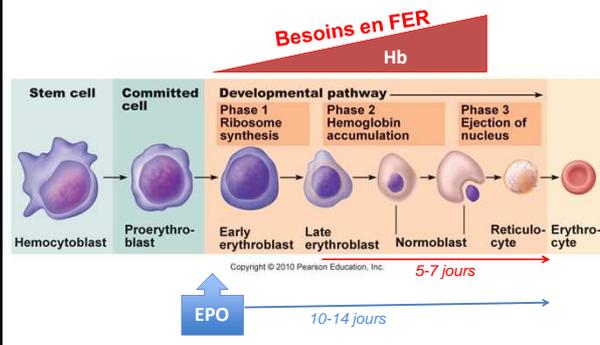
Dose = 1500 mg !

TABLE 3: Average calculated iron deficit dose in clinical Studies 1–5.

Study	Patient population	Calculated mean iron deficit based on the modified Ganzoni formula* (mg)	Standard deviation	Number of patients
(1) van Wyck et al., 2007 [38]	Postpartum	1458	330	182
(2) van Wyck et al., 2009 [39]	Heavy uterine bleeding	1608	383	251
(3) Seid et al., 2008 [40]	Postpartum	1539	351	143
(4) Barish et al., 2012 [41]	IDA various etiologies	1520	342	348
(5) Hussain et al., 2013 [42]	IDA various etiologies	1508**	359	161
Overall mean		1531	NC	1085

Koch *Anemia* 2015

Erythropoïèse normale

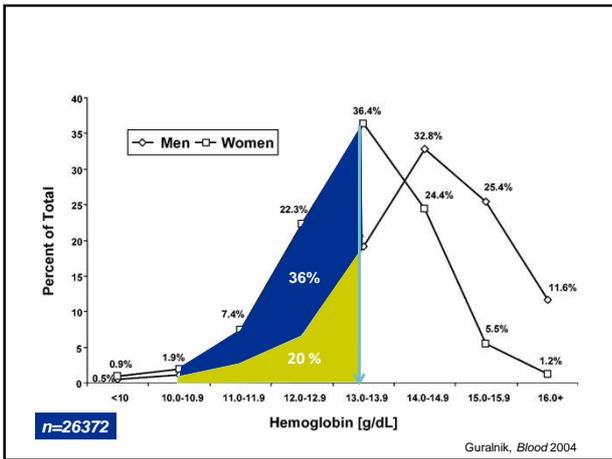




HAS HAUTE AUTORITÉ DE SANTÉ | ansm Agence nationale de sécurité du médicament et des produits de santé

A L'utilisation de l'EPO est recommandée en préopératoire de la chirurgie orthopédique hémorragique chez les patients modérément anémiques. L'utilisation devra être réservée aux patients ayant une anémie modérée (par exemple Hb : 10 à 13 g/dl), et chez lesquels on s'attend à des pertes de sang modérées (900 à 1 800 ml).

B L'utilisation d'EPO dans le cadre péri-opératoire de la chirurgie colorectale carcinologique n'est pas recommandée, en raison de l'insuffisance de données sur la preuve de son efficacité.

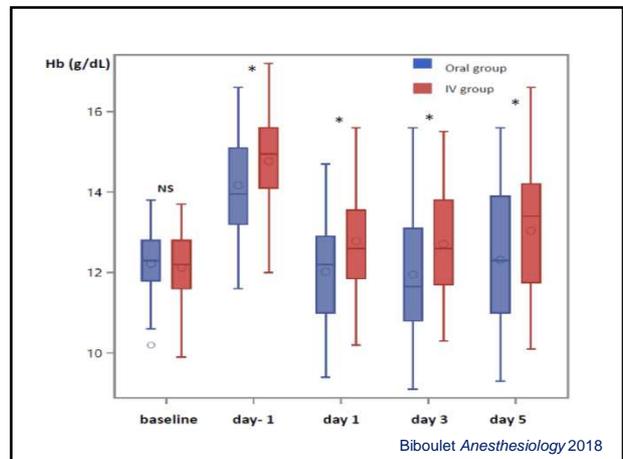
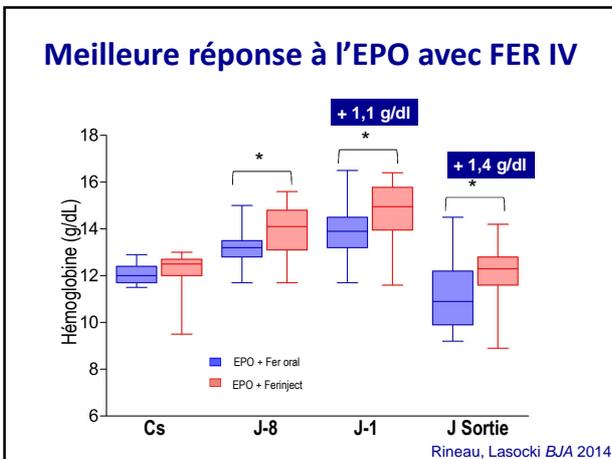


