Gestion des infections nosocomiales sous ECMO

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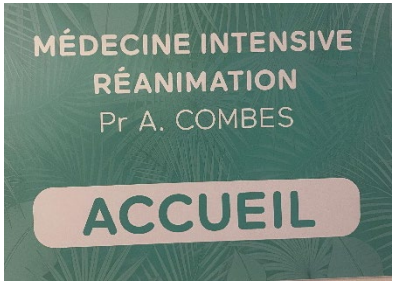
Conflits d’intérêts

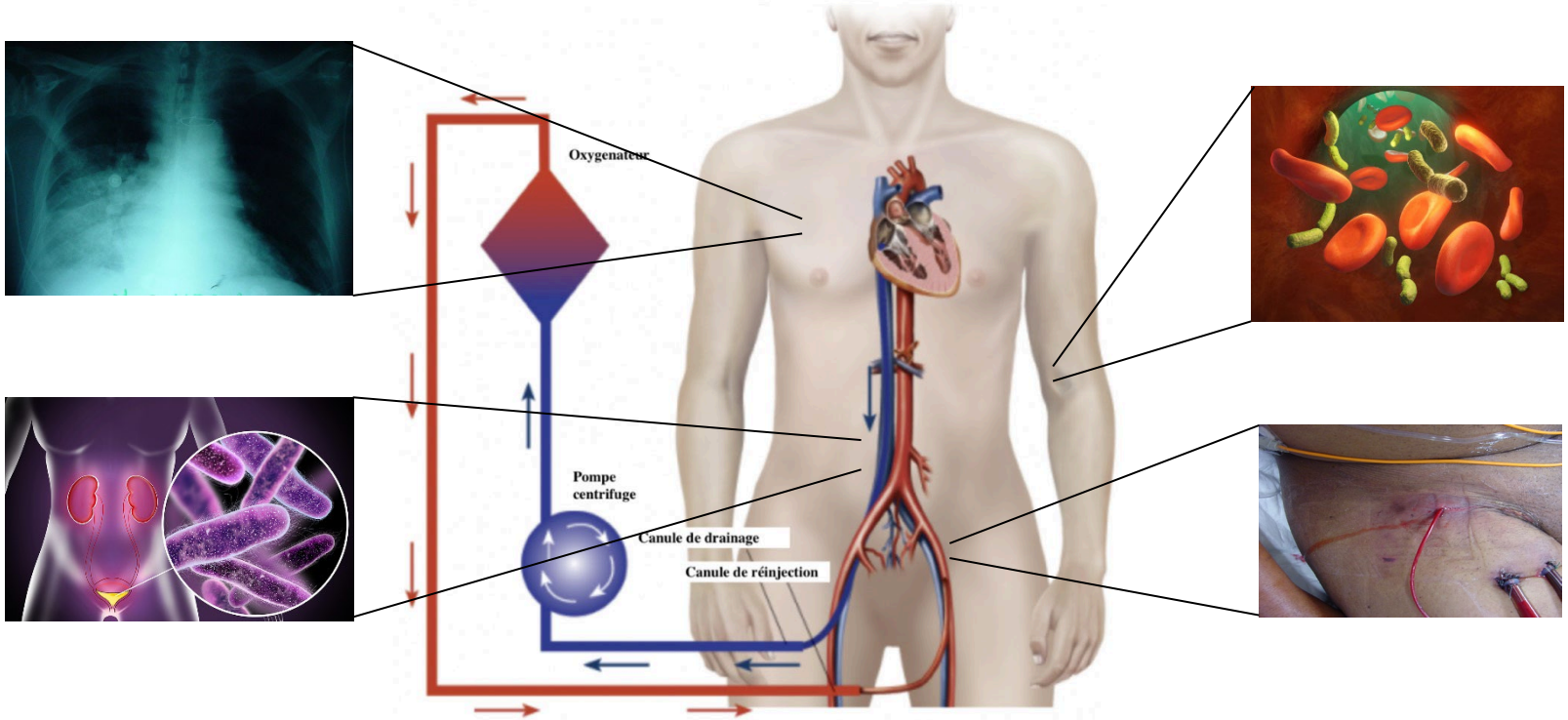
- Personnels (3 dernières années)
  - AdvanzPharma, Merck, Pfizer, Shionogi

- Financement recherche
  - Merck, Eumedica

Avertissement

- L’aphorisme « quand un malade arrive en MIR chez Combes à la Pitié, on lui met une ECMO et après on réfléchit » est faux….
  au moins pour les acidocétoses diabétiques

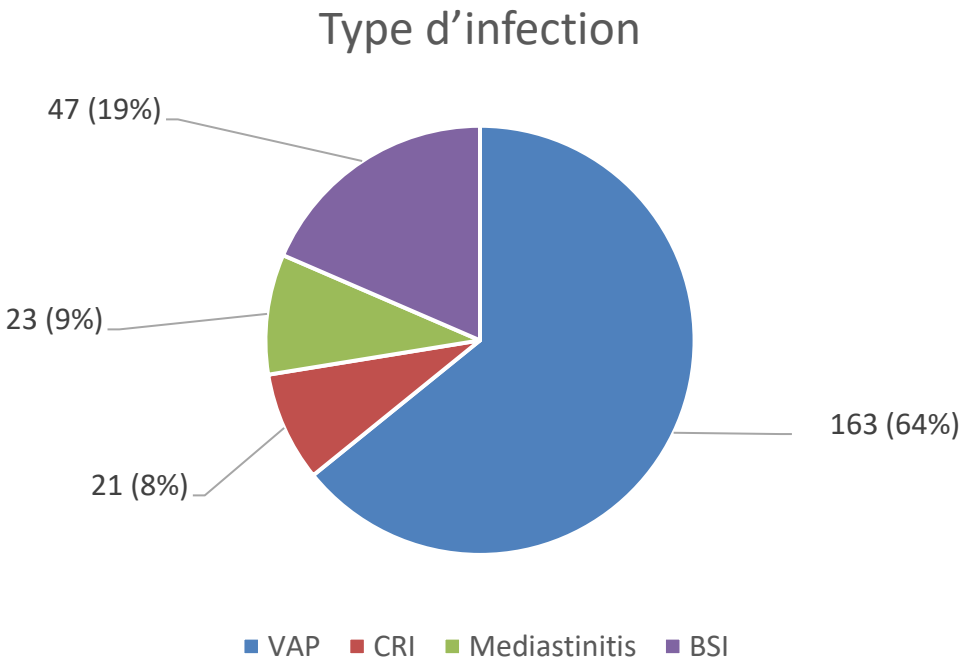



Oxygenateur
Pompe centrifuge
Canule de drainage
Canule de réinjection

Nosocomial Infections in Adult Cardiogenic Shock Patients Supported by Venoarterial Extracorporeal Membrane Oxygenation

Matthieu Schmidt,[1] Nicolas Bréchot,[1] Sarah Hariri,[2] Marguerite Guiguet,[4] Charles Edouard Luyt,[1] Ralouka Makri,[2] Pascal Leprince,[3] Jean-Louis Trouillet,[1] Alain Pavie,[3] Jean Chastre,[1] and Alain Combes[1]

Clinical infectious disease 2012



Incidence, risk factors and outcomes of nosocomial infection in adult patients supported by extracorporeal membrane oxygenation: a systematic review and meta-analysis

Critical Care (2024) 28:158

Ali Ait Hssain[1,2,3], Amir Vahedian-Azimi[4*], Abdulsalam Saif Ibrahim[1,2], Ibrahim Fawzy Hassan[1,2], Elie Azoulay[5] and Michael Darmon[5]

- Infection: incidence 26% (IC 95%, 14-38%)
  - PAVM: 23.9 - 55.4%
  - « Respiratory tract infection »: 1.99 - 33%
  - Bactériémies: 2.98 - 24.7%
  - Site opératoire: 3.97 - 17%
  - Site de canulation: 7.1 - 11%

Nosocomial Infections in Adult Cardiogenic Shock Patients Supported by Venoarterial Extracorporeal Membrane Oxygenation

Matthieu Schmidt,[1] Nicolas Bréchot,[1] Sarah Hariri,[2] Marguerite Guiguet,[4] Charles Edouard Luyt,[1] Ralouka Makri,[2] Pascal Leprince,[3] Jean-Louis Trouillet,[1] Alain Pavie,[3] Jean Chastre,[1] and Alain Combes[1]

Clinical infectious disease 2012

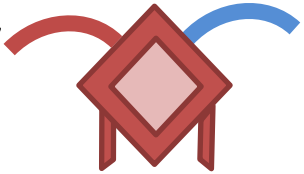
Ventilator-Associated Pneumonia, n = 163[a]		Cannula Infection, n = 21[b]		Poststernotomy Mediastinitis, n = 23[c]		Bloodstream Infection, n = 47[d]	
Organism	No. (%)	Organism	No. (%)	Organism	No. (%)	Organism	No. (%)
Pseudomonas aeruginosa	43 (26)	*Escherichia coli*	5 (24)	*Candida* spp.	8 (35)	*P. aeruginosa*	10 (21)
Polymicrobial[e]	19 (12)	*Enterococcus* spp.	4 (19)	*Staphylococcus epidermidis*	7 (30)	*Enterococcus* spp.	7 (15)
Staphylococcus aureus	16 (10)	*S. epidermidis*	4 (19)	*P. aeruginosa*	2 (9)	*Escherichia coli*	6 (13)
Enterobacter sp.	16 (10)	Polymicrobial[f]	3 (14)	*S. aureus*	2 (9	*S. epidermidis*	5 (10)
Escherichia coli	14 (9)	*S. aureus*	2 (10)	*Escherichia coli*	2 (9)	*S. aureus*	4 (9)
Haemophilus influenzae	14 (9)	*P. aeruginosa*	2 (10)	*Enterobacter* spp.	1 (4)	*Streptococcus* spp.	3 (6)
Klebsiella spp.	10 (6)	*Proteus mirabilis*	1 (5)	*Neisseria* sp.	1 (4)	*Enterobacter* spp.	3 (6)
Neisseria spp.	5 (3)					*Candida* spp.	3 (6)
Proteus mirabilis	5 (3)					*Anaerobes* spp.[g]	3 (6)
Streptococcus spp.	4 (2)					*Citrobacter* sp.	1 (2)
Hafnia alvei	3 (2)					*Proteus mirabilis*	1 (2)
Enterococcus spp.	3 (2)					Polymicrobial	1 (2)
Serratia marcescens	3 (2)						
Citrobacter spp.	2 (1)						
Candida spp.	2 (1)						
S. epidermidis	1 (1)						
Aspergillus	1 (1)						
Acinetobacter baumannii	1 (1)						
Anaerobes	1 (1)						

