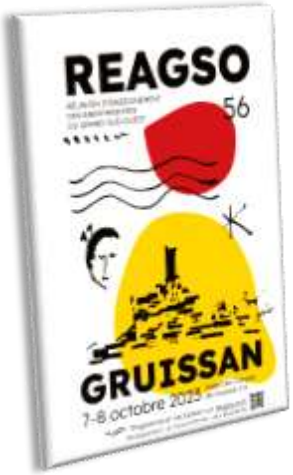


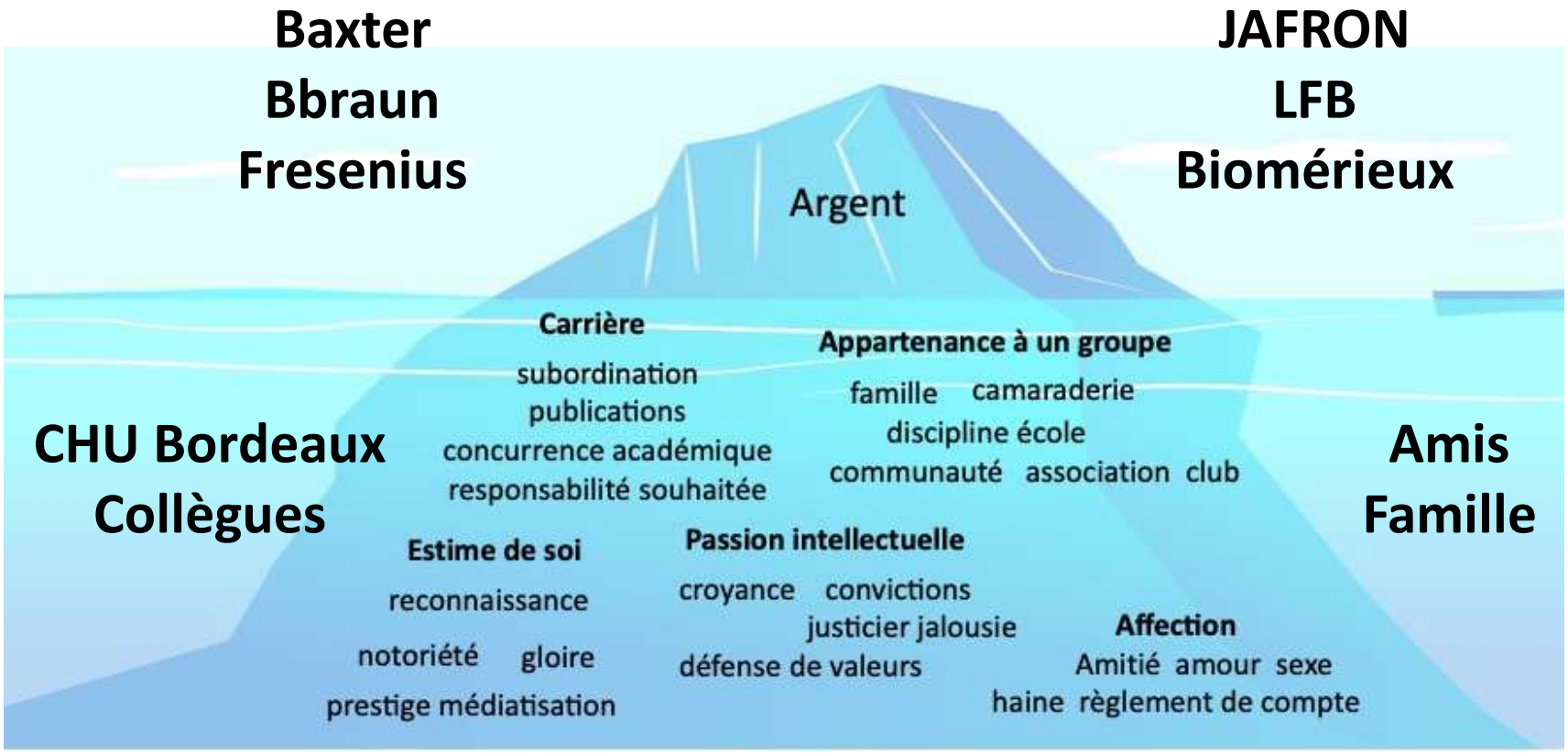
AKI en periopératoire

Pr O. JOANNES-BOYAU

CHU Bordeaux

Olivier.joannes-boyau@chu-bordeaux.fr

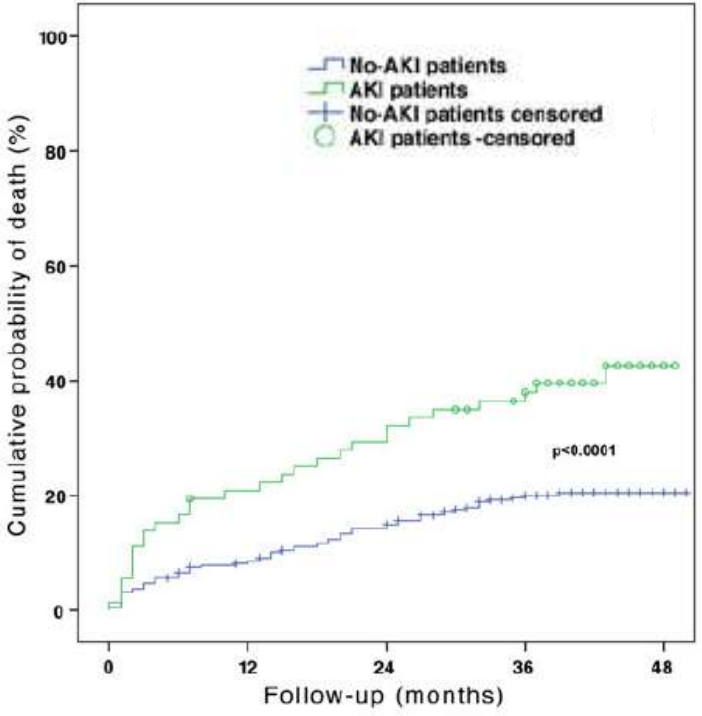
Liens d'intérêts



Acute kidney injury, long-term renal function and mortality in patients undergoing major abdominal surgery: a cohort analysis

Joana Gameiro[1,*], Joana Briosa Neves[1,*], Natacha Rodrigues[1], Catarina Bekerman[1], Maria João Melo[1], Marta Pereira[1], Catarina Teixeira[1], Inês Mendes[1], Sofia Jorge[1], Rosário Rosa[2], and José António Lopes[1]

2016,

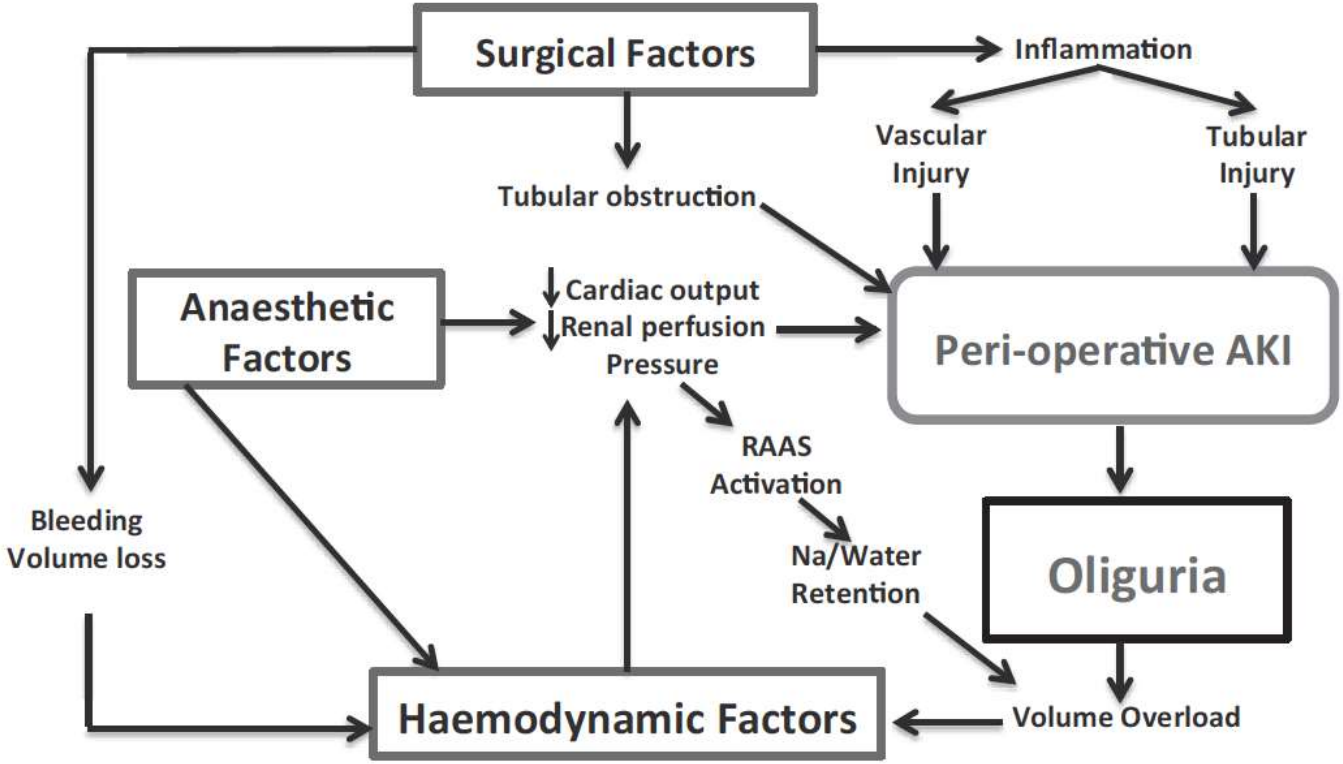


Number at risk					
	AKI patients	55	48	38	1
	No-AKI patients	287	262	197	11

Renal complications of anaesthesia

2018

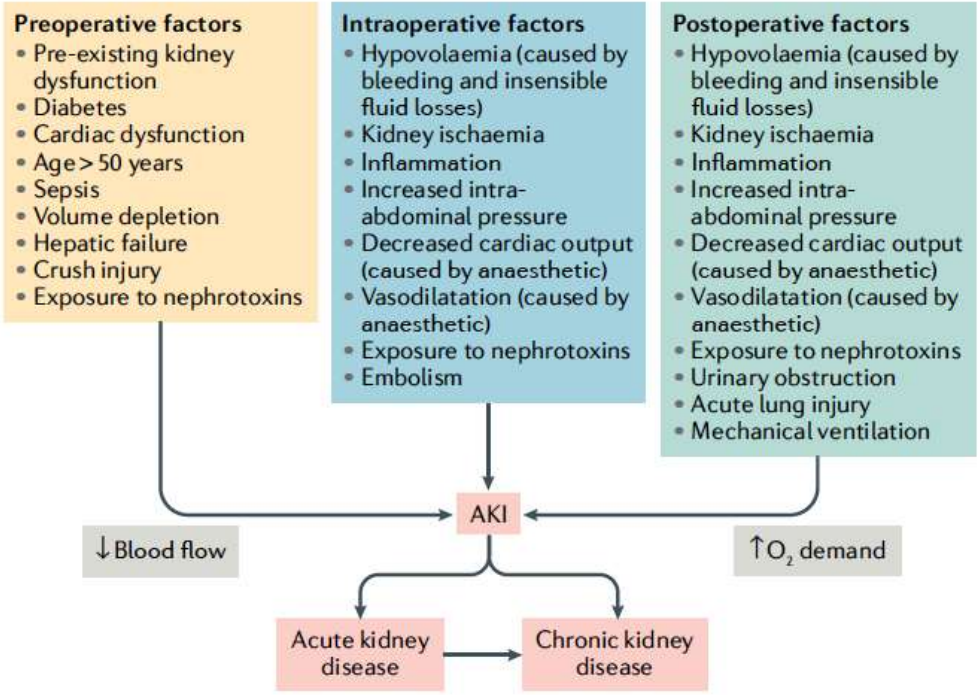
J. McKinlay,[1] E. Tyson[2] and L. G. Forni[1,3]