EPO Pre-opératoire: métaanalyse en orthopédie

Study	n	Events	RR	95% CI			
1.3.2 ESA Alone							
Canadian group 1993	53	130	44	78	8.0%	0.72	[0.54, 0.96]
Deutsch 2006	7	25	2	25	1.9%	3.50	[0.80, 15.23]
Faris 1996	25	118	36	67	7.0%	0.39	[0.26, 0.60]
Feagan 2000	23	123	35	78	6.7%	0.42	[0.27, 0.65]
Keating 2007	4	130	17	121	2.9%	0.22	[0.08, 0.63]
Na 2011	11	54	29	54	5.6%	0.38	[0.21, 0.68]
Rosencher 2005	3	45	6	41	2.1%	0.46	[0.12, 1.70]
Weber 2005	42	460	87	335	7.6%	0.25	[0.18, 0.34]
Subtotal (95% CI)	1085	699	41.8%	0.44	0.29	[0.29, 0.67]	
Total events	188	256					
Heterogeneity: Tau ² = 0.24; Chi ² = 33.81, df = 7 (P < 0.0001); I ² = 79%							
Test for overall effect: Z = 3.85 (P = 0.0001)							
Total (95% CI)	2059	1391	100.0%	0.48	0.38	[0.38, 0.60]	
Total events	307	445					
Heterogeneity: Tau ² = 0.14; Chi ² = 52.83, df = 23 (P = 0.0004); I ² = 56%							
Test for overall effect: Z = 6.57 (P < 0.00001)							
Test for subgroup differences: Chi ² = 0.61, df = 1 (P = 0.44), I ² = 0%							

RR de transfusion = 0,44
(15 vs 37% de patients transfusés)

Alsaleh J Arthroplasty 2013



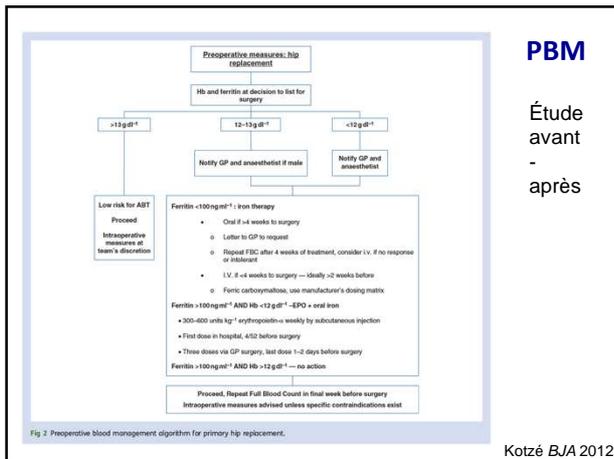


Table 6 Before-and-after comparisons. Continuous data expressed as median (IQR). *P=0.02; *P<0.01; **P<0.001

	Before	After
Female:male ratio	412:305	155:126
TKR:THR ratio	356:361	123:158
ASA score	2 (2-2)	2 (2-3)
Age (yr)	72 (65-78)	74* (66-80)
Anaemia prevalence at decision for surgery	166/684	73/281
Nadir Hb in transfused patients (g dl ⁻¹)	7.8 (7.2-8.7)	7.6 (7.3-9.2)
Discharge Hb (g dl ⁻¹)	10.4 (9.5-11.4)	10.4 (9.4-11.0)
Hb loss: THR (g dl ⁻¹)	3.8 (2.9-4.9)	3.1** (1.9-4.6)
Hb loss: TKR (g dl ⁻¹)	3.1 (1.9-4.6)	2.6* (2.0-3.3)
Received ABT: THR	83/361	12**/158
Received ABT: TKR	24/356	0**/123
Length of stay (days): THR	6 (5-8)	5** (3-7)
Length of stay (days): TKR	6 (5-8)	4** (3-6)
Readmitted within 30 days	49/717	12/281
Readmitted within 90 days	97/717	23/281

↓ Transfusion

- PTH: 23 → 7%
- PTC: 7 → 0%

Kotzé BJA 2012

MESSAGE N° 2

L'anémie (Hb < 12-13) ET la transfusion sont délétères !