Etude rétrospective sur 12 réanimations européennes

- 182 patients avec une bactériémie « primaire »
- Pathogènes
  - *Enterococcus* spp 37,4%
  - Enterobacterales 26,9%
  - CoN *Staphylococcus* 15,9%
  - Autres BGN 11,5%

Massart et al., soumis

Characteristics and outcomes of ECMO cannula-site infection (CSI) a European multicenter retrospective study

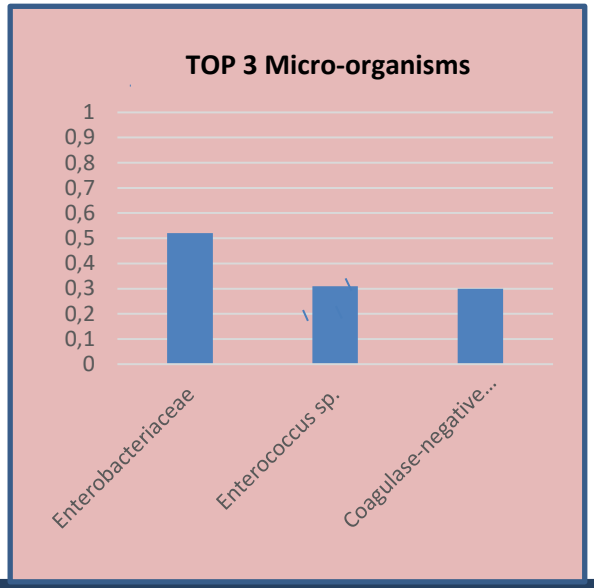


109 patients avec une infection du site de canulation dans 12 centres européens

Délai ECMO-CSI 8 jours [6-15]

57% en choc septique

72% associées à bactériémie
39% infections polymicrobiennes
17% MDR



14% rechute

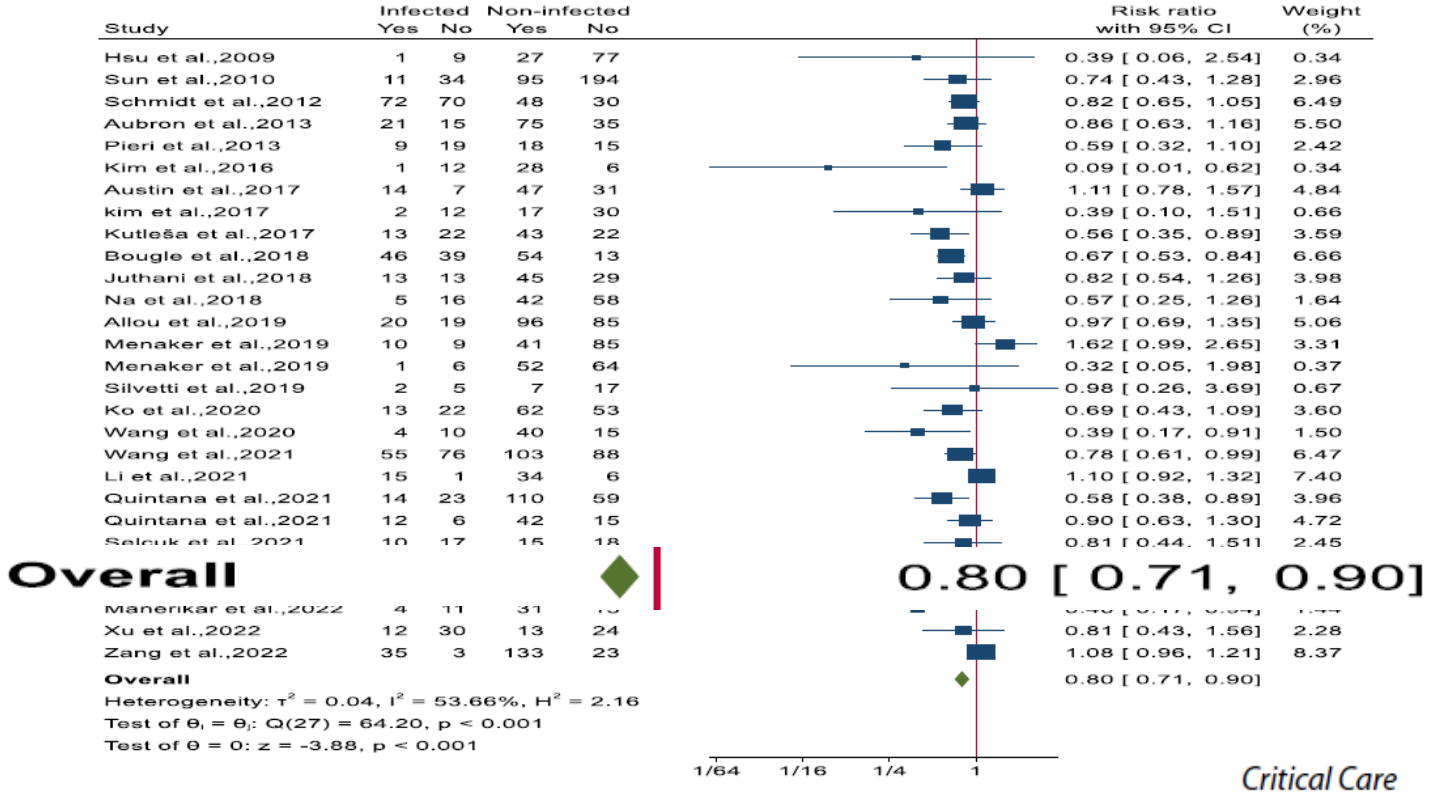
Durée d'ECMO
15 jours [9-23]

Mortalité
30% sous ECMO
51% en réanimation

Ortuno et al., soumis

Incidence, risk factors and outcomes of nosocomial infection in adult patients supported by extracorporeal membrane oxygenation: a systematic review and meta-analysis

Pronostic: mortalité hospitalière

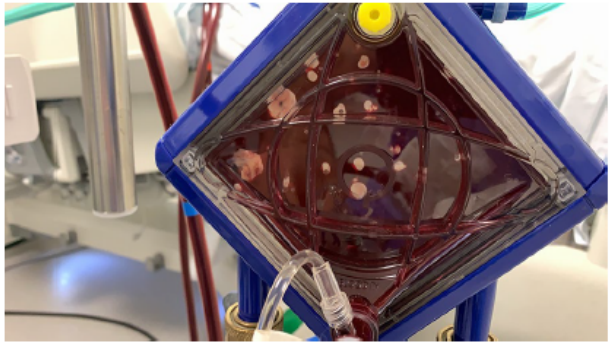


Critical Care (2024) 28:158

All that glitters is not gold: an unusual presentation of *S. aureus* sepsis during ECMO

José Augusto Santos Pellegrini*, Patrícia Schwarz, Édino Parolo and Ricardo Viegas Cremonese

A 53-year-old male was submitted to veno-venous extracorporeal membrane oxygenation (ECMO) due to coronavirus disease 2019 (COVID-19) pneumonia for 84 days, without relevant complications related to the circuit itself until an urgent return cannula change was needed due to the rigid connector fracture with major bleeding. The cannula was promptly switched from the right to the left internal jugular vein. Two days after, the patient presented clinical and biochemical features of sepsis. Vancomycin was started and posteriorly switched to oxacillin, since blood cultures were positive for methicillin-sensitive *Staphylococcus aureus*. The day after, the new oxygenator presented numerous round coalescent abscesses through the venous side. As the signs of sepsis still persisted, we decided to wean the patient off ECMO. We then identified also an abscess stuck to the head of the rotational pump. Blood samples collected from the venous port of the membrane and from the pump were both positive for *S. aureus*. The patient ultimately died from septic shock 5 days after being decannulated.



Venous side of the ECMO oxygenator showing multiple rounded, yellowish images compatible with abscesses

Compliance with ethical standards

Conflicts of interest

We declare no competing interests.

En résumé

- Les infections sous ECMO sont fréquentes
  - PAVM > Bactériémie > infection site canulation
- Pathogènes responsables
  - PAVM: pas de particularité
  - Bactériémie et infection site de canulation
    - Enterocoque
    - Staph coag neg
    - Entérobactéries
- Impact ++ sur la mortalité

FACTEURS DE RISQUE

Risk factors for nosocomial infection during extracorporeal membrane oxygenation

M.-S. Hsu [a], K.-M. Chiu [b], Y.-T. Huang [a], K.-L. Kao [c], S.-H. Chu [b], C.-H. Liao [a,*]

Journal of Hospital Infection (2009) 73, 210–216

Table III Univariate and multivariate analysis of risk factors of nosocomial infections during ECMO use

Factors	Univariate analysis			Multivariate analysis		
	OR	95% CI	*P*-value	OR	95% CI	*P*-value
Age	0.97	0.92–1.01				
Glycopeptides	0.28	0.08–1.07	0.066	0.232	0.05–1.10	0.066
Duration of ECMO (days)	1.12	1.04–1.22	0.004	1.146	1.04–1.07	0.007
Duration of ICU stay (days)	1.03	1.01–1.06	0.023	0.992	0.94–1.05	0.776

ECMO, extracorporeal membrane oxygenation; OR, odds ratio; CI, confidence interval; ICU, intensive care unit.

