DES de Néphrologie : Enseignement l'Option SOINS INTENSIFS en NÉPHROLOGIE

Réflexions sur la prise en charge d'un sepsis chez un patient dialysé chronique en USIN

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1

QCM plusieurs choix possibles

1)Les infections sont la première cause de décès clairement identifié en 2020

2) La mesure de la procalcitonine n'a pas d'intérêt car elle s'élève toujours en cas d'IRC

3) La mortalité de cause cardiaque est fréquente au cours des pneumonies du dialysé

4) L'incidence de bactériémie sur cathéter tunnelisé est plus de 10 fois supérieure à celle observée sur FAV

5) La gentamicine est recommandée en première intention dans les endocardites à SA sur valve native

6) Le traitement empirique d'une péritonite en dialyse péritonéale se focalise sur les cocci G+

2

Décès en dialyse : extrait du rapport REIN

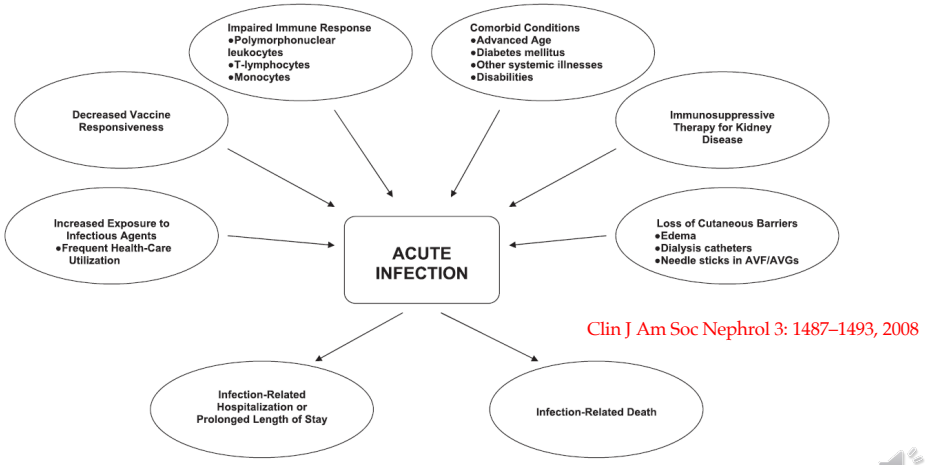
Tableau 1
Distribution des causes de décès des patients traités (dialysés ou greffés).

Cause principale de décès	2019		2020	
	n	%	*n*	%
Maladies de l'appareil circulatoire	1 810	19,6	1 651	16,7
Infarctus du myocarde	199	2,2	189	1,9
Autres cardiopathies ischémiques	114	1,2	98	1,0
Cardiopathie hypertensive	13	0,1	9	0,1
Insuffisance cardiaque	452	4,9	394	4,0
Troubles du rythme	97	1,1	84	0,9
Maladies cérébrovasculaires	316	3,4	332	3,4
Embolie pulmonaire	17	0,2	18	0,2
Autres maladies de l'appareil circulatoire	602	6,5	527	5,3
Maladies rénales	76	0,8	93	0,9
Cancer	942	10,2	905	9,2
Diabète	10	0,1	7	0,1
Maladies infectieuses	1 321	14,3	2 109	21,4
Cachexie	816	8,8	761	7,7
Hyperkaliémie	53	0,6	60	0,6
Maladies du foie	53	0,6	44	0,4
Mort rapide ou inattendue, choc sans précision	859	9,3	778	7,9
Cause inconnue	2 017	21,8	2 168	22,0
Autres causes connues	1 278	13,8	1 282	13,0

NB : 2 % de données manquantes ou non agrégées.

Néphrologie & Thérapeutique 18 (2022) 18/5S-e25–18/5S-e29

3



Clin J Am Soc Nephrol 3: 1487–1493, 2008

Risk factors and outcomes of infection in kidney disease. AVF, arteriovenous fistula; AVG, arteriovenous graft.

4

	1992* Sepsis Consensus Definitions Conference[1]	**2003*** Sepsis Consensus Definitions Conference[2]	**2016*** Sepsis Consensus Definitions Conference[3]
Infection without systemic inflammation	Infection	Infection	Infection
Infection with systemic inflammation without organ dysfunction	Sepsis**	Sepsis***	Infection
Infection with systemic inflammation and presence of organ dysfunction	Severe sepsis	Severe sepsis	Sepsis
Infection-induced hypotension not responding to fluid administration and requiring vasopressors	Septic shock	Septic shock	Septic shock****

* Date of publication
** SIRS criteria were the only criteria for systemic inflammation
*** Added to SIRS criteria several other general, hemodynamic, inflammatory, organ dysfunction, and tissue hypoperfusion variables which, if abnormal, might support systemic inflammation
**** Also requires an elevated lactate