La Carence Martiale est fréquente en PRE-OP FER IV si Ferritine <100 ou si EPO

- Patients à risque: « cardiaques », femmes jeunes, végétariens, IPP, Aspirine...

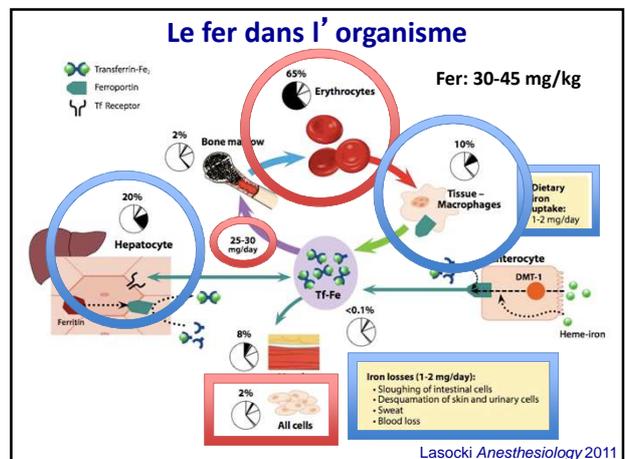
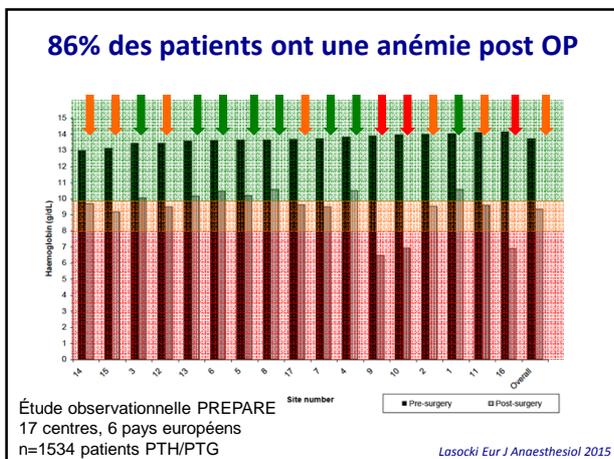
Et en post-opératoire ...

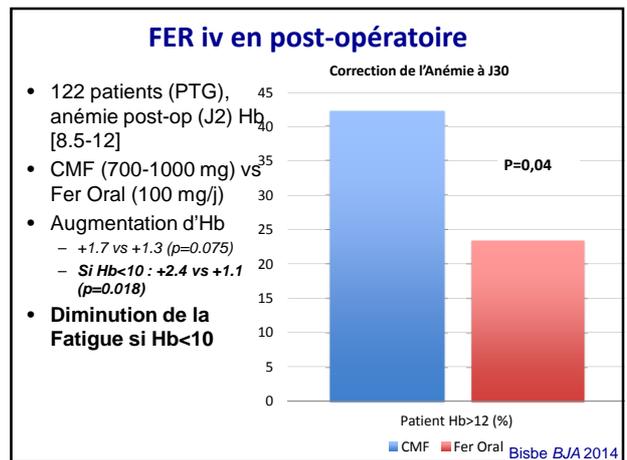
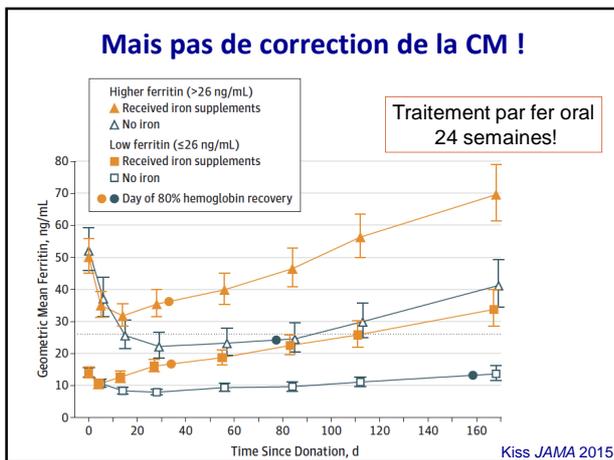
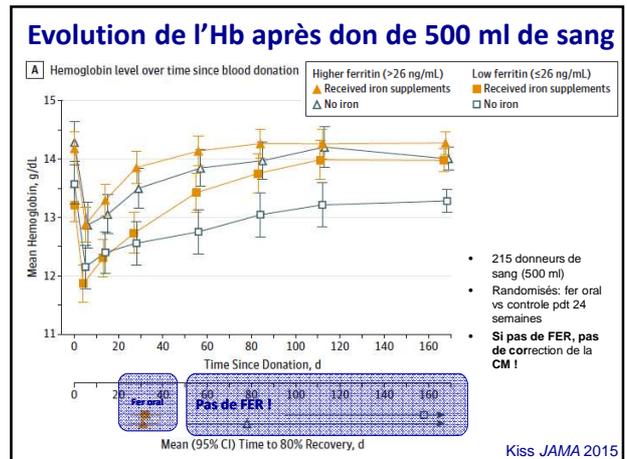
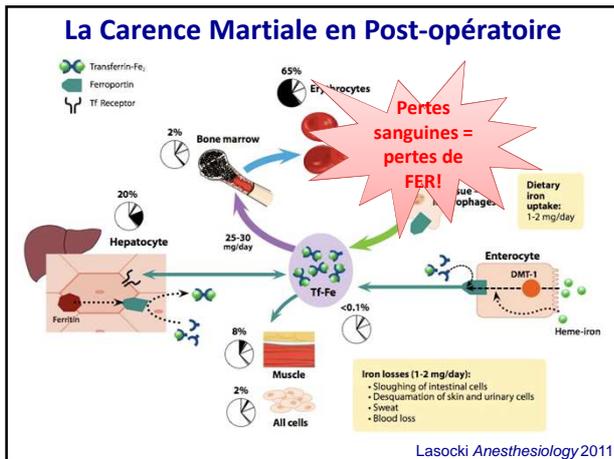
PRE-op