Infections Acquired by Adults Who Receive Extracorporeal Membrane Oxygenation: Risk Factors and Outcome

Cecile Aubron, MD;[1,2] Allen C. Cheng, PhD;[3,4] David Pilcher, MD;[1,2] Tim Leong, MD;[1,4] Geoff Magrin, BAppSci;[5] D. Jamie Cooper, MD;[1,2] Carlos Scheinkestel, MD;[1,4] Vince Pellegrino, MD[1,4]

TABLE 2. Comparison between Patients with and Patients without Bloodstream Infection (BSI)

Variable	BSI (n = 21)	No BSI (n = 125)	P
Age, years	48 (33–56)	46 (32–56)	.989
APACHE II score	23 (13–27)	19 (14–24)	.413
Duration of ICU stay before initiation of ECMO, days	1 (0–4)	0 (0–2)	.180
Immunosuppression	11 (52.4)	53 (42)	.478
Type of ECMO			>.99
VV	7 (33.3)	43 (34.4)	
VA	14 (66.7)	82 (65.6)	
Subtype of VA ECMO			.772
Central	7 (33)	35 (28)	
Peripheral	7 (33)	82 (65)	
Duration of ECMO, days	12 (7–22)	8 (6–11)	.0004
Illness severity at ECMO initiation			
SOFA	13 (11–16)	12 (10–13)	.038
PaO_2:FiO_2 (for VV ECMO), mmHg	76 (70–100)	75 (60–95.5)	.456
Plasma lactate level (for VA ECMO), mmol/L	6 (3.6–8.5)	6.4 (3–10.4)	.648
RRT associated	16 (79.2)	67 (53.6)	.06
Bleeding			
Surgery associated	7 (33.3)	32 (25.6)	.438
Total units of RBC transfused	22 (15–28)	12 (6–23)	.0092
RBC units per day of ECMO	1.6 (0.7–2.3)	1.7 (0.8–2.6)	.874
ICU LOS after ECMO weaning	17 (12–19)	10 (3–19)	.0241
Hospital LOS after ECMO weaning	34 (18–49)	21.5 (7–41)	.0845
In-hospital mortality	9 (42.7)	41 (32.8)	.457

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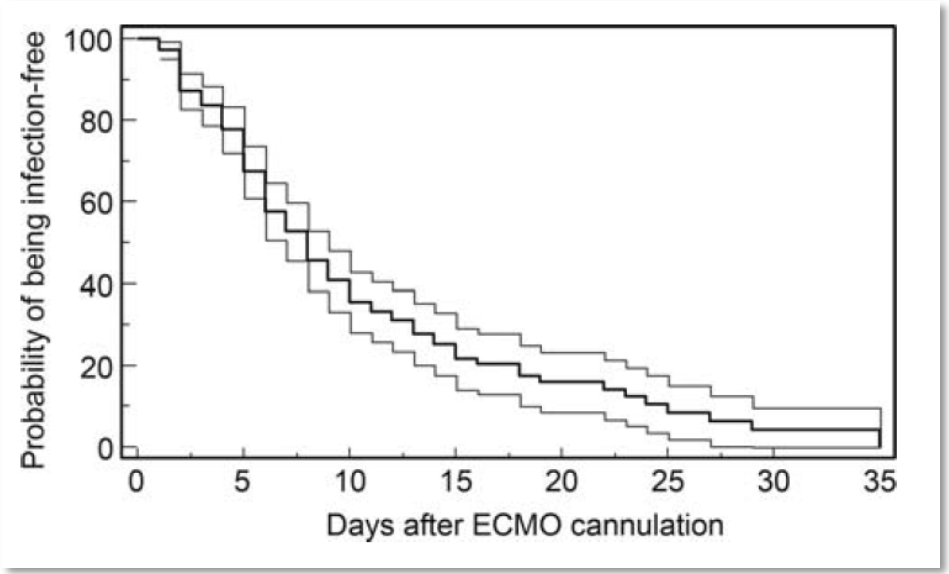
Clinical infectious disease 2012



COMMENT DIAGNOSTIQUER ?

Signes d’appel peu sensibles et peu spécifiques

Signes généraux

- La surveillance de la température corporelle n’est pas contributive
- Les « marqueurs » biologiques d’inflammation/ infection sont souvent pris en défaut (↗ CRP, PCT, GB non spécifiques sous ECMO)
- Idem pour l’oxygénation
- Instabilité hémodynamique +++

Signes locaux

- Radio de thorax pas ou peu contributive
- Infection de canule
  - Inflammation orifice canulation +++
  - Ecoulement purulent +++
- PAVM
  - Sécrétions trachéales purulentes +++

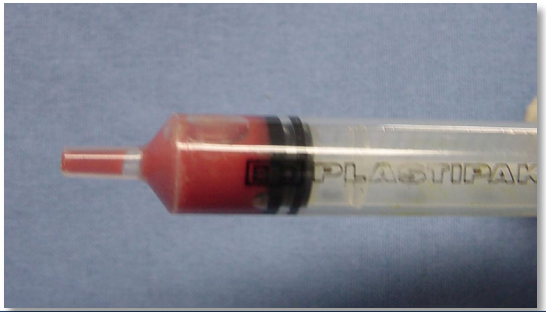
Quand suspecter?

- Il faut avoir un niveau de suspicion d'infection bas
- Utiliser signes « locaux » et cinétique des marqueurs inflammatoires (GB)
- Ne pas hésiter à « prélever au moindre doute »
  - Toute instabilité hémodynamique est potentiellement d'origine septique
- En faisant attention à ne pas prélever pour rien >>> risque de faux positifs (colonisation vs. infection)

Comment diagnostiquer?

Prélèvements bactériologiques

- Hémocultures
- Prélèvement local (le long des canules)
- Pour les PAVM, je ne vais pas vous apprendre votre métier..



COMMENT TRAITER / AMÉLIORER LE TRAITEMENT ?

Traitement probabiliste

PAVM

Management of Adults With Hospital-acquired and Ventilator-associated Pneumonia: 2016 Clinical Practice Guidelines by the Infectious Diseases Society of America and the American Thoracic Society

Clinical Infectious Diseases® 2016;63(5):575–82

International ERS/ESICM/ESCMID/ALAT guidelines for the management of hospital-acquired pneumonia and ventilator-associated pneumonia

Eur Respir J 2017; 50: 1700582

SFAR

srlf SOCIÉTÉ DE RÉANIMATION DE LANGUE FRANÇAISE

Recommandations formalisées d'experts

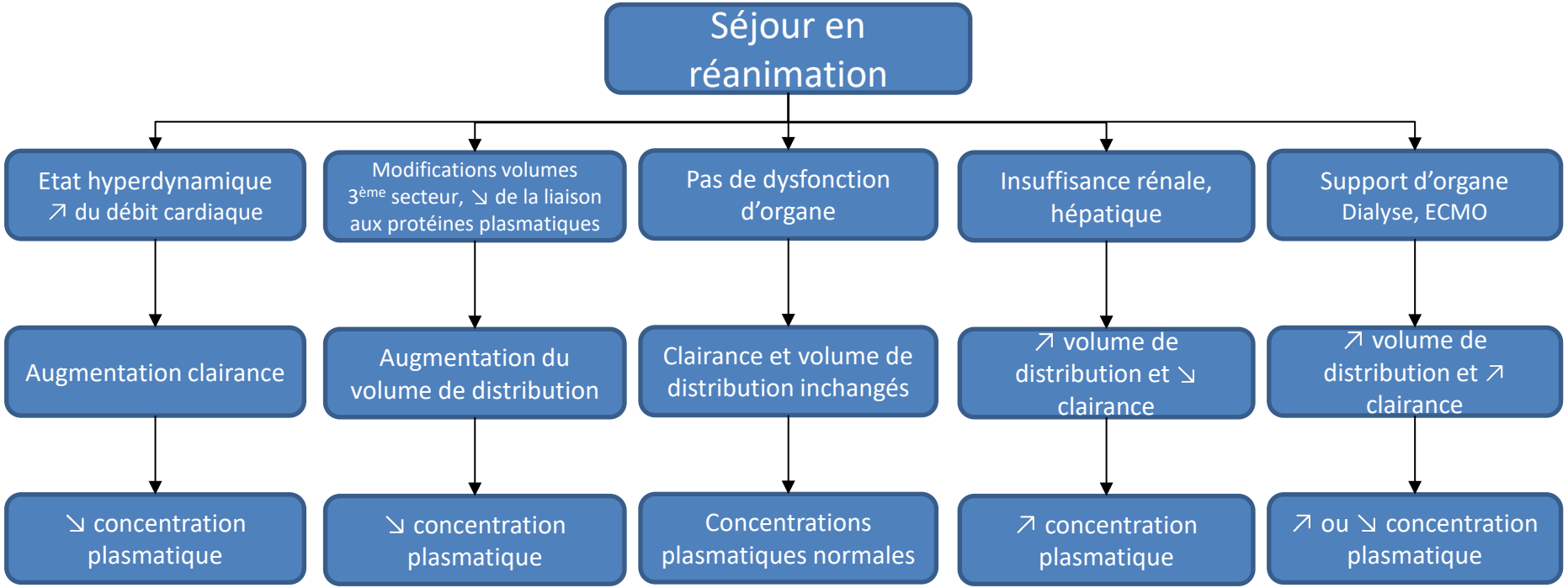
PNEUMONIES ASSOCIÉES AUX SOINS DE RÉANIMATION

RFE commune SFAR – SRLF
Société Française d'Anesthésie et de Réanimation
Société de Réanimation de Langue Française