Postoperative acute kidney injury in adult non-cardiac surgery: joint consensus report of the Acute Disease Quality Initiative and PeriOperative Quality Initiative

2021

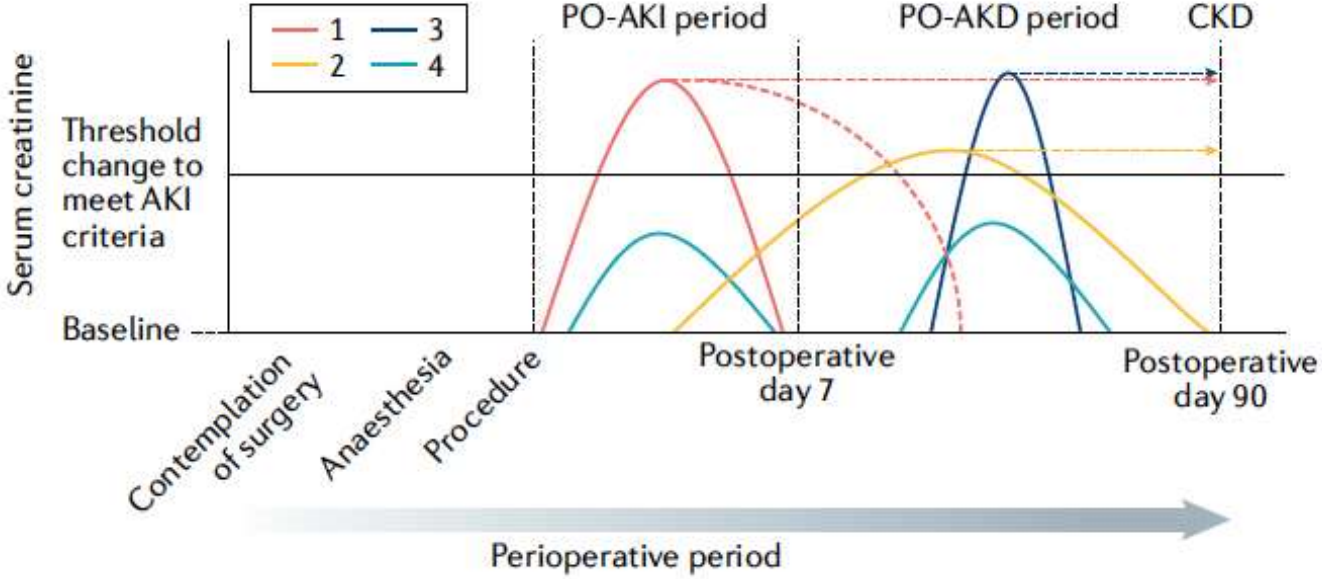
John R. Prowle[1✉], Luiz G. Forni[2,3], Max Bell[4], Michelle S. Chew[5], Mark Edwards[6], Morgan E. Grams[7], Michael P. W. Grocott[8], Kathleen D. Liu[9], David McIlroy[10], Patrick T. Murray[11], Marlies Ostermann[12], Alexander Zarbock[13], Sean M. Bagshaw[14],

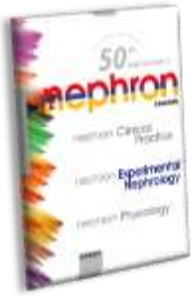


Postoperative acute kidney injury in adult non-cardiac surgery: joint consensus report of the Acute Disease Quality Initiative and PeriOperative Quality Initiative

2021

John R. Prowle[1✉], Lui G. Forni[2,3], Max Bell[4], Michelle S. Chew[5], Mark Edwards[6], Morgan E. Grams[7], Michael P. W. Grocott[8], Kathleen D. Liu[9], David McIlroy[10], Patrick T. Murray[11], Marlies Ostermann[12], Alexander Zarbock[13], Sean M. Bagshaw[14],

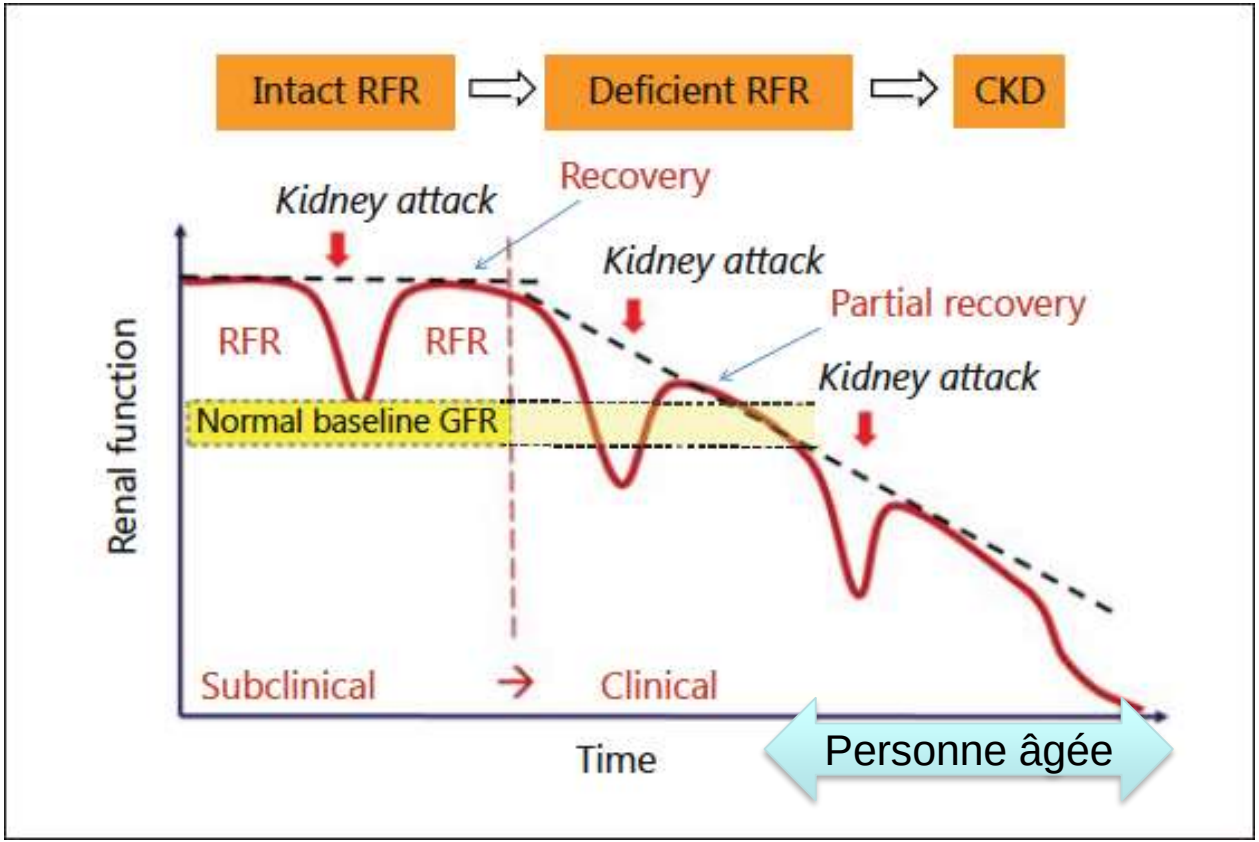




Renal Functional Reserve and Renal Recovery after Acute Kidney Injury

2014;

Aashish Sharma[a, c] Maria Jimena Mucino[a, d] Claudio Ronco[a, b]



Postoperative acute kidney injury in adult non-cardiac surgery: joint consensus report of the Acute Disease Quality Initiative and PeriOperative Quality Initiative

2021

John R. Prowle[1✉], Lui G. Forni[2,3], Max Bell[4], Michelle S. Chew[5], Mark Edwards[6], Morgan E. Grams[7], Michael P. W. Grocott[8], Kathleen D. Liu[9], David McIlroy[10], Patrick T. Murray[11], Marlies Ostermann[12], Alexander Zarbock[13], Sean M. Bagshaw[14],

Table 1 | **Adaptation of the KDIGO guidelines for treatment of AKI to the postoperative setting**

ADQI–POQI recommendations[a]	KDIGO strength of recommendation	KDIGO grade of evidence
In the absence of haemorrhagic shock, we suggest using a balanced and buffered isotonic crystalloid (e.g. Ringer's lactate) rather than colloids (albumin or starches) as initial management for expansion of intravascular volume in patients with PO-AKI	Strong	B
We recommend the use of vasopressors in conjunction with fluids in patients with vasomotor shock with PO-AKI	Strong	D
We suggest using protocol-based management of haemodynamic and oxygenation parameters to treat patients with PO-AKI and to prevent worsening of AKI in high-risk patients in the perioperative setting	Strong	D
We suggest insulin therapy targeting plasma glucose <180 mg/dl (10 mmol) in patients with PO-AKI	Weak	Not graded
We suggest not using diuretics to treat AKI, except in the management of volume overload	Strong	A
We recommend not using low-dose dopamine fenoldopam, atrial natriuretic peptide or recombinant human IGF1 to treat AKI	Strong	A
We recommend not using nephrotoxic drugs in patients with PO-AKI unless no suitable, less nephrotoxic alternatives are available or the benefits outweigh the risks	Strong	A

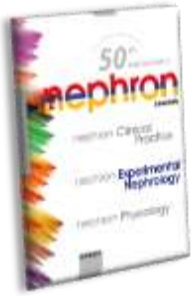
Acute kidney injury in the perioperative period and in intensive care units (excluding renal replacement therapies)

(2016)

Carole Ichai[1*], Christophe Vinsonneau[2*], Bertrand Souweine[3], Fabien Armando[4], Emmanuel Canet[5], Christophe Clec'h[6], Jean-Michel Constantin[7], Michaël Darmon[8], Jacques Duranteau[9], Théophille Gaillot[10], Arnaud Garnier[11], Laurent Jacob[12], Olivier Joannes-Boyau[13], Laurent Juillard[14], Didier Journois[15],

R 1-3: Il faut utiliser la classification KDIGO pour caractériser la gravité d'une IRA, selon le tableau suivant

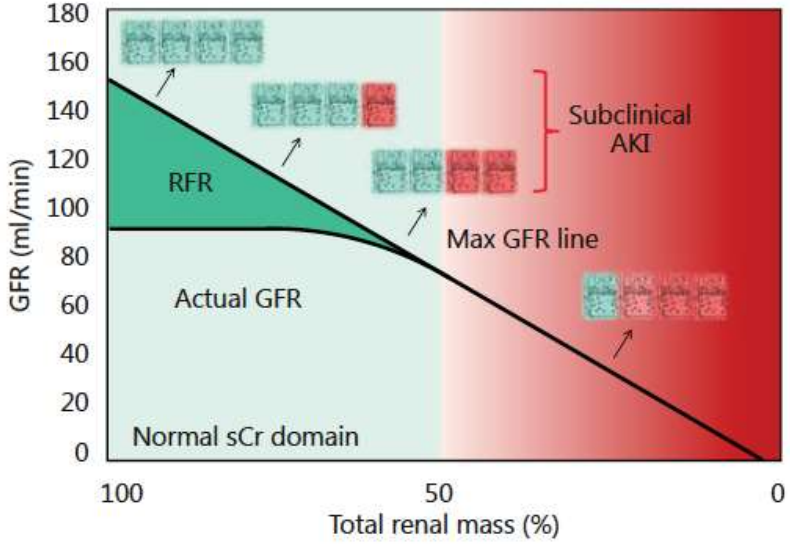
Stage	Serum Creatinine	Urine Output
1	1.5-1.9 times baseline OR ≥0.3 mg/dl (≥ 26.5 µmol/l) increase	<0.5 ml/kg/h for 6-12 hours
2	2.0-2.9 times baseline	<0.5 ml/kg/h for ≥12 hours
3	3.0 times baseline **OR increase in serum creatinine to ≥4.0 mg/dl (≥353.6 µmol/l) OR initiation of renal replacement therapy OR**, in patients <18 years, decrease in eGFR to <35 ml/min per 1.73 m^2	<0.3 ml/kg/h for ≥ 24 hours OR Anuria for ≥ 12 hours