[1]1992 publication (Bone *et al.*)
[2]2003 publication (Levy *et al.*)
[3]2016 publication (Singer *et al.*)

CJASN 17: 880–889, Ju… 2022

5

Table 1. Sequential [Sepsis-Related] Organ Failure Assessment Score[a]

	Score				
System	0	1	2	3	4
Respiration					
Pao_2/Fio_2, mm Hg (kPa)	≥400 (53.3)	<400 (53.3)	<300 (40)	<200 (26.7) with respiratory support	<100 (13.3) with respiratory support
Coagulation					
Platelets, $\times 10^3/\mu L$	≥150	<150	<100	<50	<20
Liver					
Bilirubin, mg/dL (μmol/L)	<1.2 (20)	1.2-1.9 (20-32)	2.0-5.9 (33-101)	6.0-11.9 (102-204)	>12.0 (204)
Cardiovascular	MAP ≥70 mm Hg	MAP <70 mm Hg	Dopamine <5 or dobutamine (any dose)[b]	Dopamine 5.1-15 or epinephrine ≤0.1 or norepinephrine ≤0.1[b]	Dopamine >15 or epinephrine >0.1 or norepinephrine >0.1[b]
Central nervous system					
Glasgow Coma Scale score[c]	15	13-14	10-12	6-9	<6
Renal					
Creatinine, mg/dL (μmol/L)	<1.2 (110)	1.2-1.9 (110-170)	2.0-3.4 (171-299)	3.5-4.9 (300-440)	>5.0 (440)
Urine output, mL/d				<500	<200

Abbreviations: Fio_2, fraction of inspired oxygen; MAP, mean arterial pressure; Pao_2, partial pressure of oxygen.

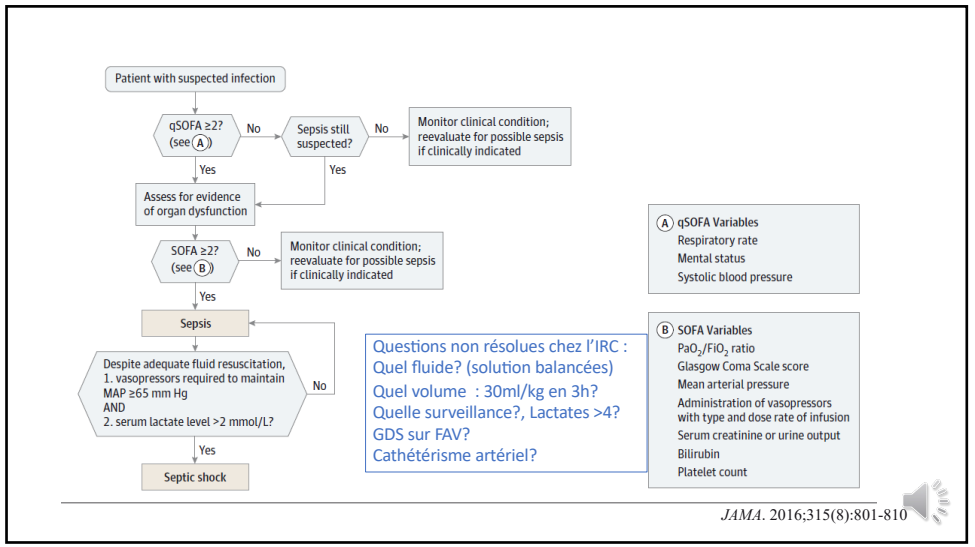
[b] Catecholamine doses are given as μg/kg/min for at least 1 hour.
[c] Glasgow Coma Scale scores range from 3-15; higher score indicates better neurological function.

Box 4. qSOFA (Quick SOFA) Criteria

Respiratory rate ≥22/min
Altered mentation
Systolic blood pressure ≤100 mm Hg

JAMA. 2016;315(8):801-810

6



JAMA. 2016;315(8):801-810

7

Antibiotic timing

	Shock is present	Shock is absent
Sepsis is definite or probable	✓ Administer antimicrobials **immediately**, ideally within 1 hour of recognition	
Sepsis is possible	✓ Administer antimicrobials **immediately**, ideally within 1 hour of recognition	✓ Rapid assessment* of infectious vs. noninfectious causes of acute illness
		✓ Administer antimicrobials **within 3 hours** if concern for infection persists

*Rapid assessment includes history and clinical examination, tests for both infectious and noninfectious causes of acute illness, and immediate treatment for acute conditions that can mimic sepsis. Whenever possible, this should be completed within 3 hours of presentation so that a decision can be made as to the likelihood of an infectious cause of the patient's presentation and timely antimicrobial therapy provided if the likelihood is thought to be high.