Infection site de canulation

- Antibiothérapie anti Gram + et Gram –
  - Glycopeptide ou daptomycine
  - + β-lactamine à large spectre (pipera/tazo)
- Intérêt céphalosporines « anti SARM »? (ceftobiprole)

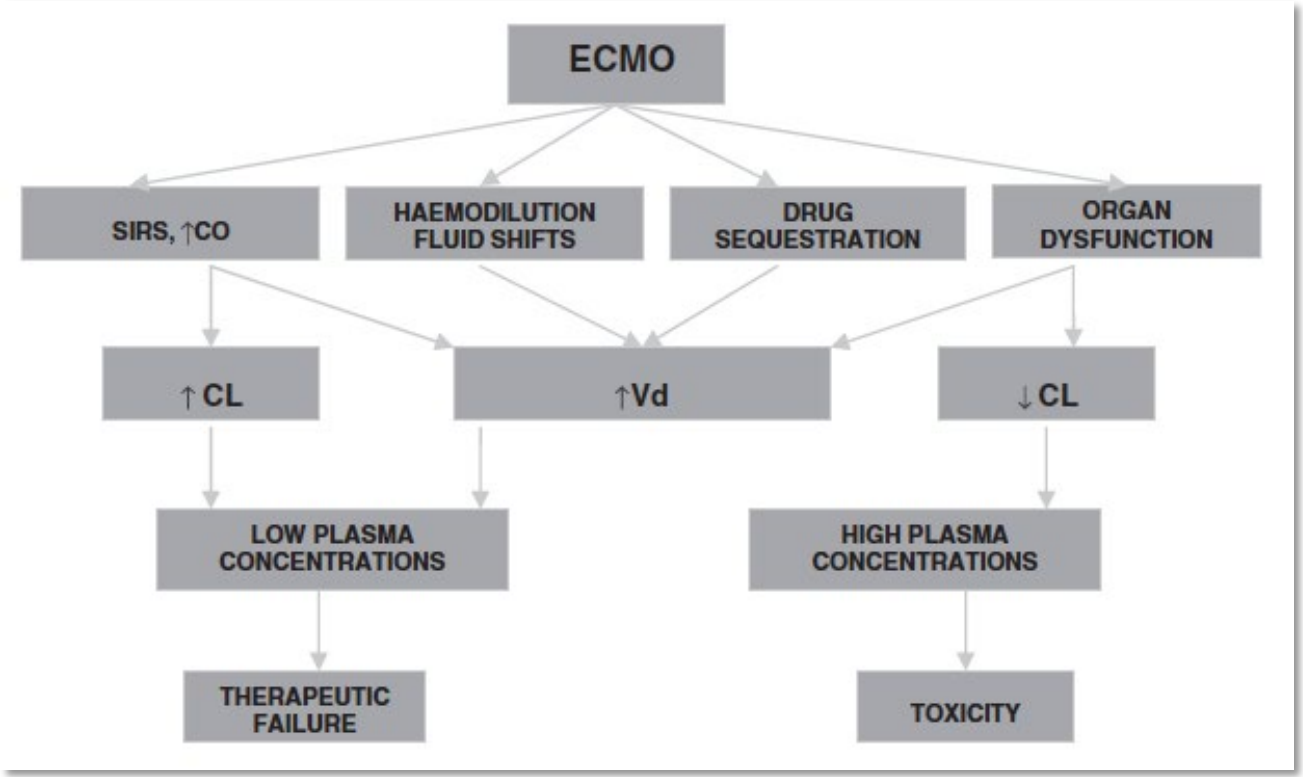
Variations observées en réanimation



Pharmacokinetic changes in patients receiving extracorporeal membrane oxygenation☆

Kiran Shekar FCICM[a,*], John F. Fraser PhD[a], Maree T. Smith PhD[b], Jason A. Roberts PhD[c]

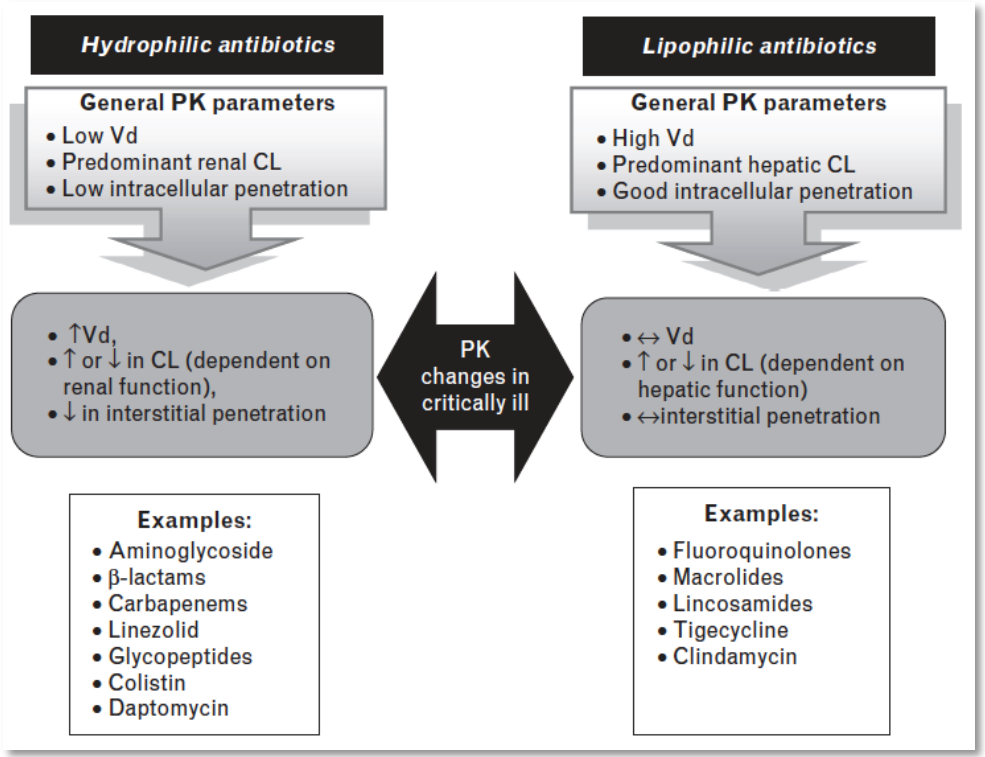
Journal of Critical Care (2012)



Improving antibiotic dosing in special situations in the ICU: burns, renal replacement therapy and extracorporeal membrane oxygenation

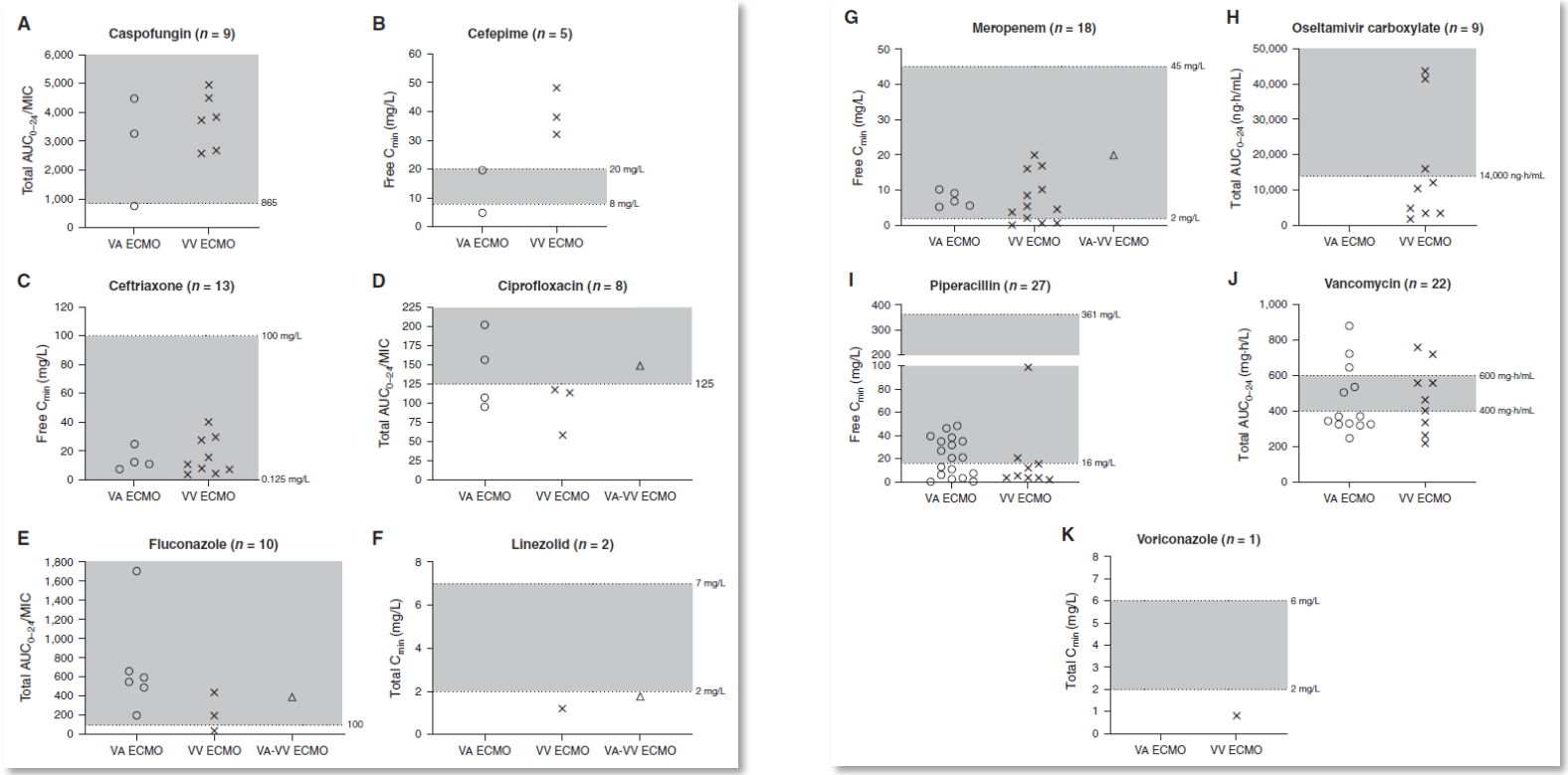
Janattul-Ain Jamal[a], *Caleb J.P. Economou*[a], *Jeffrey Lipman*[a,b], *and Jason A. Roberts*[a,b,c]