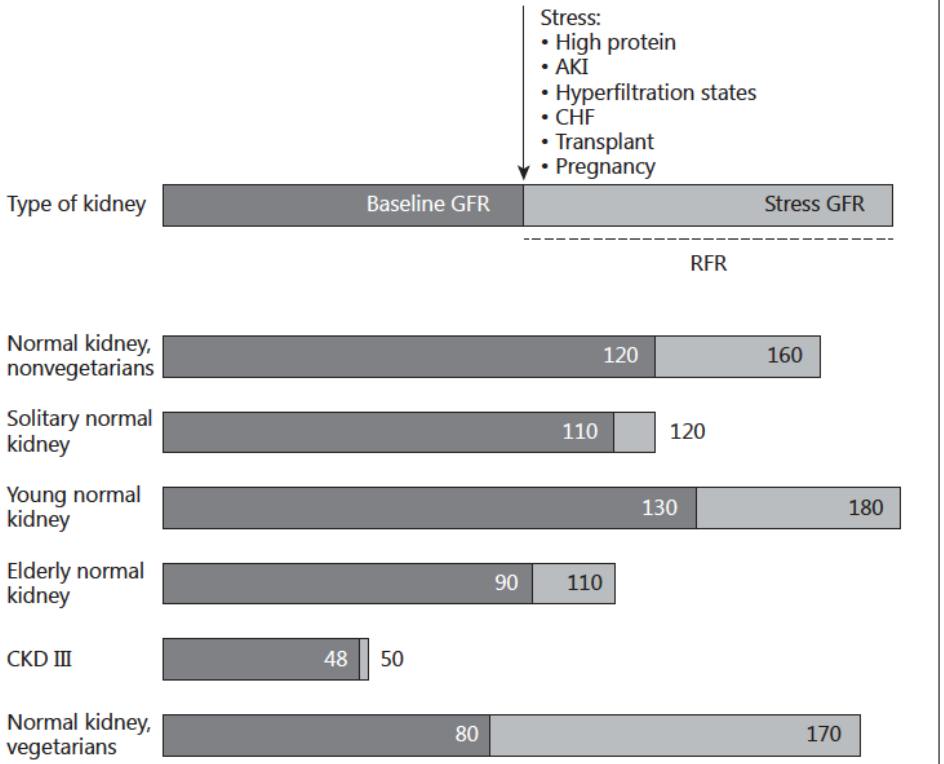


Renal Functional Reserve and Renal Recovery after Acute Kidney Injury

2014

Aashish Sharma[a, c] Maria Jimena Mucino[a, d] Claudio Ronco[a, b]





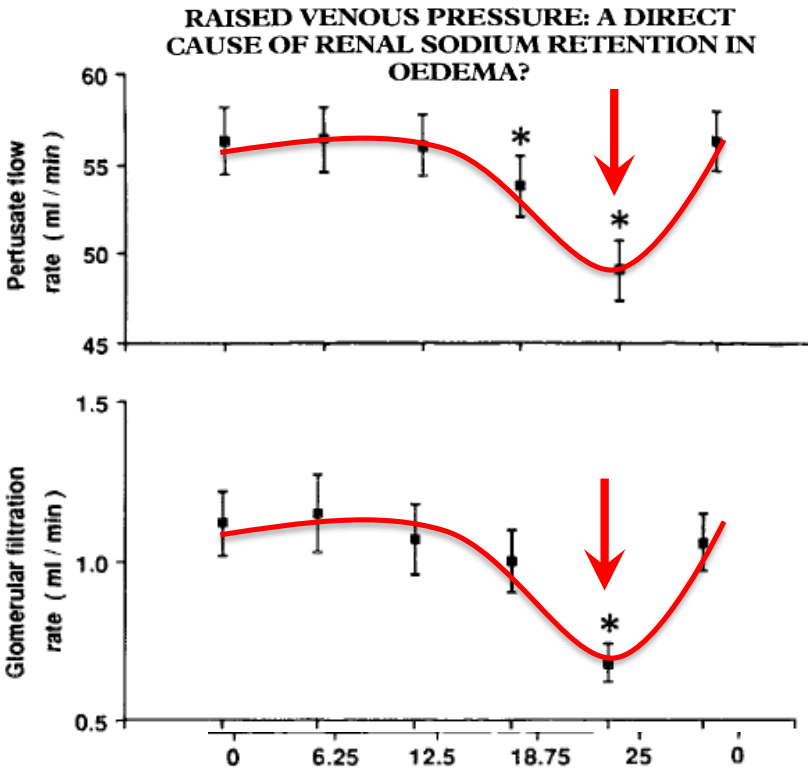
Remplissage: Deux questions en une

Combien ?

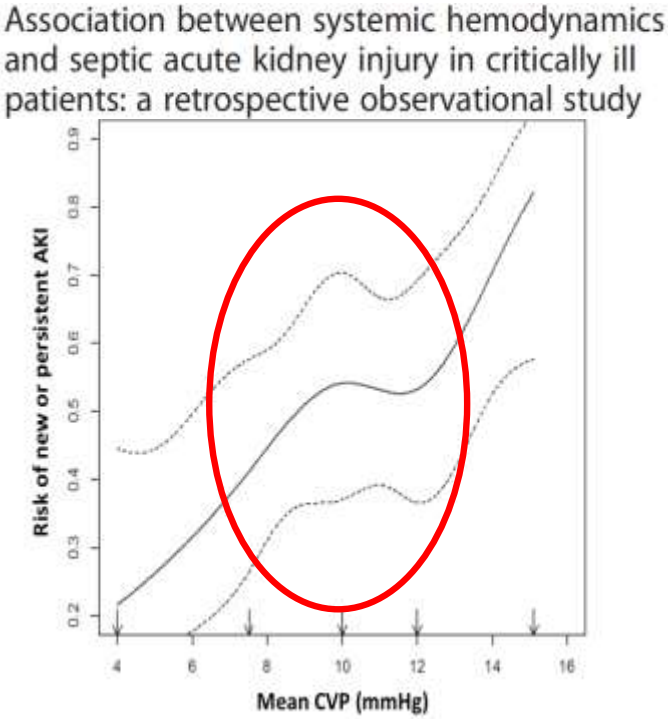
Quel soluté ?

La congestion

Augmentation PVC = réduction DSR & DFG



Firth JD et al Lancet 1998;331:1033-6

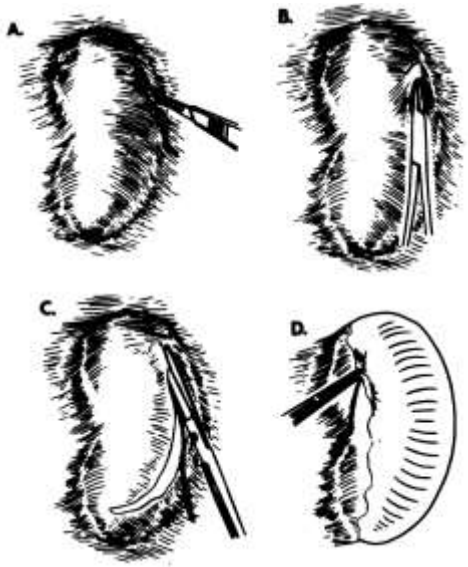


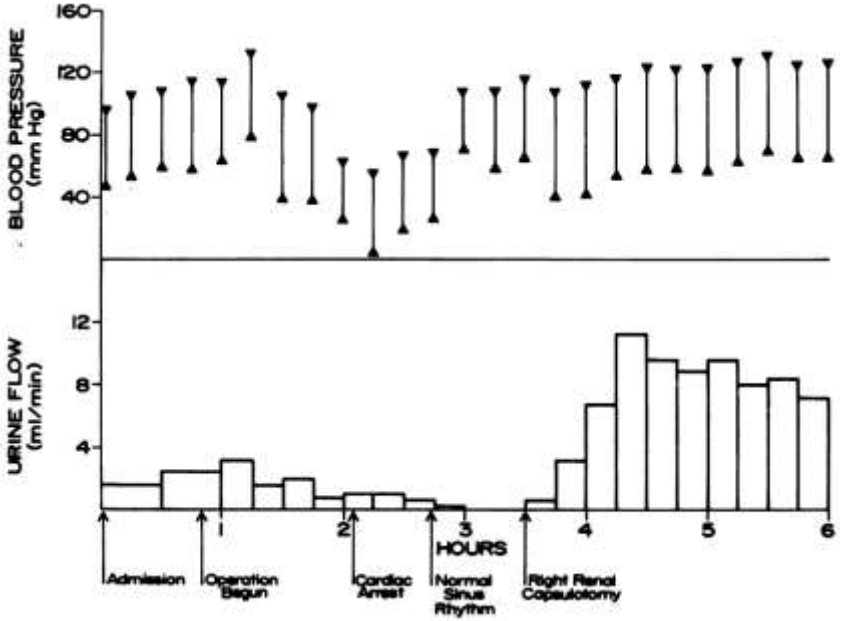
Legrand M et al Crit Care 2013;17:R278

Renal Decapsulation in the Prevention of Post-ischemic Oliguria

H. HARLAN STONE, M.D.,* J. TIMOTHY FULENWIDER, M.D.

1977





Restrictive versus Liberal Fluid Therapy for Major Abdominal Surgery

2018

P.S. Myles, R. Bellomo, T. Corcoran, A. Forbes, P. Peyton, D. Story, C. Christophi, K. Leslie, S. McGuinness, R. Parke, J. Serpell, M.T.V. Chan, T. Painter, S. McCluskey, G. Minto, and S. Wallace, for the Australian and New Zealand College of Anaesthetists Clinical Trials Network and the Australian and New Zealand Intensive Care Society Clinical Trials Group*

Table 1. (Continued.)

Characteristic	Restrictive Fluid (N=1490)	Liberal Fluid (N=1493)	
Median duration of surgery (IQR) — hr	3.3 (2.4–4.6)	3.3 (2.5–4.5)	
Planned postoperative care in HDU or ICU — no. (%)	416 (27.9)	418 (28.0)	
During surgery			
Median intraoperative blood loss (IQR) — ml	200 (100 to 400)	200 (100 to 500)	0.14†
Median intraoperative fluid administration (IQR) — ml			
Crystalloid	1677 (1173 to 2294)	3000 (2100 to 3850)	<0.001
Colloid‡	500 (250 to 800)	500 (400 to 1000)	0.01
Median infusion rate (IQR) — ml/kg/hr	6.5 (5.1 to 8.4)	10.9 (8.7 to 13.5)	<0.001
At 24 hr after surgery			
Median cumulative total for intravenous fluids (IQR) — ml	3671 (2885 to 4880)	6146 (5000 to 7410)	<0.001
Median fluid balance (IQR) — ml¶	1380 (540 to 2338)	3092 (2010 to 4241)	<0.001†
Median weight gain (IQR) — kg‖	0.3 (–1.0 to 1.9)	1.6 (0.0 to 3.6)	ND

Restrictive versus Liberal Fluid Therapy for Major Abdominal Surgery

2018

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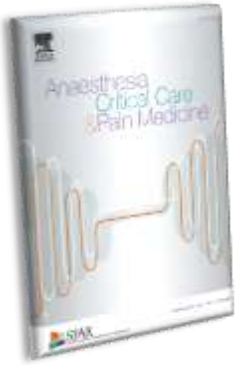
Table 3. Primary and Secondary Outcomes.*

Outcome	Restrictive Fluid (N = 1490)	Liberal Fluid (N = 1493)	Hazard or Risk Ratio (95% CI)†	P Value
Primary outcome				
Disability-free survival at 1 yr — no. (%)‡	1223 (81.9)	1232 (82.3)	1.05 (0.88–1.24)	0.61
Surgical-site infection — no./total no. (%)	245/1481 (16.5)	202/1487 (13.6)	1.22 (1.03–1.45)	0.02‖
Sepsis — no./total no. (%)	157/1481 (10.6)	129/1487 (8.7)	1.22 (0.98–1.52)	0.08
Anastomotic leak — no./total no. (%)	49/1481 (3.3)	35/1487 (2.4)	1.41 (0.92–2.16)	0.12
Pneumonia — no./total no. (%)	54/1481 (3.6)	57/1487 (3.8)	0.95 (0.66–1.37)	0.79
Acute kidney injury — no./total no. (%)**	124/1443 (8.6)	72/1439 (5.0)	1.71 (1.29–2.27)	<0.001
Renal-replacement therapy — no./total no. (%)	13/1460 (0.9)	4/1462 (0.3)	3.27 (1.01–13.8)	0.048‖
Median duration of mechanical ventilation (IQR) — hr§§	17 (5–65)	14 (3–31)	NA	0.07
Death — no. (%)‡				
At 90 days	31 (2.1)	18 (1.2)	1.73 (0.97–3.10)	0.06
At 12 mo	95 (6.5)	96 (6.6)	1.03 (0.78–1.36)	0.86