Chirurgie

POST-op

La chirurgie? Pas de problème!





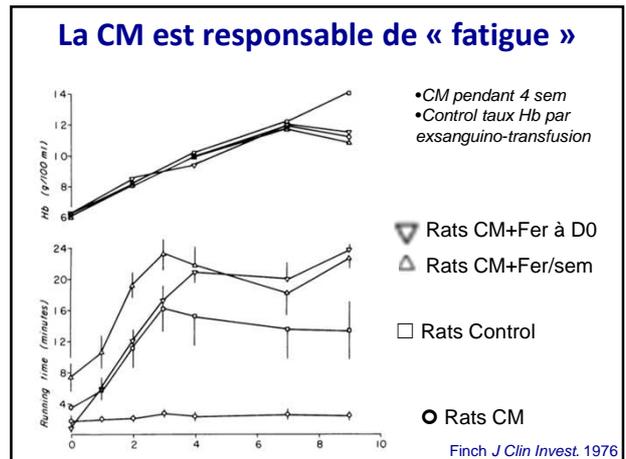
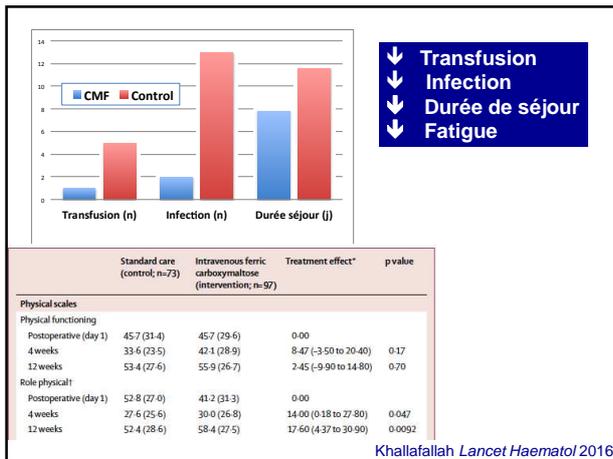
Fer IV post-opératoire

- Etude randomisée, ouverte, bi-centrique
- J1 post op (ortho++, Visc, Uro, gyneco)
 - Chirurgie réglée
 - Séjour ≥ 2 nuits
 - Hb [7 - 12 g/dl]
 - CM= Ferritine<100 ou TSAT<20%
- Randomisation CMF 1g vs standard of care