Curr Opin Crit Care 2012, 18:460–471



Antimicrobial Exposures in Critically Ill Patients Receiving Extracorporeal Membrane Oxygenation

Kiran Shekar[1,2,3,4*], Mohd H. Abdul-Aziz[5*], Vesa Cheng[5], Fay Burrows[6], Hergen Buscher[7,8], Young-Jae Cho[9], Amanda Corley[1,10], Arne Diehl[11,12], Eileen Gilder[13], Stephan M. Jakob[14], Hyung-Sook Kim[15], Bianca J. Levkovich[16], Sung Yoon Lim[9], Shay McGuinness[17], Rachael Parke[18,19], Vincent Pellegrino[11,12], Yok-Ai Que[14], Claire Reynolds[7], Sam Rudham[7], Steven C. Wallis[5], Susan A. Welch[6], David Zacharias[14], John F. Fraser[1,2,3,4], and Jason A. Roberts[5,18,19]



Nouvelles β-lactamines: pas de modification PK sous ECMO

Pharmacokinetics/pharmacodynamics of ceftobiprole in patients on extracorporeal membrane oxygenation

Alexandre Coppens[a], Noël Zahr[b], Juliette Chommeloux[a], Alexandre Bleibtreu[c], Guillaume Hekimian[a], Marc Pineton de Chambrun[a], Lucie LeFevre[a], Matthieu Schmidt[a,d], Jérôme Robert[e], Helga Junot[f], Alain Combes[a,d], Charles-Edouard Luyt[a,d,*]

International Journal of Antimicrobial Agents 61 (2023) 106765

Volume 79, Issue 5
May 2024

JOURNAL ARTICLE

Ceftazidime/avibactam serum concentration in patients on ECMO Get access >

Anaïs Curtiaud, Matthieu Petit, Juliette Chommeloux, Marc Pineton de Chambrun, Guillaume Hekimian, Matthieu Schmidt, Alain Combes, Charles-Edouard Luyt

Journal of Antimicrobial Chemotherapy, Volume 79, Issue 5, May 2024, Pages 1182–1186,
https://doi.org/10.1093/jac/dkae091
Published: 28 March 2024 **Article history** ▾

Cefiderocol pharmacokinetics in critically ill patients undergoing ECMO support

María Marín-Cerezuela[1], Ruben Martín-Latorre[2], Juan Frasquet[3], Jesus Ruiz-Ramos[4], Sandra Garcia-Contreras[1], Mónica Gordón[2], María Jesús Broch[2], Álvaro Castellanos-Ortega[2] and Paula Ramirez[2]*

Critical Care (2024) 28:337

Antibiothérapie sous ECMO

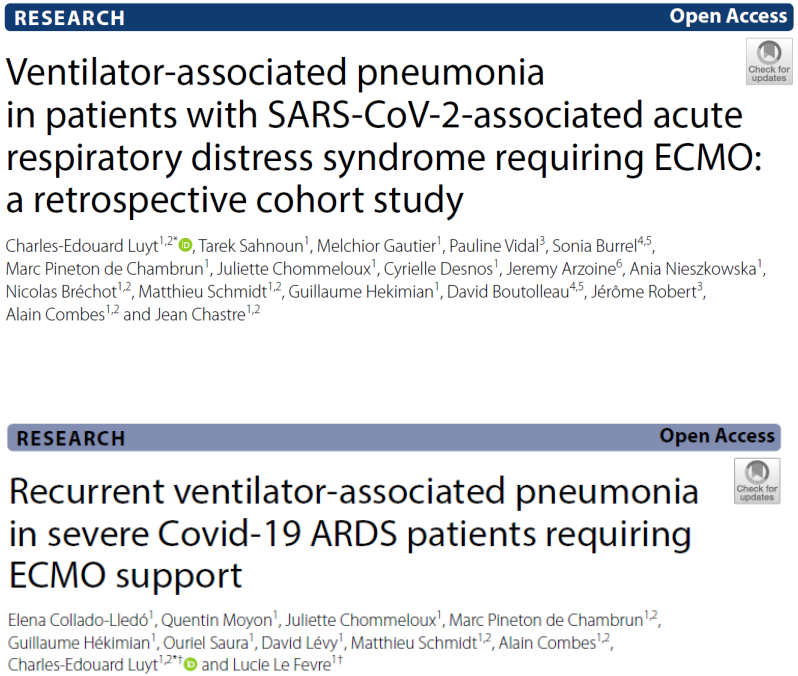
- Variabilité
  - inter-individuelle (défaillances d'organes)
  - Intra-individuelle (en fonction du temps)
- Surveillance des taux sanguins des médicaments anti-infectieux sous ECMO est cruciale, surtout en cas de suspicion d'échec de traitement

- Beta-lactamines: doses « habituelles »
- Linézolide: attention au sous dosage
- Aminosides: augmentation des posologies, surtout si bilan hydrique positif et BMI élevé

PAVM: quelle durée de traitement?

Peu de données dans la littérature

- Pas de modification de la durée de traitement pour les malades sous ECMO (VV ou VA)



RESEARCH Open Access

Ventilator-associated pneumonia in patients with SARS-CoV-2-associated acute respiratory distress syndrome requiring ECMO: a retrospective cohort study

Charles-Edouard Luyt[1,2*], Tarek Sahnoun[1], Melchior Gautier[1], Pauline Vidal[3], Sonia Burrel[4,5], Marc Pineton de Chambrun[1], Juliette Chommeloux[1], Cyrielle Desnos[1], Jeremy Arzoine[6], Ania Nieszkowska[1], Nicolas Bréchot[1,2], Matthieu Schmidt[1,2], Guillaume Hekimian[1], David Boutolleau[4,5], Jérôme Robert[3], Alain Combes[1,2] and Jean Chastre[1,2]

RESEARCH Open Access

Recurrent ventilator-associated pneumonia in severe Covid-19 ARDS patients requiring ECMO support

Elena Collado-Lledó[1], Quentin Moyon[1], Juliette Chommeloux[1], Marc Pineton de Chambrun[1,2], Guillaume Hékimian[1], Ouriel Saura[1], David Lévy[1], Matthieu Schmidt[1,2], Alain Combes[1,2], Charles-Edouard Luyt[1,2*†] and Lucie Le Fevre[1†]

RESEARCH Open Access

Recurrent ventilator-associated pneumonia in severe Covid-19 ARDS patients requiring ECMO support

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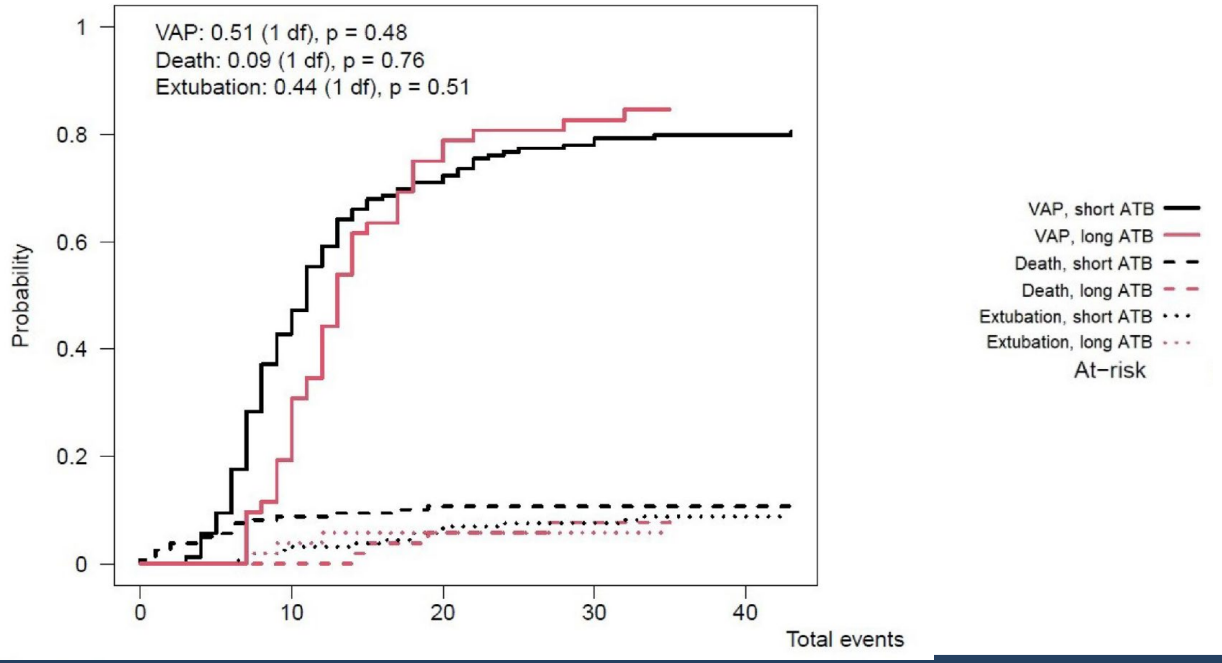


Bactériémie: quelle durée de traitement?