Acute kidney injury in the perioperative period and in intensive care units (excluding renal replacement therapies)

Carole Ichai[1*], Christophe Vinsonneau[2*], Bertrand Souweine[3], Fabien Armando[4], Emmanuel Canet[5], Christophe Clec'h[6], Jean-Michel Constantin[7], Michaël Darmon[8], Jacques Duranteau[9], Théophille Gaillot[10], Arnaud Garnier[11], Laurent Jacob[12], Olivier Joannes-Boyau[13], Laurent Juillard[14], Didier Journois[15], Alexandre Lautrette[16], Laurent Muller[17], Matthieu Legrand[18], Nicolas Lerolle[19], Thomas Rimmelé[20], Eric Rondeau[21], Fabienne Tamion[22], Yannick Walrave[3], Lionel Velly[23], Société française d'anesthésie et de réanimation (Sfar)Société de réanimation de langue française (SRLF)

SFAR

srlf SOCIÉTÉ DE RÉANIMATION DE LANGUE FRANÇAISE

(2016)

R 4-1: En réanimation, Il ne faut pas utiliser les HEA

R 4-2: Il faut probablement préférer les cristalloides aux colloides en cas de remplissage vasculaire.

R 4-3: Au bloc opératoire, il faut probablement préférer les cristalloides aux HEA sauf en cas de saignement grave.

R 4-4: Il faut probablement préférer les solutés balancés en cas de remplissage vasculaire important.

Effect of Hydroxyethyl Starch vs Saline for Volume Replacement Therapy on Death or Postoperative Complications Among High-Risk Patients Undergoing Major Abdominal Surgery

The FLASH Randomized Clinical Trial

2020

Emmanuel Futier, MD, PhD; Matthias Garot, MD; Thomas Godet, MD, PhD; Matthieu Biais, MD, PhD; Daniel Verzilli, MD; Alexandre Ouattara, MD, PhD; Olivier Huet, MD, PhD; Thomas Lescot, MD, PhD; Gilles Lebuffe, MD, PhD; Antoine Dewitte, MD, PhD; Anna Cadic, MD; Aymeric Restoux, MD, PhD;

Figure 2. Kaplan-Meier Estimates of the Probability of the Composite Primary Outcome

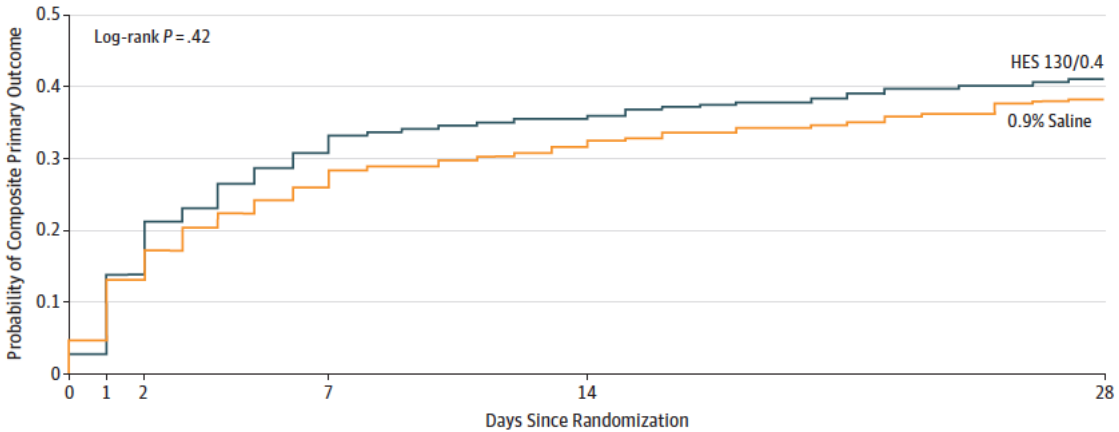


Table 3. Primary, Secondary, and Exploratory Outcomes (continued)

Outcomes	Hydroxyethyl Starch 130/0.4 (n = 389)	0.9% Saline (n = 386)	Absolute Difference (95% CI)	Relative Risk (95% CI)[a]	*P* Value[b]
Post Hoc Outcomes					
Death or major postoperative complications up to day 28, No. (%)[m]	159 (41)	148 (38)	2.5 (−4.4 to 9.4)	1.07 (0.90-1.27)	.47
Acute kidney injury up to day 28, No. (%)[n]	88 (23)	64 (17)	6.0 (0.5 to 11.6)	1.36 (1.02-1.82)	.04

Guidelines for the choice of intravenous fluids for vascular filling in critically ill patients, 2021☆,☆☆

Olivier Joannes-Boyau[a,*], Philippe Le Conte[b], Marie-Pierre Bonnet[c,d], Eric Cesareo[e], Benjamin Chousterman[f,g], Djamila Chaiba[h], Bénédicte Douay[i], Emmanuel Futier[j,k],

(2022)

These multidisciplinary guidelines focus only on the choice of fluid therapy per se and not on hemodynamic management or the reasons to perform vascular loading.

Two main questions

- Crystalloids or colloids ?
- Which crystalloid ?

Impact on mortality and morbidity
(adverse renal events & need for renal replacement therapy; Neurological prognosis)

Hemorrhagic shock

- Do not use colloid
- Prefer balanced crystalloids
- Do not use 3% or 7.5% hypertonic saline

Septic shock

- Do not use hydroxyethyl starch
- Prefer balanced crystalloids
- Do not use gelatins
- Do not use albumin as first-line solution
- No recommendation on albumin as second line solution for patients with severe hypoalbuminemia or needing high volume of fluids

Acute brain failure

- Do not use Colloids, and especially albumin
- Prefer Isotonic crystalloids

Peripartum

- No recommendation
  Due to lack of data

Balanced Crystalloids versus Saline in Critically Ill Adults

Matthew W. Semler, M.D., Wesley H. Self, M.D., M.P.H., Jonathan P. Wanderer, M.D., Jesse M. Ehrenfeld, M.D., M.P.H., Li Wang, M.S., Daniel W. Byrne, M.S., Joanna L. Stollings, Pharm.D.,

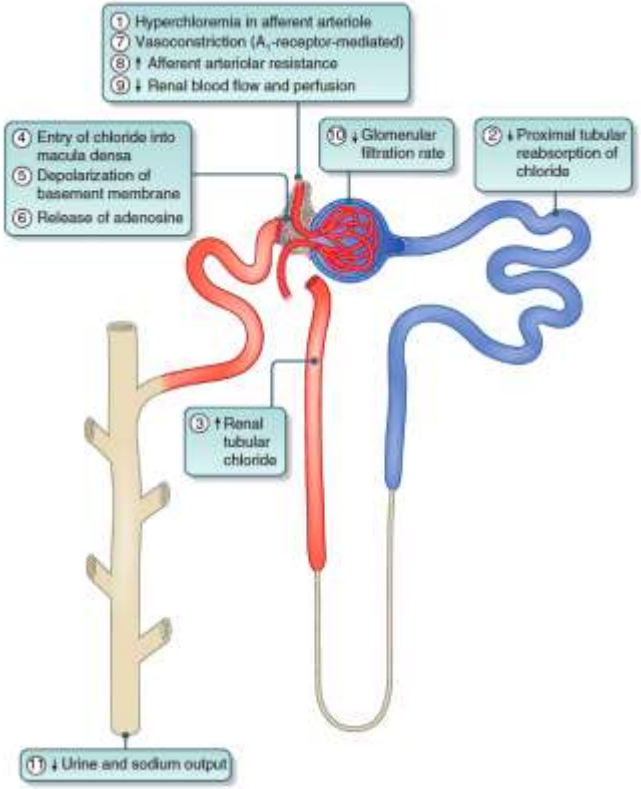
2018

Outcome	Balanced Crystalloids (N=7942)	Saline (N=7860)	Adjusted Odds Ratio (95% CI)†	P Value†
Primary outcome				
Major adverse kidney event within 30 days — no. (%)‡	1139 (14.3)	1211 (15.4)	0.90 (0.82 to 0.99)	0.04
Components of primary outcome				
In-hospital death before 30 days — no. (%)	818 (10.3)	875 (11.1)	0.90 (0.80 to 1.01)	0.06
Receipt of new renal-replacement therapy — no./total no. (%)§	189/7558 (2.5)	220/7458 (2.9)	0.84 (0.68 to 1.02)	0.08

Should chloride-rich crystalloids remain the mainstay of fluid resuscitation to prevent 'pre-renal' acute kidney injury?: con

2014

Dileep N. Lobo[1] and Sherif Awad[1]



Solutés

Composition	Plasma	NaCl 0,9%	Ringer's Lactate	Plasma-lyte	Isofundine
Na^+ (mmol/l)	142	154	130	140	145
K^+ (mmol/l)	4		4	5	4
Cl^- (mmol/l)	103	154	108	98	127
Ca^{2+} (mmol/l)	2,4		0,9	0	2,5
Mg^{2+} (mmol/l)	1			3	1
HCO_3^- (mmol/l)	27				
Autre (mmol/l)	Lactate 2		Lactate 27,6	Acetate 27 Gluconate 23	Acetate 27 Malate 5
Osmolarité (mOsmol/l)	285	308	277	295	309
pH	7,4	5-6,5	6-7,5	6,5-7,5	5-6,5

Hyperkaliémie ?

6 litres de sang, K^+ = 6 mmol/l

2 litres Ringer lactate, K^+ = 4 mmol/l

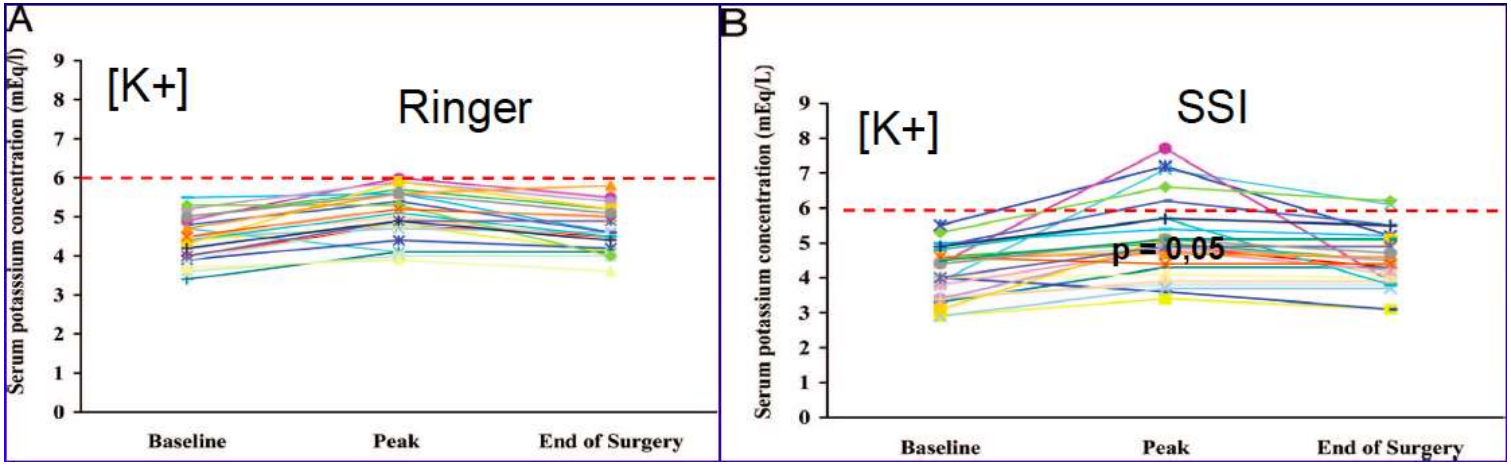
6 X 6 = 36 mmol, 2 X 4 = 8 mmol

44 mmol / 8 litres = 5,5 mmol/l

A Randomized, Double-Blind Comparison of Lactated Ringer's Solution and 0.9% NaCl During Renal Transplantation