Khallafallah *Lancet Haematol* 2016

	Standard care (control; n=98)	Intravenous ferric carboxymaltose (intervention; n=103)	Treatment effect*	p value
Haemoglobin (g/L)				
Preoperative	134.40 (13.10)	134.50 (11.10)	-0.61 (-4.31 to 3.09)	0.094
Postoperative (day 1)	105.50 (13.80)	106.20 (11.90)	0.00	
4 weeks	121.50 (14.50)	130.10 (11.80)	7.64 (3.79 to 11.9)	<0.0001
12 weeks	133.60 (11.30)	137.50 (11.10)	3.07 (-0.99 to 7.14)	0.24
Iron saturation (%)				
Preoperative	22.60 (6.70)	22.30 (4.70)	0.01 (-2.82 to 2.83)	0.82
Postoperative (day 1)	12.00 (5.60)	11.70 (6.60)	0.00	
4 weeks	18.70 (10.70)	20.90 (11.70)	1.40 (0.33 to 2.45)	<0.0001
12 weeks	25.30 (11.10)	31.70 (6.10)	6.52 (2.28 to 10.60)	0.0026
Serum ferritin (µg/L)				
Preoperative	188.00 (103.00)	118.00 (185.00)	-45.20 (-148.00 to 57.50)	0.18
Postoperative (day 1)	329.00 (335.00)	304.00 (423.00)	0.00	
4 weeks	278.00 (296.00)	717.00 (410.00)	468.00 (355.00 to 582.00)	<0.0001
12 weeks	198.00 (231.00)	481.00 (611.00)	309.00 (153.00 to 465.00)	0.0026

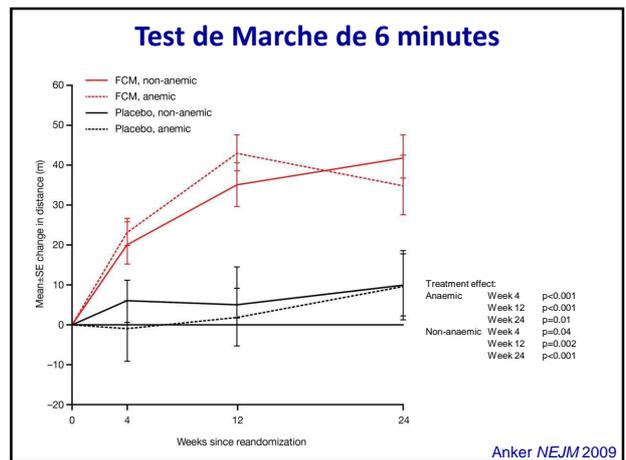
Khallafallah *Lancet Haematol* 2016



Intérêt du fer iv sur « la fatigue »

- **Étude multicentrique, 459 patients IC**
 - NYHA II et FEVG ≤ 40% ou NYHA III et FEVG <45%
 - Hb 9,5 – 13,5
- **Diagnostic CM**
 - Ferritine <100 µg/l ou
 - Ferritine 100-300 µg/l et TfSat<20%
- **TTT Ferric carboxy maltose ou placebo**
 - 200 mg/sem jusqu' à dose totale calculée
 - Randomisation 2/1

Anker NEJM 2009



En post-opératoire

- **Perte d'Hb = Perte de FER**
 - Pas de nécessité de faire un bilan
 - Ferritine = protéine inflammation, ne représente plus les réserves en FER
- **Transfusion**
 - Seuil 7-8 g/dl si comorbidité ++
 - Apporte du fer "dans les GR", mais ne traite pas la CM "cellulaire"

MESSAGE N° 3

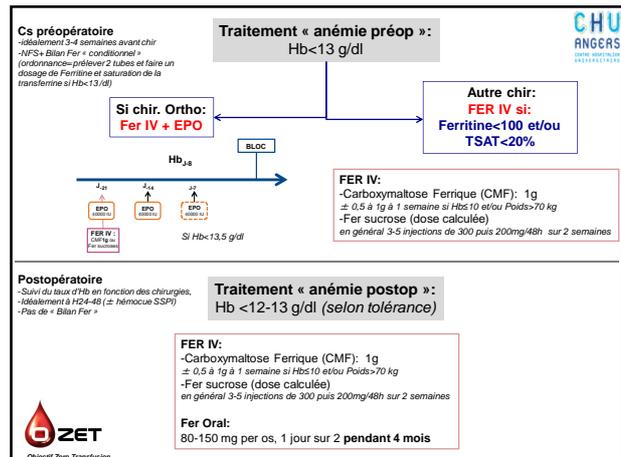
L'anémie (Hb < 12-13) ET la transfusion sont délétères !

En PRE-OP La Carence Martiale est fréquente
 FER IV si Ferritine <100 ou EPO

En post-op: FER IV si nécessité de corriger l'anémie « vite »
 500 mg pour 1-2 g/dl
 Amélioration récupération?

Messages

- Il faut traiter l'anémie périopératoire
- Intérêt du FER et de l'EPO
 - Ferritine < 100 µg/l
 - Dose 1g
 - Toujours FER avec EPO
- Saignement = perte de FER
 - Intérêt du fer en post-op



Merci



Objectif ZERO transfusion