- Analyse rétrospective de 182 bactériémies « primaires » sous ECMO dans 12 centres européens
- SAPS II admission, choc septique et canulation chirurgicale associés à la mortalité, pas la durée de traitement (≤8 j vs. >8j).

Massart et al., soumis

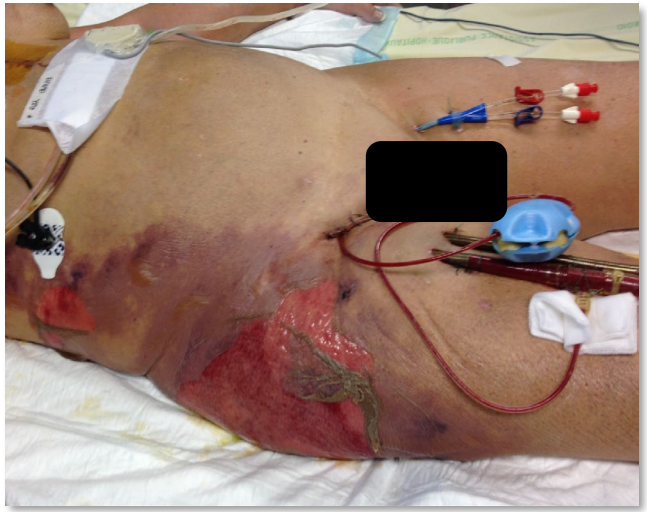
Infection de canule: quelle durée de traitement?

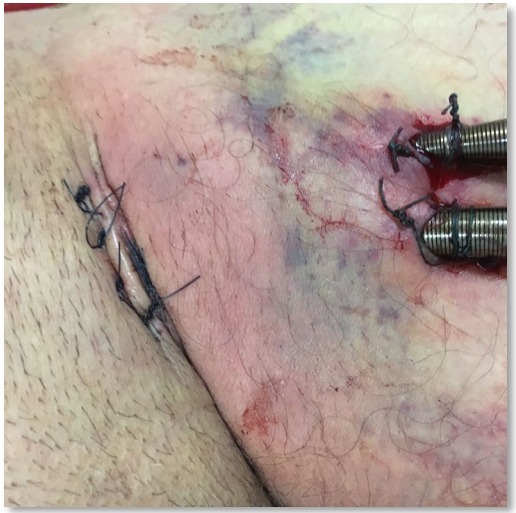
- Analyse rétrospective de 109 infections de canule dans 12 centres européens
- Rechute de l'infection: 14%
  - Principal facteur de risque: durée d'ECMO
- Patients avec une durée d'antibiothérapie ≤8 j avaient un taux de rechute et une mortalité identiques aux patients avec une durée prolongée (>8 j) d'antibiotiques

Ortuno et al. soumis

Quand changer de site de cannulation ?

- Cellulite/fasciite





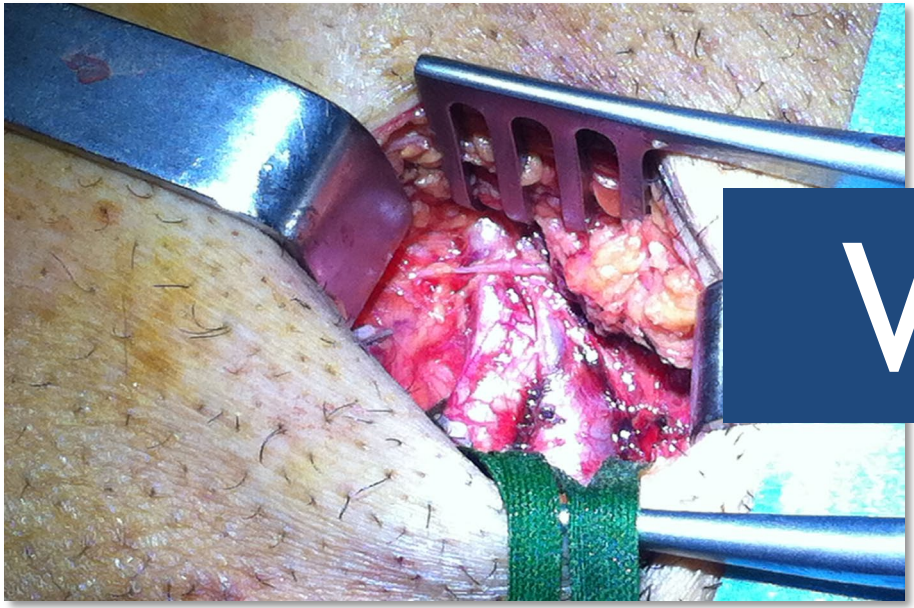
- Echec du traitement

En résumé, traitement

- Attention au sur- et sous- dosage d'antibiotique
  - Ne pas hésiter à faire des dosages
- Durée de traitement habituelles
  - PAVM : 8 jours
  - Bactériémie : 8 j (sauf *S. aureus*… SCN?)
  - Infection site de canulation: 8 jours

PREVENTION

Canulation percutanée ou chirurgicale ?



VS

Percutaneous versus surgical femoro-femoral veno-arterial ECMO: a propensity score matched study

Pichoy Danial[1], David Hajage[2], Lee S. Nguyen[1], Ciro Mastroianni[1], Pierre Demondion[1], Matthieu Schmidt[3], Adrien Bouglé[4], Julien Amour[4], Pascal Leprince[1], Alain Combes[3] and Guillaume Lebreton[1*]

Intensive Care Med 2018

Table 2 VA-ECMO-related outcomes in the propensity matched population

	Surgical group $n = 266$ (%)	Percutaneous group $n = 266$ (%)	*p* value
30-Day overall survival	150 (56.3)	170 (63.8)	0.034
Cannulation site infection	74 (27.8)	44 (16.5)	0.001
Infection requiring surgical revision[a]	40 (15.0)	14 (5.3)	< 0.001
Vascular complications at cannulation[b]	7 (2.6)	10 (3.8)	0.663
Limb ischemia	33 (12.4)	23 (8.6)	0.347
Cannula relocation or removal	25 (9.4)	15 (5.6)	0.258
Limb fasciotomy	10 (3.8)	6 (2.3)	0.310
Amputation	2 (0.8)	2 (0.8)	1.000
Vascular complications after cannula removal	9 (3.4)	39 (14.7)	< 0.001
Surgical revision for persistent bleeding early after decannulation	4 (1.5)	25 (9.4)	< 0.001
Surgical revision in the days after decannulation[c]	5 (1.9)	14 (5.3)	0.035
Lower limb sensory-motor deficit	6 (2.3)	7 (2.6)	0.779

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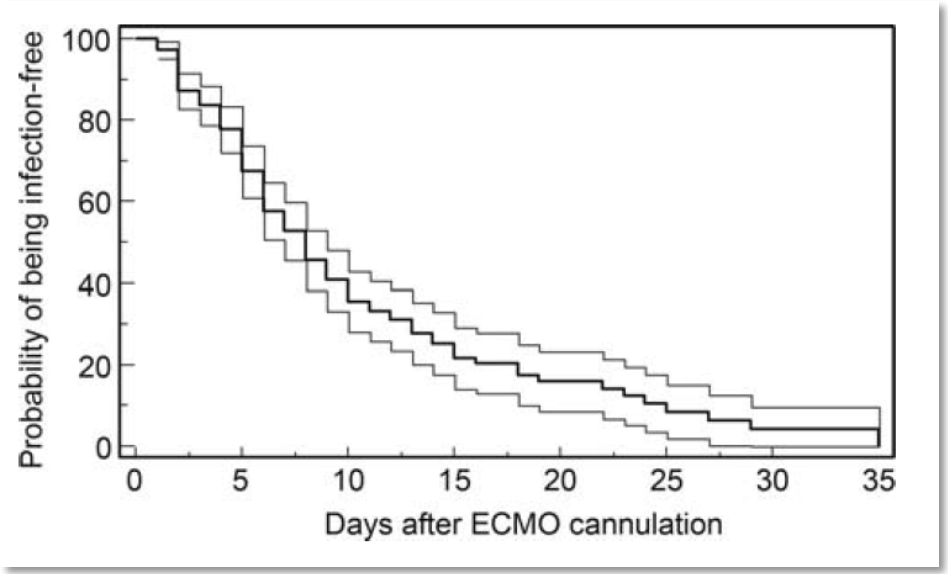
Table 3 Univariable and multivariable analyzes of factors associated with local infection

Variables	Univariable analysis		Multivariable analysis	
	OR (95% CI)	*p* value	OR (95% CI)	*p* value
Percutaneous approach	0.46 (0.32–0.66)	< 0.001	0.40 [0.27–0.59]	< 0.001
Chronic heart failure	1.86 (1.33–2.62)	< 0.001	1.55 [1.08–2.23]	0.018
Duration of VA-ECMO		< 0.001		< 0.001
< 3 days	1		1	
≥ 3 and < 6 days	4.92 (2.50–10.61)		4.25 (1.99–9.1)	
≥ 6 and < 10 days	8.92 (4.59–19.12)		8.14 (3.84–17.25)	
≥ 10 days	11.48 (5.95–24.46)		10.03 (4.77–21.10)	
Reperfusion	10.19 (2.17–181.78)	0.005	–	–
SOFA score	0.95 (0.91–0.98)	0.003	–	NS
VA-ECMO implanted under cardiopulmonary resuscitation	0.45 (0.27–0.78)	0.006	–	NS