Catherine M. N. O'Malley, FFARCSI*, Robert J. Frumento, MPH*, Mark A. Hardy, MD†, Alan I. Benvenisty, MD†, Tricia E. Brentjens, MD*, John S. Mercer, MD, and Elliott Bennett-Guerrero, MD*

2005



Acute kidney injury in the perioperative period and in intensive care units (excluding renal replacement therapies)

Carole Ichai[1*], Christophe Vinsonneau[2*], Bertrand Souweine[3], Fabien Armando[4], Emmanuel Canet[5], Christophe Clec'h[6], Jean-Michel Constantin[7], Michaël Darmon[8], Jacques Duranteau[9], Théophille Gaillot[10], Arnaud Garnier[11], Laurent Jacob[12], Olivier Joannes-Boyau[13], Laurent Juillard[14], Didier Journois[15], Alexandre Lautrette[16], Laurent Muller[17], Matthieu Legrand[18], Nicolas Lerolle[19], Thomas Rimmelé[20], Eric Rondeau[21], Fabienne Tamion[22], Yannick Walrave[3], Lionel Velly[23], Société française d'anesthésie et de réanimation (Sfar)Société de réanimation de langue française (SRLF)

SFAR

srlf SOCIÉTÉ DE RÉANIMATION DE LANGUE FRANÇAISE

(2016)

R 4-5: Il faut maintenir un niveau minimal de PAM compris entre 60 et 70 mmHg pour prévenir et traiter l'IRA.

R 4-7: Il ne faut probablement pas retarder la réalisation d'examens complémentaires ou l'administration de médicaments potentiellement nephrotoxiques s'ils sont nécessaires à la prise en charge du traitement.

Association of Intraoperative Hypotension with Acute Kidney Injury after Elective Noncardiac Surgery

Louise Y. Sun, M.D., S.M., Duminda N. Wijeysundera, M.D., Ph.D., Gordon A. Tait, Ph.D., W. Scott Beattie, M.D., Ph.D.

2015

Table 2. Proportion Experiencing AKI, Stratified by Hypotension Duration for MAP Thresholds of 55, 60, and 65 mmHg

	MAP < 55 mmHg		MAP < 60 mmHg		MAP < 65 mmHg	
IOH Duration (min)	N	AKI	N	AKI	N	AKI
1–5	2,807	189 (6.7%)	2,490	137 (5.5%)	1,474	64 (4.3%)
6–10	637	63 (9.9%)	1,030	64 (6.2%)	1,252	79 (6.3%)
11–20	63	7 (11.1%)	579	67 (11.6%)	1,182	80 (6.8%)
>20	23	4 (17.4%)	274	30 (11.0%)	903	92 (10.2%)

Table 5. Comparison of Odds Ratios of Acute Kidney Injury across Mean Arterial Pressure "Bands" (*i.e.*, MAP <55, 55–59, and 60–64 mmHg)

Mean Arterial Pressure Band (mmHg)	Duration of Intraoperative Hypotension (min)				
	0	1–5	6–10	11–20	>20
<55	Reference	1.23 (0.87–1.74)	1.51 (1.00–2.30)	1.44 (0.94–2.19)	2.09 (1.40–3.11)
55–59	Reference	1.04 (0.67–1.62)	1.13 (0.69–1.84)	1.23 (0.77–1.97)	1.74 (1.13–2.69)
60–64	Reference	1.43 (0.68–3.00)	1.15 (0.53–2.50)	1.69 (0.83–3.43)	2.00 (1.01–3.95)

Effect of Individualized vs Standard Blood Pressure Management Strategies on Postoperative Organ Dysfunction Among High-Risk Patients Undergoing Major Surgery

A Randomized Clinical Trial

2018

Emmanuel Futier, MD, PhD; Jean-Yves Lefrant, MD, PhD; Pierre-Gregoire Guinot, MD, PhD; Thomas Godet, MD, PhD; Emmanuel Lorne, MD; Philippe Cuvillon, MD, PhD; Sebastien Bertran, MD; Marc Leone, MD, PhD; Bruno Pastene, MD; Vincent Piriou, MD, PhD; Serge Molliex, MD, PhD; Jacques Albanese, MD, PhD; Jean-Michel Julia, MD; Benoit Tavernier, MD, PhD; Etienne Imhoff, MD; Jean-Etienne Bazin, MD, PhD; Jean-Michel Constantin, MD, PhD; Bruno Pereira, PhD; Samir Jaber, MD, PhD; for the INPRESS Study Group

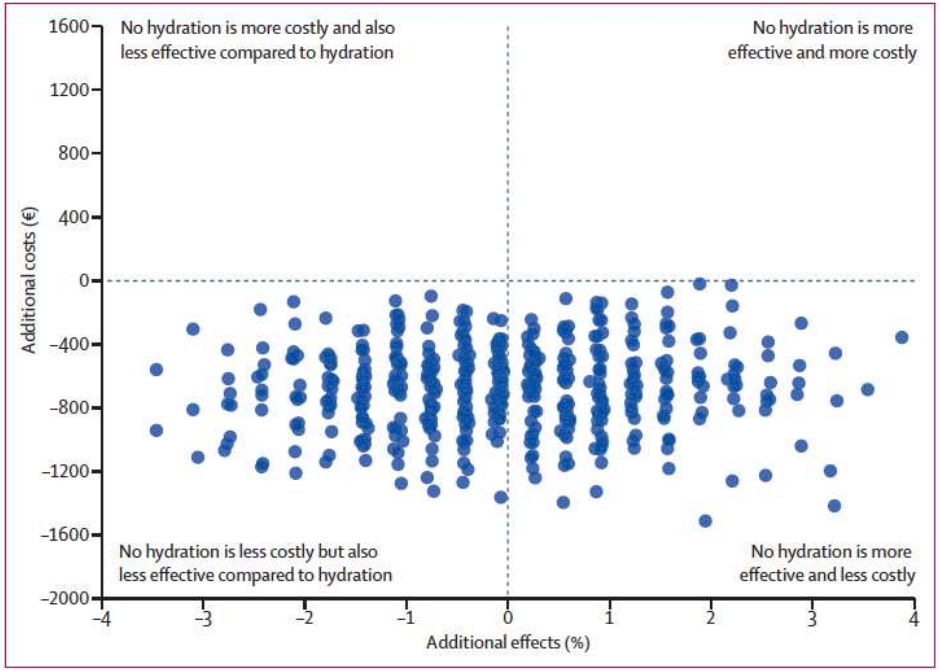
Table 3. Primary and Secondary Outcomes and Adverse Events

Variable	Individualized Treatment (n = 147)	Standard Treatment (n = 145)	Between-Group Absolute Difference, % (95% CI)	Unadjusted Relative Risk (95% CI)	*P* Value	Adjusted Relative Risk (95% CI)[a]	*P* Value
Primary Outcome							
Primary composite outcome, No. (%)[b]	56 (38.1)	75 (51.7)	−14 (−25 to −2)	0.74 (0.57 to 0.95)	.02	0.73 (0.56 to 0.94)	.02
Secondary Outcomes							
Acute kidney injury according to RIFLE criteria, No. (%)[d]							
Risk	23 (15.7)	36 (24.8)	−9 (−18 to 0)	0.63 (0.39 to 1.00)	.05	0.73 (0.47 to 1.14)	.17
Injury	16 (10.9)	26 (17.9)	−7 (−15 to 1)	0.61 (0.34 to 1.08)	.09	0.61 (0.34 to 1.08)	.09
Failure	9 (6.1)	9 (6.2)	0 (−6 to 5)	0.99 (0.40 to 2.41)	.98	0.97 (0.40 to 2.34)	.95
Use of renal replacement therapy, No. (%)	4 (2.7)	5 (3.5)	0 (−5 to 3)	0.79 (0.22 to 2.88)	.72	0.81 (0.22 to 2.97)	.76

Prophylactic hydration to protect renal function from intravascular iodinated contrast material in patients at high risk of contrast-induced nephropathy (AMACING): a prospective, randomised, phase 3, controlled, open-label, non-inferiority trial

2017

Estelle C Nijssen, Roger J Rennenberg, Patty J Nelemans, Brigitte A Essers, Marga M Janssen, Marja A Vermeeren, Vincent van Ommen, Joachim E Wildberger



Acute kidney injury in the perioperative period and in intensive care units (excluding renal replacement therapies)

Carole Ichai[1*], Christophe Vinsonneau[2*], Bertrand Souweine[3], Fabien Armando[4], Emmanuel Canet[5], Christophe Clec'h[6], Jean-Michel Constantin[7], Michaël Darmon[8], Jacques Duranteau[9], Théophille Gaillot[10], Arnaud Garnier[11], Laurent Jacob[12], Olivier Joannes-Boyau[13], Laurent Juillard[14], Didier Journois[15], Alexandre Lautrette[16], Laurent Muller[17], Matthieu Legrand[18], Nicolas Lerolle[19], Thomas Rimmelé[20], Eric Rondeau[21], Fabienne Tamion[22], Yannick Walrave[3], Lionel Velly[23], Société française d'anesthésie et de réanimation (Sfar)Société de réanimation de langue française (SRLF)

(2016)

R 5-3: Il faut probablement utiliser les aminosides si nécessaire en appliquant les règles suivantes:

- **Les administrer en une injection par jour,**
- **Monitorer les taux résiduels au delà d'une injection**
- **Les administrer au maximum 3 jours à chaque fois que possible**

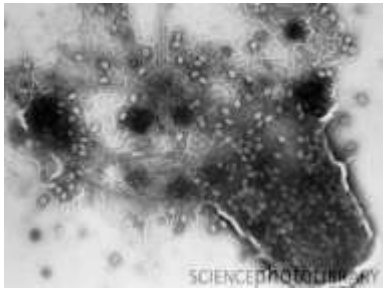
Aminoglycoside

Aminoglycoside dose
(30 min)
(Genta = 6-8 mg/kg)
(Amik = 30 mg/kg)