CJASN 17: 880–889, June, 2022

8

Procalcitonine et IRC

Table 2 Renal function, C-reactive protein (CRP), serum procalcitonin, and the prevalence of cardiovascular disease (CVD) in controls, in chronic kidney disease stages I–V (CKD I–V), haemodialysis (HD) and peritoneal dialysis (PD) from study 1. Serum PCT values are presented separately for patients with CVD+ and without CVD–

	GFR (ml/min/1.73 m^2)	Urine output (l/d)	CRP (mg/l)	CVD (%)	Procalcitonin (ng/ml)	
					CVD+	CVD–
Controls	112 ± 12	n.a.	0.7 ± 0.4	19	0.08 ± 0.01	0.10 ± 0.03
CKD						
I	106 ± 11	n.a.	0.9 ± 0.7	17	0.09 ± 0.04	0.10 ± 0.01
II	75 ± 10	n.a.	1.0 ± 0.8	15	0.10 ± 0.07	0.09 ± 0.02
III	44 ± 8	n.a.	1.3 ± 1.0	19	0.13 ± 0.09	0.14 ± 0.07
IV	22 ± 4	n.a.	1.5 ± 1.1	23	0.23 ± 0.14	0.14 ± 0.08
V	10 ± 5	n.a.	2.9 ± 1.7	34 *	0.51 ± 0.23†	0.29 ± 0.21
PD	3 ± 2	0.7 ± 0.5	4.1 ± 1.7‡	45§	0.56 ± 0.23†	0.38 ± 0.18
HD	0.7 ± 0.6	0.1 ± 0.1	5.3 ± 2.1‡	48¶	0.92 ± 0.42†	0.64 ± 0.34

GFR, glomerular filtration rate.
*$P < 0.05$ versus controls; †$P > 0.05$ versus CKD– patients of the respective group; ‡$P < 0.05$ versus control and CKD I–III; §$P < 0.01$ versus controls and CKD II; ¶$P < 0.01$ versus controls and $P < 0.05$ versus CKD I–III.

Scandinavian Journal of Immunology 61, 180–186

9

Table 5. Correlation between PCT and extent of infection.

Variables	Total N = 363	Bacteremia N = 73	Non-bacteremic infection N = 290
Median PCT	1.7 (0.1–252.5)	4.7 (0.1–173.1)	1.4 (0.1–252.5)
Mean PCT ± SD	13.9 ± 31.6	18.3 ± 33.7	12.8 ± 31.0

Table 6. Correlation between PCT and severity of sepsis.

Variables	Total N = 364	Shock N = 67	Sepsis N = 297
Median PCT	1.6 (0.1–252.5)	8.1 (0.1–252.5)	1.4 (0.1–200.0)
Mean PCT ± SD	13.9 ± 31.6	32.7 ± 52.2	9.6 ± 22.7

Table 7. Correlation between PCT value and infecting organism.

Variables	Total N = 192	Gram + N = 98	Gram - N = 90	Viral N = 4
Median PCT	2.5 (0.1–200.0)	1.7 (0.1–153.5)	3.8 (0.1–200.0)	3.5 (0.1–8.0)
Mean PCT ± SD	17.3 ± 34.1	13.7 ± 24.8	21.9 ± 42.2	3.7 ± 3.3

Table 9. Correlation between PCT and dialysis.

Variables	Total N = 364	CKD with dialysis N = 16
Median PCT	1.6 (0.1–252.5)	13.3 (0.1–200.0)
Mean PCT ± SD	13.9 ± 31.6	31.3 ± 51.5

PLOS ONE November 14, 2018 5 / 11

10

Evolution de la procalcitonine sur 72h dans un contexte d'IRA dialysée

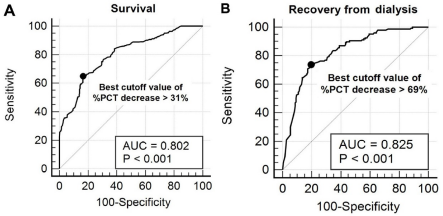


Fig 3. Receiver-operating characteristic curves of % PCT decrease for predicting survival (A) and recovery from dialysis (B) within 28 days after CRRT initiation in patients with SIAKI receiving CRRT. For all the participants (n = 649), the best cut-off value of % PCT decrease for predicting survival was > 31%, with an associated sensitivity of 64.8% and specificity of 83.6% (AUC: 0.802, 95% CI: 0.769–0.832, $P < 0.001$, Youden index: 0.48). In the survivors (n = 332), the best cut-off of % PCT decrease for predicting the recovery from dialysis was > 69%, with an associated sensitivity of 73.5% and specificity of 80.5% (AUC: 0.825, 95% CI: 0.780–0.864, $P < 0.001$, Youden index: 0.54). AKI, acute kidney injury; AUC, area under the curve; CI, confidence interval; CRRT, continuous renal replacement therapy; PCT, procalcitonin; SIAKI, sepsis-induced acute kidney injury.