Nosocomial Infections in Adult Cardiogenic Shock Patients Supported by Venoarterial Extracorporeal Membrane Oxygenation

Matthieu Schmidt,[1] Nicolas Bréchot,[1] Sarah Hariri,[2] Marguerite Guiguet,[4] Charles Edouard Luyt,[1] Ralouka Makri,[2] Pascal Leprince,[3] Jean-Louis Trouillet,[1] Alain Pavie,[3] Jean Chastre,[1] and Alain Combes[1]

Clinical infectious disease 2012



Retirer l'ECMO le plus rapidement possible…

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Clinical infectious disease 2012

Factors associated with first Nosocomial Infection on ECMO

	Univariate Analysis		Multivariate Analysis	
Factor	HR (95% CI)	*P* Value	HR (95% CI)	*P* Value
SAPS II score[a]	1.01 (.99–1.02)	.09		
SOFA score[a]	1.05 (1.01–1.09)	.03	1.04 (1.00–1.08)	.05
Immunosuppression[b]	1.14 (.81–1.62)	.46		
Reason for ECMO		.38		
Miscellaneous[c]	1			
Myocarditis	0.84 (.49–1.44)			
Post–cardiac surgery	1.20 (.84–1.71)			
Location of ECMO cannulation		.09		.07
Mobile unit	1		1	
Operating room	1.10 (.70–1.74)		1.16 (.71–1.89)	
ICU	0.59 (.35–1.01)		0.64 (.37–1.10)	
Site of ECMO cannulation		.85		
Intrathoracic only	1			
Extrathoracic only	0.90 (.60–1.36)			
Extrathoracic then intrathoracic	0.99 (.65–1.51)			
Antibiotics at the time of ECMO[d]	1.07 (.76–1.51)	.68	0.73 (.50–1.05)	.09

Risk factors for nosocomial infection during extracorporeal membrane oxygenation

M.-S. Hsu [a], K.-M. Chiu [b], Y.-T. Huang [a], K.-L. Kao [c], S.-H. Chu [b], C.-H. Liao [a,*]

Journal of Hospital Infection (2009)

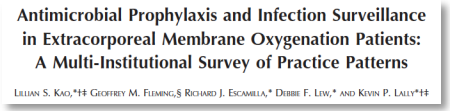
- >75% received antibiotics with glycopeptides or anti-Pseudomonas agents at the time of ECMO insertion

Table III Univariate and multivariate analysis of risk factors of nosocomial infections during ECMO use

Factors	Univariate analysis			Multivariate analysis		
	OR	95% CI	*P*-value	OR	95% CI	*P*-value
Age	0.97	0.92–1.01				
Glycopeptides	0.28	0.08–1.07	0.066	0.232	0.05–1.10	0.066
Duration of ECMO (days)	1.12	1.04–1.22	0.004	1.146	1.04–1.07	0.007
Duration of ICU stay (days)	1.03	1.01–1.06	0.023	0.992	0.94–1.05	0.776

- Most infections at the cannula insertion site occurred >10 days following ECMO initiation.

Antibioprophylaxie


Antimicrobial Prophylaxis and Infection Surveillance in Extracorporeal Membrane Oxygenation Patients: A Multi-Institutional Survey of Practice Patterns

Lillian S. Kao,*†‡ Geoffrey M. Fleming,§ Richard J. Escamilla,* Debbie F. Lew,* and Kevin P. Lally*†‡

ASAIO Journal 2011

- 80% des centres pratiquent une antibioprophylaxie (canulation +/- après)
- Mais plus de questions que de réponses
  - Quel(s) antibiotique(s)?
  - Quelle durée?
  - Impact sur émergence BMR?

Multiple-site decontamination to prevent acquired infection in patients with veno-venous ECMO support

Nicolas Massart[1*†], Christophe Camus[2†], Nicolas Nesseler[3,4], Pierre Fillâtre[1], Erwan Flecher[5], Alexandre Mansour[3,4], Jean-Philippe Verhoye[5], Lucie Le Fevre[6†] and Charles-Edouard Luyt[6,7†]

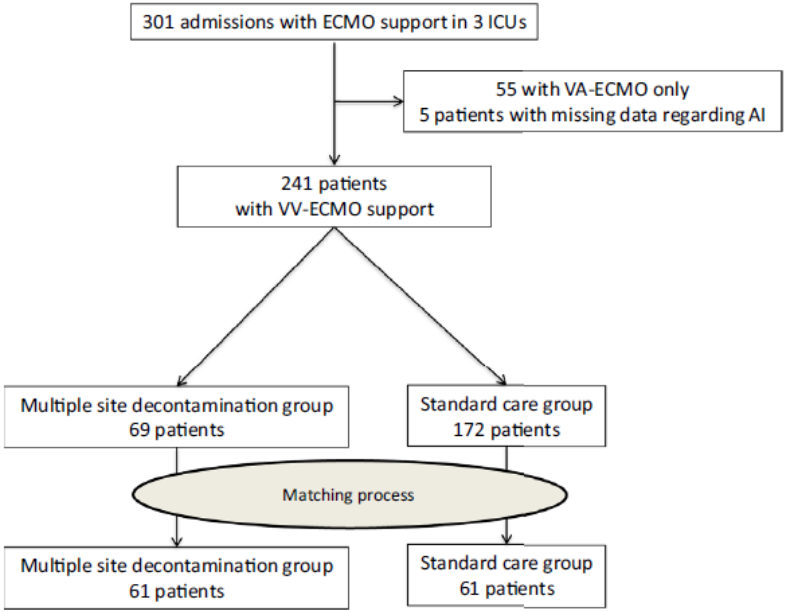


Fig. 1 Flowchart

DMS:

- ATB topique oropharynx et SNG x4/j
- Mupirocine nasale 5 j
- Bain chlorhex x 1/j

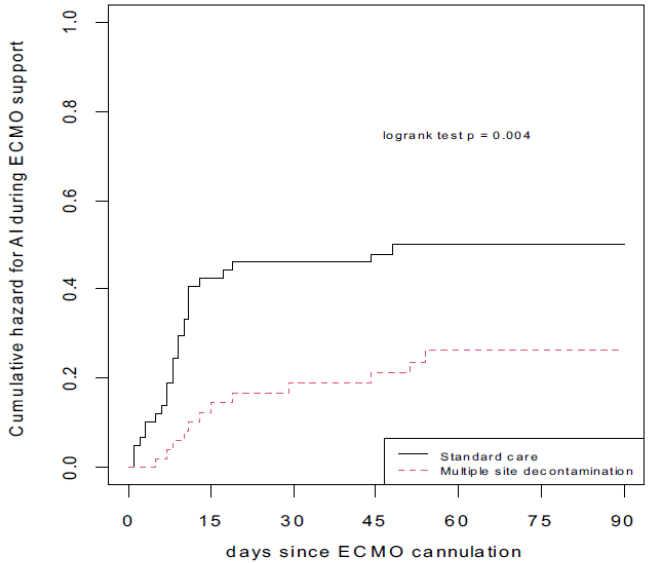
	SOC N= 172	DMS N = 69
PAVM		
n	104	12
Incidence 1,000 ECMO/j	43.7	10.3
Bactériémie		
n	39	7
Incidence 1,000 ECMO/j	16.4	6.0

Régression (modèle de Poisson): DMS associée à une incidence plus faible d'infection (IRR 0.42, IC 95% 0.23-0.6; p <0,001)

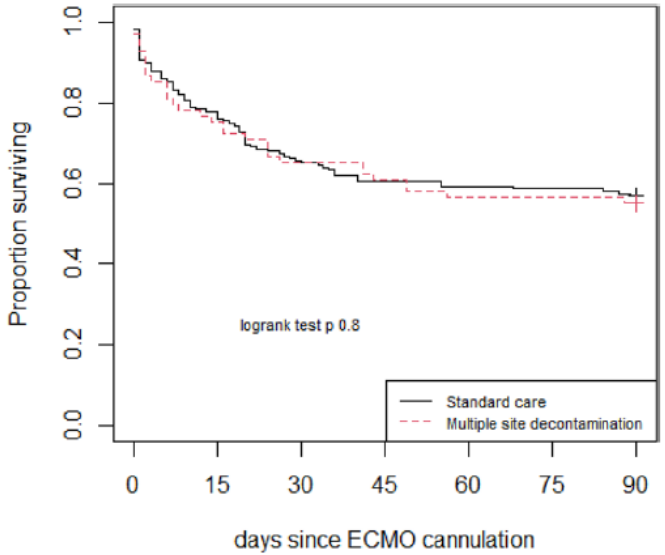
Multiple-site decontamination to prevent acquired infection in patients with veno-venous ECMO support

Massart *et al. Annals of Intensive Care* (2023) 13:27

Nicolas Massart[1*†], Christophe Camus[2†], Nicolas Nesseler[3,4], Pierre Fillâtre[1], Erwan Flecher[5], Alexandre Mansour[3,4], Jean-Philippe Verhoye[5], Lucie Le Fevre[6†] and Charles-Edouard Luyt[6,7†]



nb at risk							
Multiple site decontamination	61	25	13	5	2	1	1
Standard care	61	28	11	4	2	2	1



nb at risk							
Multiple site decontamination	69	42	23	12	5	3	1
Standard care	172	80	32	13	7	2	1