30 min → **Pic**

Genta = 30-40 mg/L
Amik = 60-80 mg/L

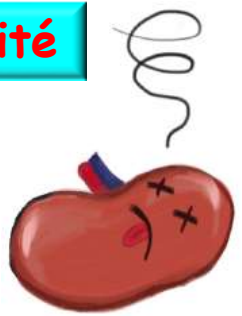
Efficacité



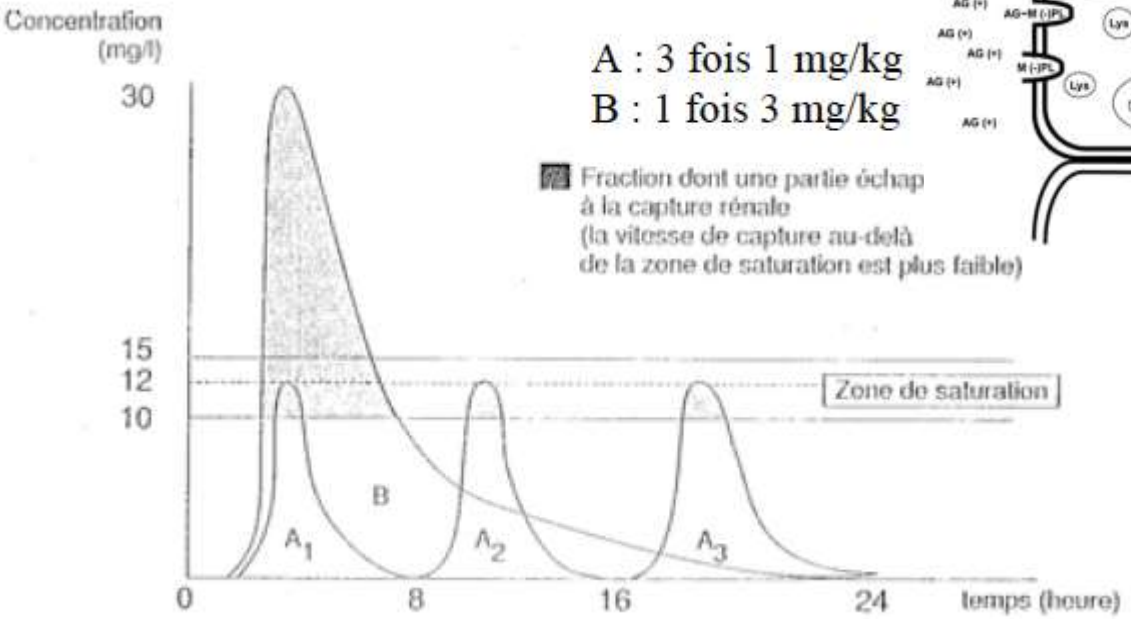
22 h → **Vallée**

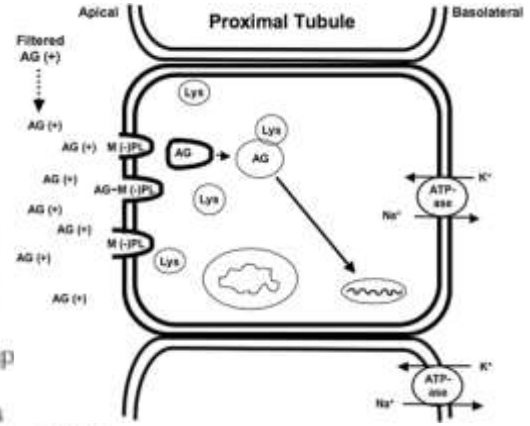
Genta < 0.5 mg/L
Amik < 2 mg/L

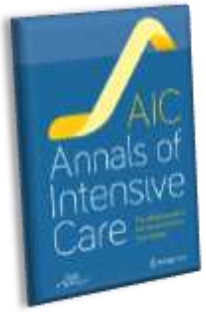
Toxicité



Toxicité


Concentration (mg/l)
30
15
12
10
A : 3 fois 1 mg/kg
B : 1 fois 3 mg/kg
Fraction dont une partie échap à la capture rénale (la vitesse de capture au-delà de la zone de saturation est plus faible)
Zone de saturation
A1
B
A2
A3
0
8
16
24
temps (heure)


Apical
Proximal Tubule
Basolateral
Filtered AG (+)
Lys
AG
ATP-ase
K+
Na+



Impact of a high loading dose of amikacin in patients with severe sepsis or septic shock

(2016)

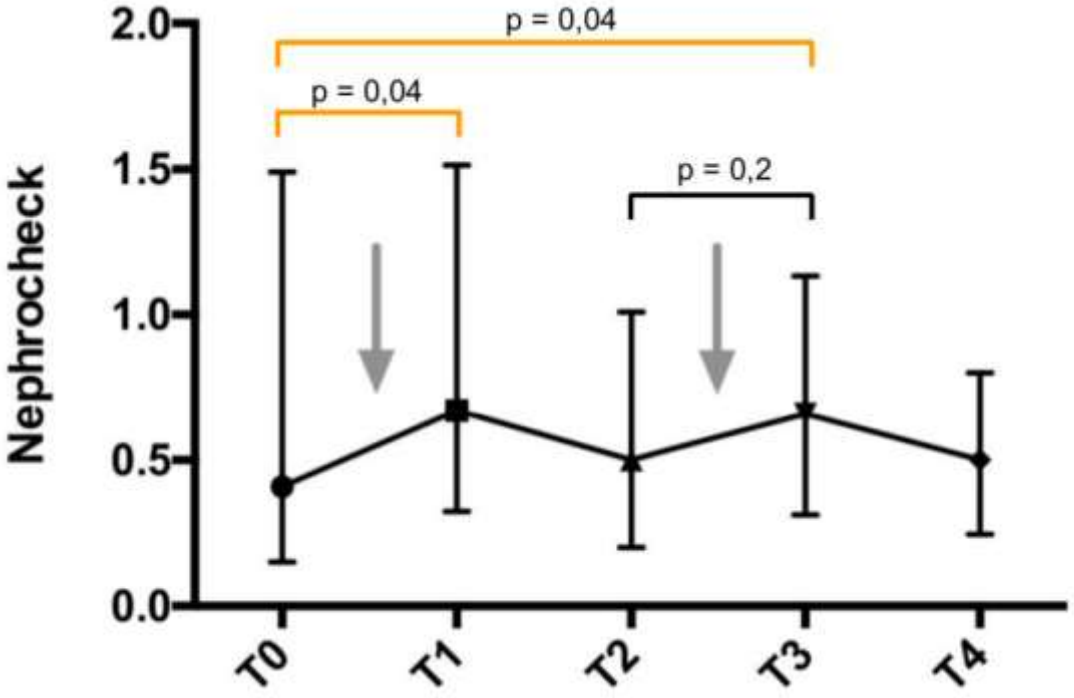
Nicolas Allou[1*], Astrid Bouteau[2], Jérôme Allyn[1], Aurélie Snauwaert[2], Dorothée Valance[1], Julien Jabot[1], Bruno Bouchet[1], Richard Galliot[1], Laure Corradi[1], Philippe Montravers[2] and Pascal Augustin[2]

Table 5 Multivariate analysis of risk factors for in-intensive care unit mortality

Variables	Adjusted odds ratio (CI 95%)	*P* value
Age (per year increment)	1.044 (1.01–1.08)	0.02
Norepinephrine (per µg/kg/min increment)	3.94 (1.9–8.15)	0.0001
Amikacin C_{max}		
Between 60 and 80 mg/L	Reference	Reference
<60 mg/L	1.92 (0.46–8.24)	0.4
>80 mg/L	3.96 (1.54–10.2)	0.004
Prothrombin time	0.98 (0.96–1.01)	0.118
PaO_2/FiO_2 ratio	0.99 (0.99–1)	0.28
Diabetes mellitus	1.6 (0.59–4.38)	0.32
Glomerular filtration rate (mL/min)	0.99 (0.98–1.01)	0.43
Lactate level	1.01 (0.89–1.14)	0.53
SOFA	1.03 (0.81–1.3)	0.18

Protocole TANG

« Toxicity of Aminosides evaluated by Nephrocheck and Glomerular function »



Acute kidney injury in the perioperative period and in intensive care units (excluding renal replacement therapies)

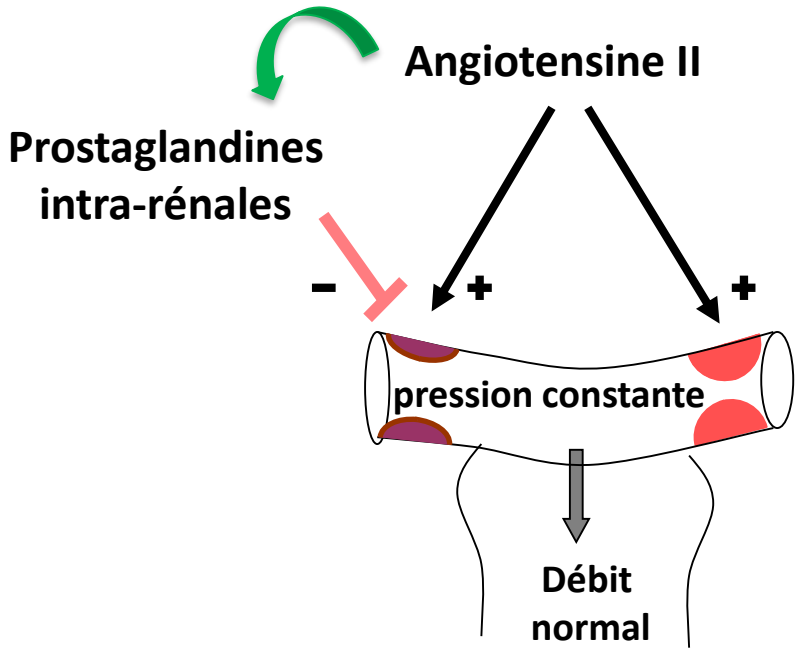
Carole Ichai[1*], Christophe Vinsonneau[2*], Bertrand Souweine[3], Fabien Armando[4], Emmanuel Canet[5], Christophe Clec'h[6], Jean-Michel Constantin[7], Michaël Darmon[8], Jacques Duranteau[9], Théophille Gaillot[10], Arnaud Garnier[11], Laurent Jacob[12], Olivier Joannes-Boyau[13], Laurent Juillard[14], Didier Journois[15], Alexandre Lautrette[16], Laurent Muller[17], Matthieu Legrand[18], Nicolas Lerolle[19], Thomas Rimmelé[20], Eric Rondeau[21], Fabienne Tamion[22], Yannick Walrave[3], Lionel Velly[23], Société française d'anesthésie et de réanimation (Sfar)Société de réanimation de langue française (SRLF)

(2016)

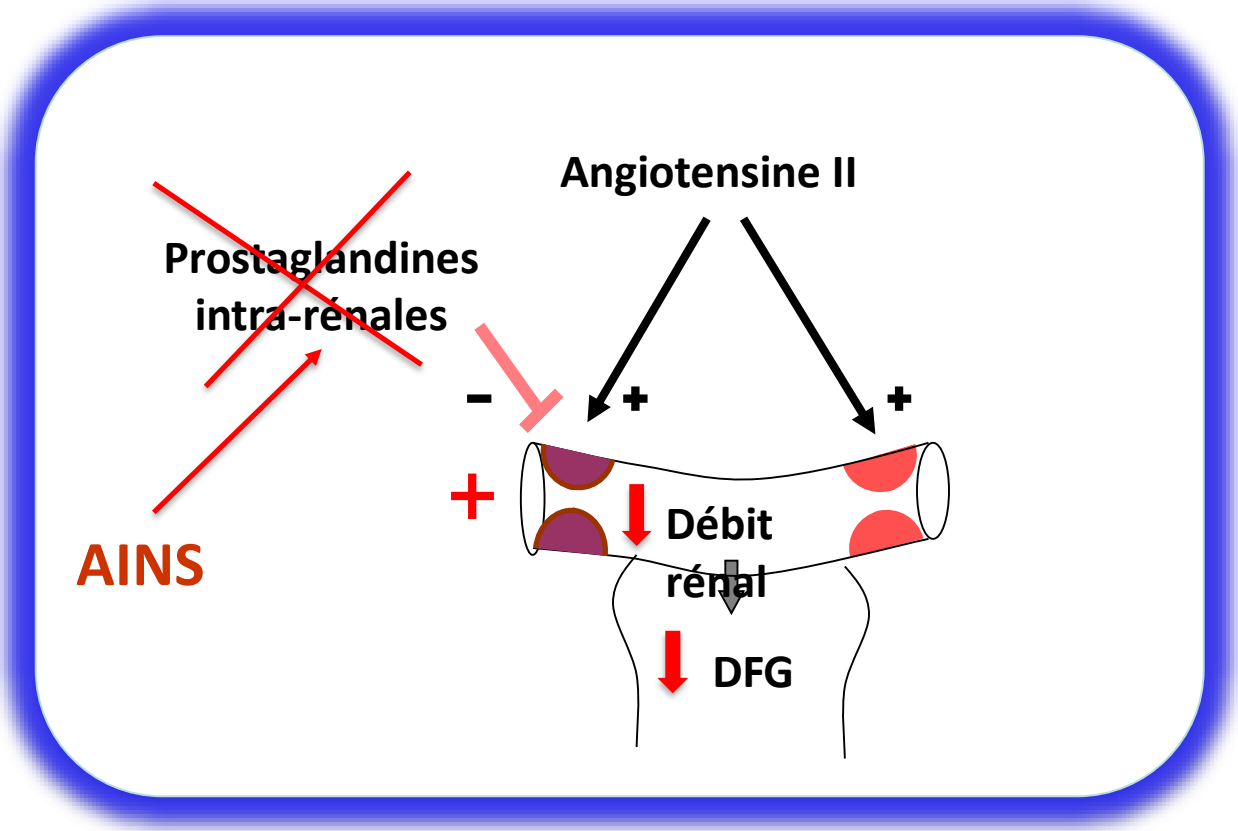
R5.4 – Il faut probablement ne pas utiliser les anti-inflammatoires non stéroïdiens (AINS), inhibiteurs de l'enzyme de conversion (IEC) et antagonistes des récepteurs de l'angiotensine 2 (ARA 2) chez les patients à risque d'IRA.

(Avis d'experts) Accord Fort

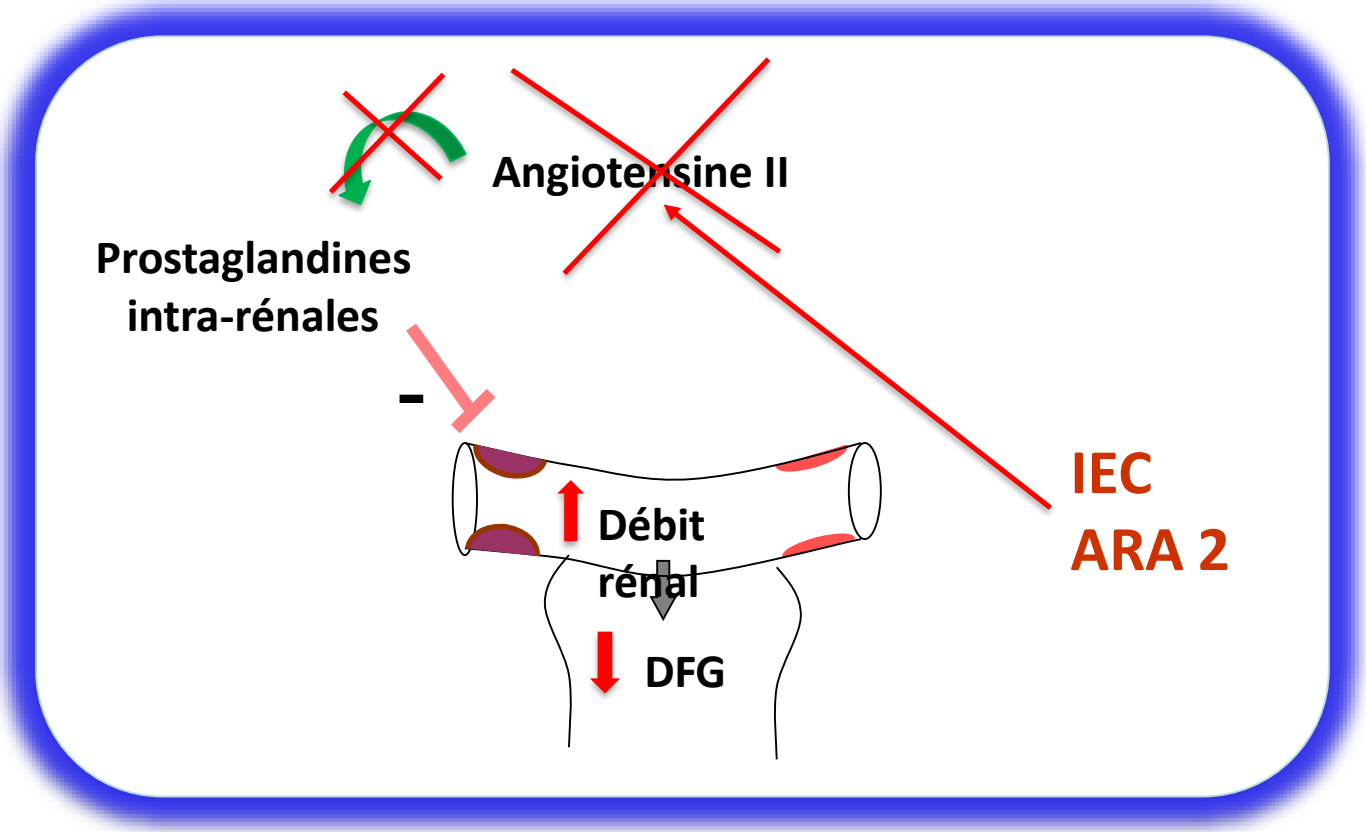
Hypovolémie modérée

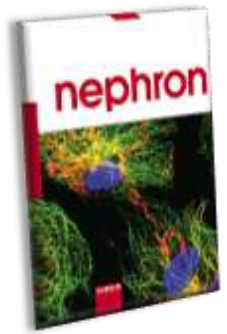


Médicaments



Médicaments

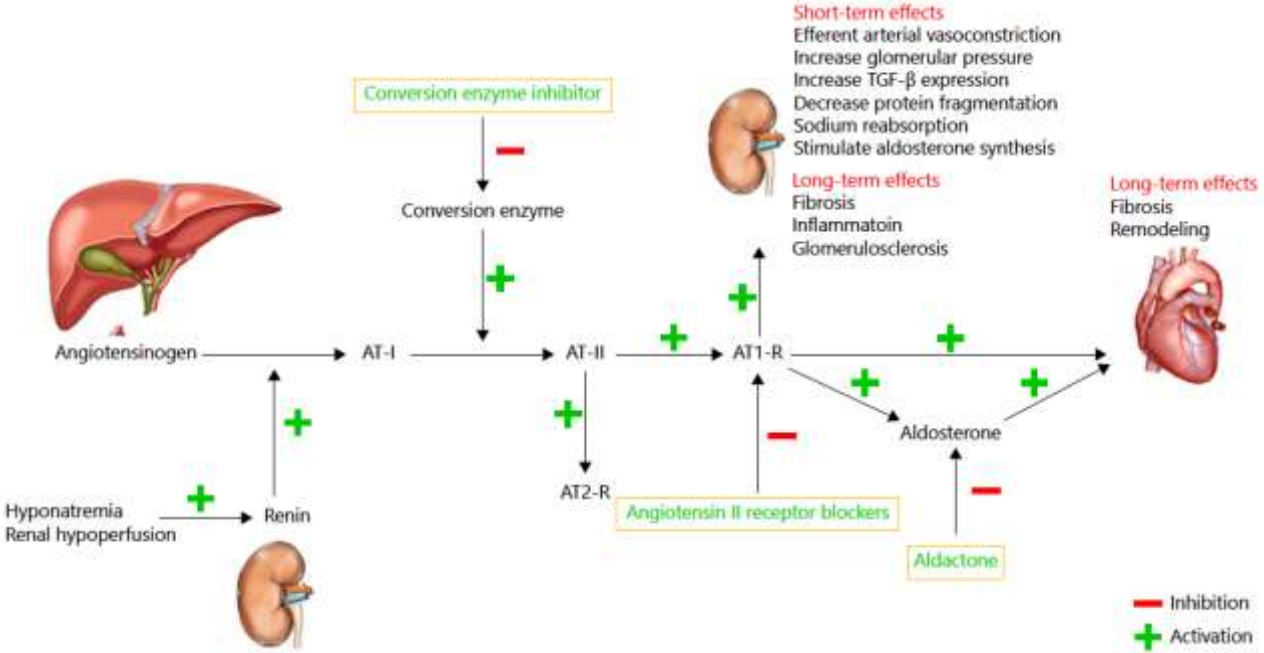




Is the Renin-Angiotensin-Aldosterone System Good for the Kidney in Acute Settings?

2019

Emmanuel Dudoignon[a, b] François Dépret[a–c] Matthieu Legrand[a–c]



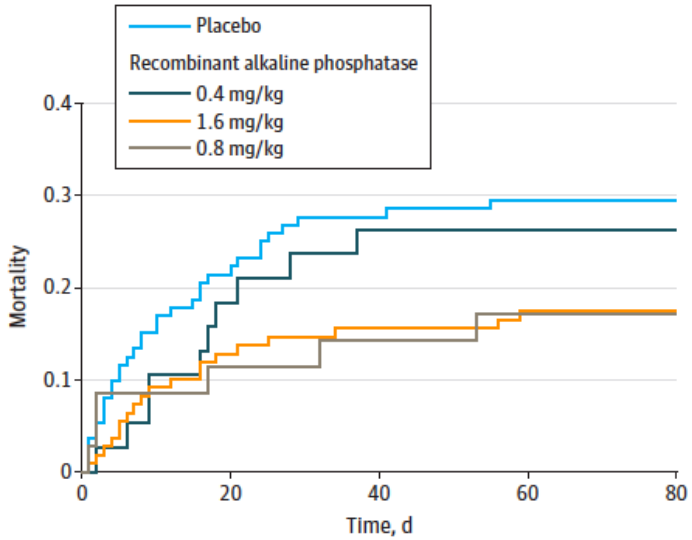
Effect of Human Recombinant Alkaline Phosphatase on 7-Day Creatinine Clearance in Patients With Sepsis-Associated Acute Kidney Injury

A Randomized Clinical Trial

2018

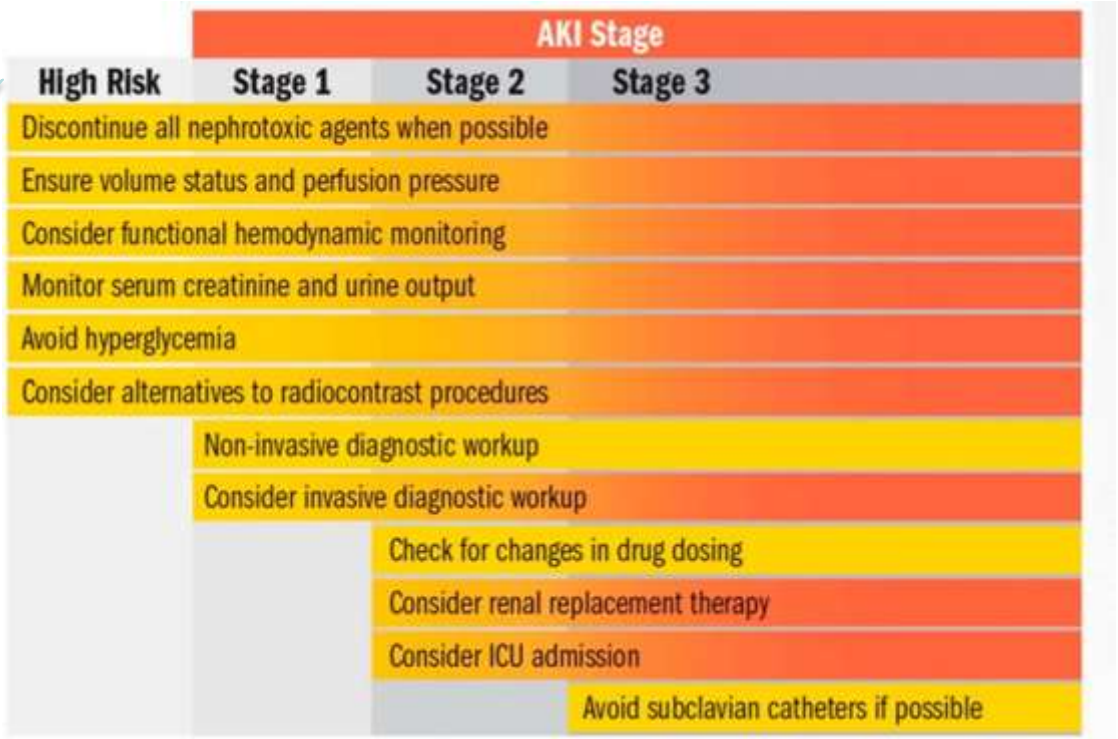
Peter Pickkers, MD, PhD; Ravindra L. Mehta, MD; Patrick T. Murray, MD; Michael Joannidis, MD; Bruce A. Molitoris, MD; John A. Kellum, MD; Mirjam Bachler, PhD; Eric A. J. Hoste, MD, PhD; Oscar Hoiting, MD; Kenneth Krell, MD; Marlies Ostermann, MD, PhD; Wim Rozendaal, MD; Miia Valkonen, MD, PhD; David Brealey, MD, PhD; Albertus Beishuizen, MD, PhD; Ferhat Meziani, MD, PhD; Raghavan Murugan, MD, MS, FRCP; Hilde de Geus, MD, PhD; Didier Payen, MD, PhD; Erik van den Berg, MSc; Jacques Arend, MD; for the STOP-AKI Investigators