Chlorhexidine-Impregnated Sponges and Less Frequent Dressing Changes for Prevention of Catheter-Related Infections in Critically Ill Adults

A Randomized Controlled Trial

Jean-François Timsit,
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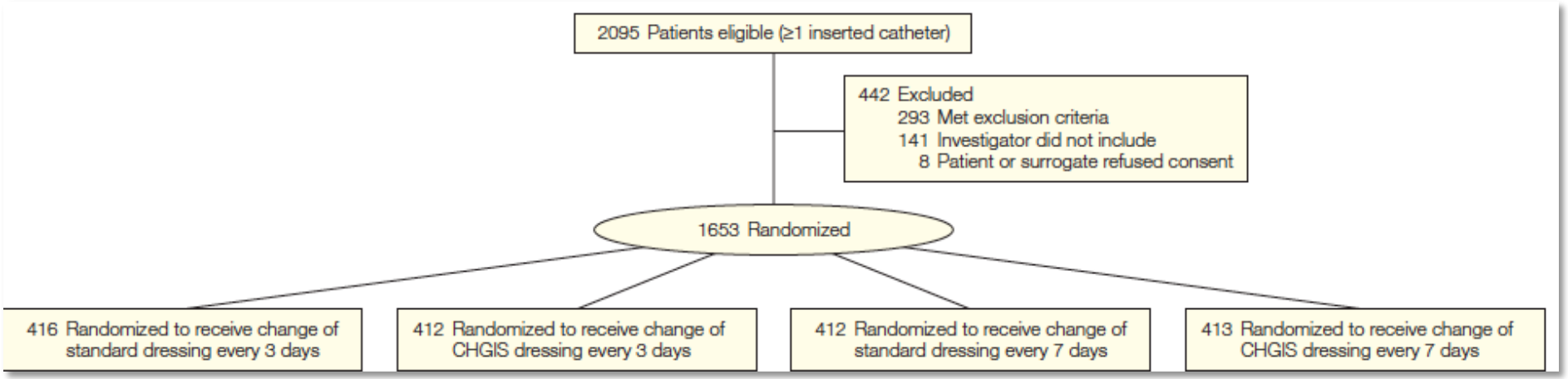
JAMA, March 25, 2009-



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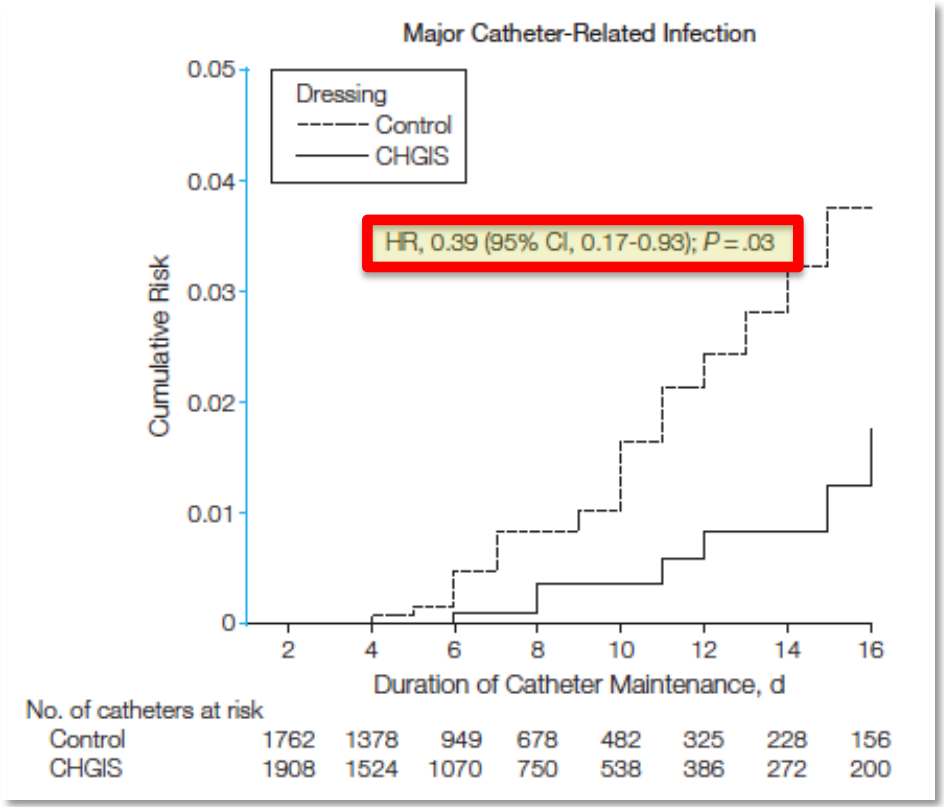

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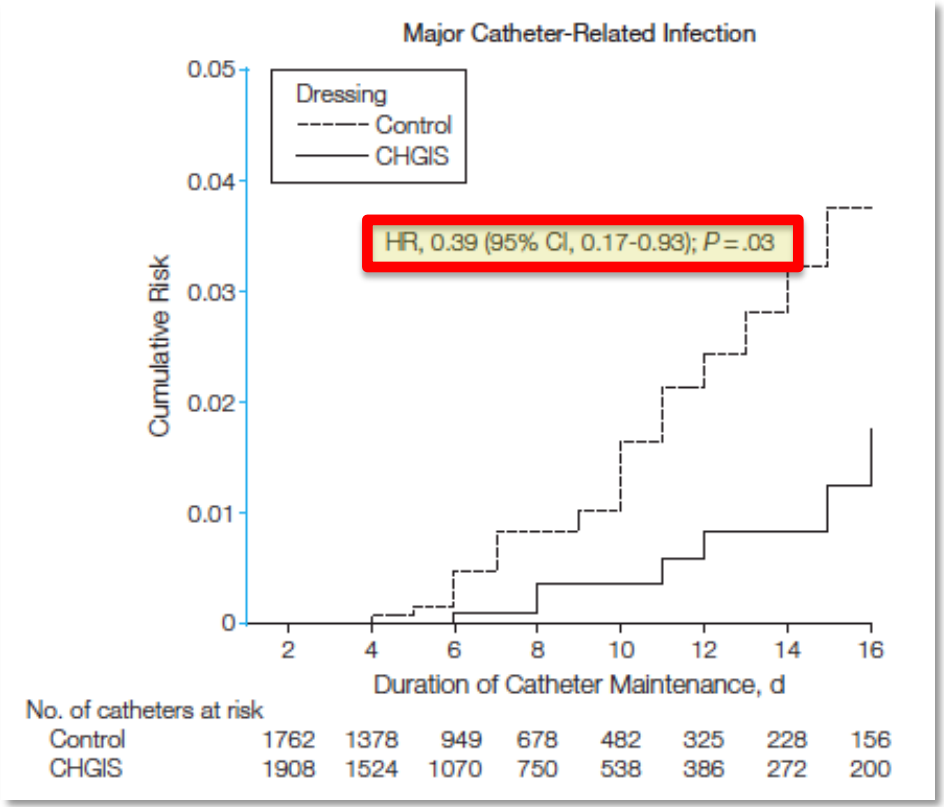

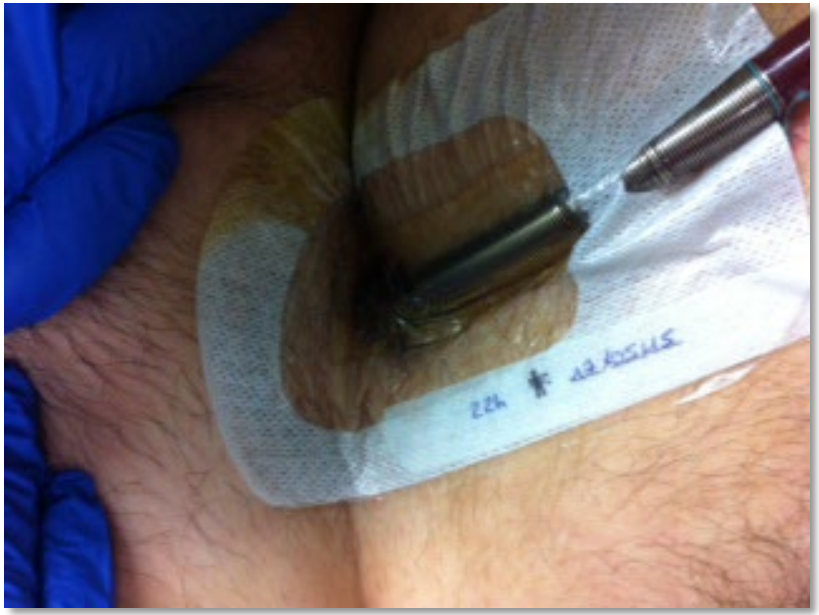

Prévention: en résumé

Ce qui est sûr

- Retirer l'ECMO le plus vite possible
- Canulation percutanée (vs. chirurgicale)
- (Pour les VAP, cf. prévention des VAP)

Ce qui ne l'est pas

- Antibioprophylaxie à la pose
  - Durée, molécule…
  - Intérêt si canulation percutanée
- Utilisation pansements imprégnés chlorhexidine
- Utilisation décontamination multisite

Conclusion

- Les infections sous ECMO sont fréquentes et associées à une surmortalité
- Importance +++ du diagnostic et traitement précoces
- PAVM sont les plus fréquentes
  - Pas de particularité de prise en charge
- Bactériémies
  - Pas de particularité de prise en charge

Conclusion (suite)

- Infections du site de canulation
  - Souvent polymicrobiennes et associées à une bactériémie
  - Monothérapie pendant 8 j: pronostic identique à bithérapie et durée plus longue
- Prévention +++ cruciale