Figure 3. Cumulative Incidence of Fatal Events From Baseline to 90 Days for All Treatment Groups in the Safety Data Population of Patients Who Were Critically Ill With Sepsis-Associated Acute Kidney Infection



AKI Guidelines

Biomarqueurs

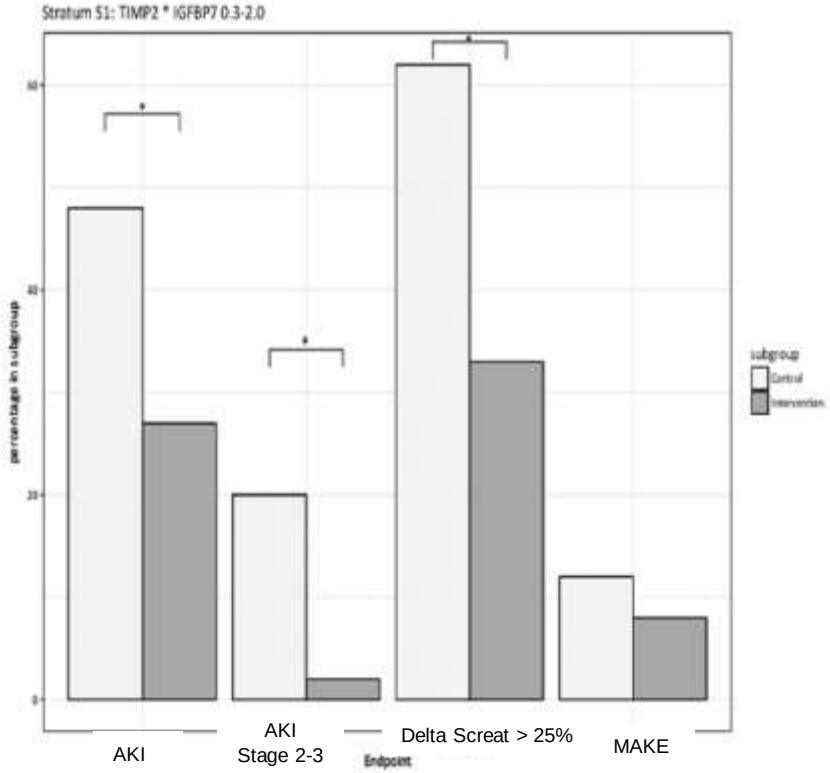


Biomarker-guided Intervention to Prevent Acute Kidney Injury After Major Surgery

The Prospective Randomized BigpAK Study

2017

Ivan Göcze, MD, Dominik Jauch, MD,† Markus Götz, MD,* Pascal Kennedy,* Bettina Jung, MD,‡ Florian Zeman,§ Carsten Gnewuch, MD,¶ Bernhard M. Graf, MD,|| Wolfgang Gnann,** Bernhard Banas, MD,‡ Thomas Bein, MD,|| Hans J. Schlitt, MD,* and Tobias Bergler, MD‡*



Biomarker-guided Intervention to Prevent Acute Kidney Injury After Major Surgery

The Prospective Randomized BigpAK Study

Ivan Göcze, MD, Dominik Jauch, MD,† Markus Götz, MD,* Pascal Kennedy,* Bettina Jung, MD,‡ Florian Zeman,§ Carsten Gnewuch, MD,¶ Bernhard M. Graf, MD,|| Wolfgang Gnann,** Bernhard Banas, MD,‡ Thomas Bein, MD,|| Hans J. Schlitt, MD,* and Tobias Bergler, MD‡*

2017

TABLE 3. Clinical Outcomes for Intervention Group Versus Standard Care Group

	Intervention n = 60	Standard Care n = 61	Effect Estimate (95% CI)	*P*
Primary outcome				
Overall AKI (%)	19 (31.7)	29 (47.5)	1.96 (0.93, 4.10)*	0.076
Secondary outcomes				
AKI stage II and III (%)	4 (6.7)	12 (19.7)	3.43 (1.04, 11.32)*	**0.035**
Relevant Cr increase (ΔCr >25%) (%)	24 (40.0)	38 (62.3)	2.48 (1.19, 5.15)*	**0.015**
ICU length of stay, median (IQR) days	3 (2–5)	3 (2–7)	1 (0,2)†	**0.035**
Hospital length of stay, median (IQR) days	16 (12–22)	21 (15–39)	5 (0, 8)†	**0.036**
Requirement of RRT during hospital stay no (%)	2 (3.3)	4 (6.6)	2.04 (0.36, 11.55)*	0.663
In-hospital mortality (%)	4 (6.7)	5 (8.2)	1.25 (0.32, 4.90)*	0.981
MAKE by discharge (%)	5 (8.3)	8 (13.1)	1.66 (0.51, 5.40)*	0.399
Relative change urine (TIMP-2) × (IGFBP7) 12 h vs baseline, $(ng/mL)^2/1000$, median (IQR)	2.66 (1.41–7.04)	1.84 (0.78–3.19)	−0.825 (−1.7, 0.08)†	**0.028**

Long-Term Follow-Up of Patients after Acute Kidney Injury: Patterns of Renal Functional Recovery

Etienne Macedo[1], Dirce M. T. Zanetta[2], Regina C. R. M. Abdulkader[1]*

2012

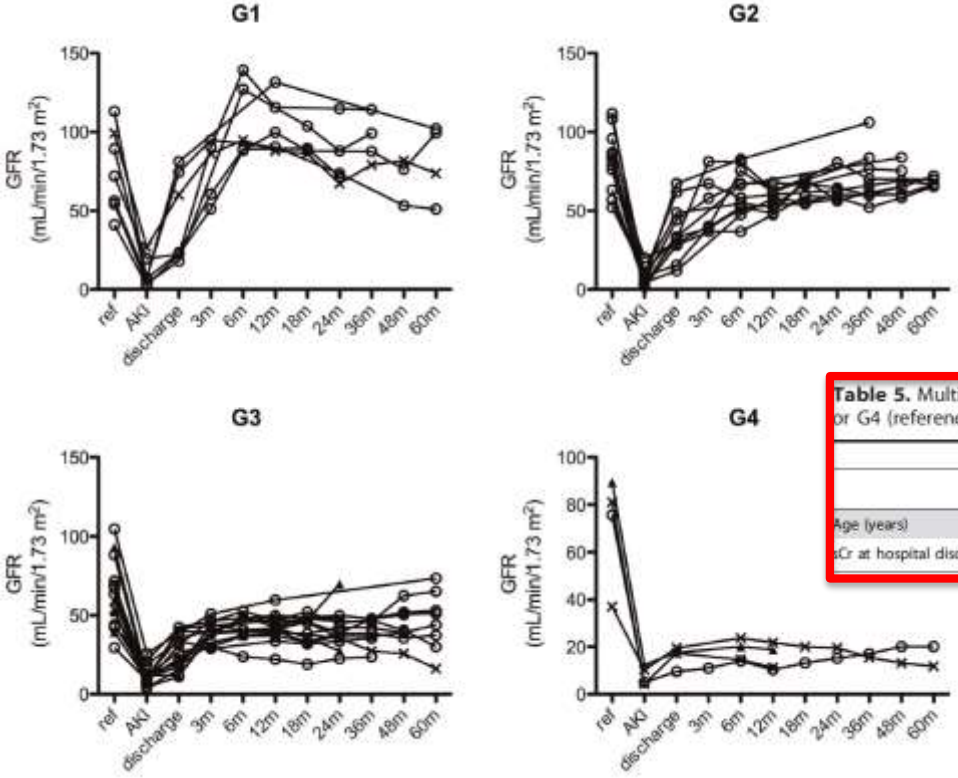
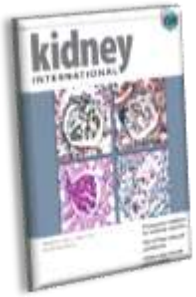


Table 5. Multiple variable logistic regression for being in G3 or G4 (reference: G1 and G2 grouped).

	OR	CI	P
Age (years)	1.092	1.041–1.146	<0.0001
sCr at hospital discharge (mg/dL)	2.461	1.282–4.727	0.007



Nephrologist follow-up improves all-cause mortality of severe acute kidney injury survivors

Ziv Harel[1,2,3], Ron Wald[1,3], Joanne M. Bargman[1], Muhammad Mamdani[2,3,4], Edward Etchells[2,4], Amit X. Garg[4,5], Joel G. Ray[2,3,4], Jin Luo[4], Ping Li[4], Robert R. Quinn[6], Alan Forster[4,7], Jeff Perl[1,3] and Chaim M. Bell[2,3,4]

2013

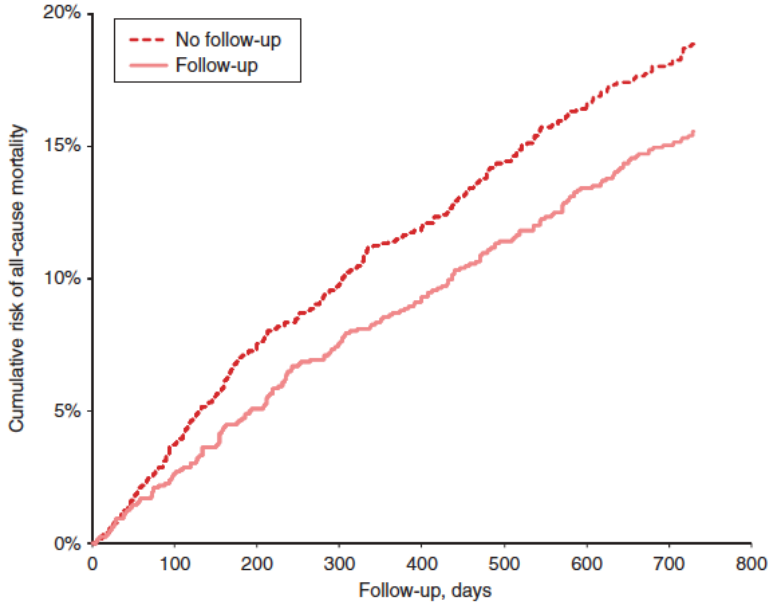


Figure 2 | Risk of all-cause mortality in survivors of severe acute kidney injury (AKI).

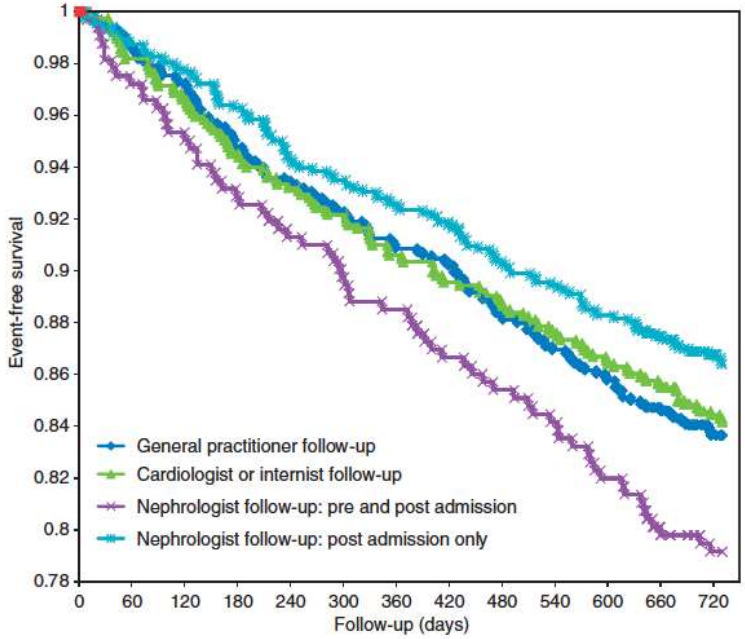


Figure 4 | Survival curve of follow-up by specialty.

Conclusion

- AKI augmente la mortalité et la morbidité
- Meilleure prévention = « Primum non nocere »
  - . Éviter les agents néphrotoxiques
  - . Maintenir l'hémodynamique (PA)
  - . Prévenir les agressions x, répétées, prolongées
  - . Eviter la surcharge hydrique (congestion rénale)
  - . Mais éviter une stratégie trop restrictive
- Place des biomarqueurs pour guider la prévention
- Prévoir un suivi néphrologique si AKI