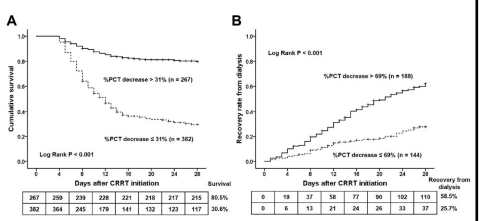


Fig 4. Probability of survival (A) and recovery from dialysis (B) according to the best cut-off value of % PCT decrease in patients with SIAKI receiving CRRT. In all the study subjects (n = 649), patients with a % PCT decrease > 31% showed a significant increase in the survival compared with those with % PCT decrease ≤ 31% (28-day survival: 80.5 vs. 30.6%, $P < 0.001$). In survivors (n = 332), patients with a % PCT decrease > 69% showed a significant higher rate of recovery from dialysis than those with a % PCT decrease ≤ 69% (28-day recovery rate from dialysis: 58.5% vs. 25.7%, $P < 0.001$). CRRT, continuous renal replacement therapy; PCT, procalcitonin; SIAKI, sepsis-induced acute kidney injury.

PLOS ONE December 27, 2022

11

Archives of Virology (2023) 168:87
https://doi.org/10.1007/s00705-023-05717-6

BRIEF REPORT

A multiplex-NGS approach to identifying respiratory RNA viruses during the COVID-19 pandemic

revealed the cocirculation of SARS-CoV-2 with human rhinovirus (hRV) A, B and C, human respiratory syncytial virus (hRSV) B, influenza A virus, and metapneumovirus B1. SARS-CoV-2 coinfections with hRV or hRSV B and influenza A virus coinfections with hRV C were identified in adults and/or children. This methodology combines the benefits of multiplex genomic amplification with the sensitivity and information provided by NGS. An advantage is that additional

> Proc Natl Acad Sci U S A. 2022 Oct 4;119(40):e2209607119. doi: 10.1073/pnas.2209607119.
Epub 2022 Sep 26.

A culture-free biphasic approach for sensitive and rapid detection of pathogens in dried whole-blood matrix

Anurup Ganguli [1 2], Jongwon Lim [1 2], Ariana Mostafa [1 2], Carlos Saavedra [2], Archith Rayabharam [3], Narayana R Aluru [3], Matthew Wester [1 2], Karen C White James Kumar [6 3], Reubin McGuffin [7], Ann Frederick [8], Enrique Valera [1 2], Rashid Bashir [1 2 3 9 10 11]

spectrum of pathogens, including gram-positive methicillin-resistant and methicillin-susceptible *Staphylococcus aureus* bacteria, gram-negative *Escherichia coli* bacteria, and *Candida albicans* (fungus) from whole blood with a limit of detection (LOD) of 1.2 colony-forming units (CFU)/mL from 0.8 to 1 mL of starting blood volume. We validated our assay using 63 clinical samples (100% sensitivity and specificity) and significantly reduced sample-to-result time from over 20 h to <2.5 h. The reduction in

Review > Clin Microbiol Infect. 2023 Mar;29(3):310-319. doi: 10.1016/j.cmi.2022.12.002.
Epub 2022 Dec 8.

Diagnostic accuracy of rapid antigen tests in cerebrospinal fluid for pneumococcal meningitis: systematic review and meta-analysis

Hidehiro Someko [1], Yuji Okazaki [2], Yasushi Tsujimoto [3], Masahiro Ishikane [4], Kenji Kubo [5], Tomoki Kakehashi [6]

Results: Forty-four studies involving 14 791 participants were included. Most studies had a moderate-to-low methodological quality. Summary sensitivity and specificity were 99.5% (95% confidence interval (CI), 92.4-100%) and 98.2% (95% CI, 96.9-98.9%), respectively. Positive predictive values and negative predictive values at the median prevalence (4.2%) in the included studies were 70.8% (95% CI, 56.6-79.9%) and 100% (95% CI, 99.7-100%), respectively. The diagnostic accuracy was consistent across the various subgroups, except for slightly reduced sensitivity in high-income countries.

12

Cohorte Choice

Table 4. Adjusted IRR for all infectious events by baseline phosphate level in hemodialysis patients only

Phosphate Level (mg/dl)	IRR (95% CI)			
	Adjusted[a] (n = 739)[b]	+Access Type (n = 504)	+Dialysis Dose (n = 578)	+Both (n = 393)
<3.5	0.87 (0.64 to 1.19)	0.83 (0.57 to 1.21)	1.21 (0.87 to 1.68)	1.13 (0.76 to 1.70)
3.5 to 5.5	1.00 (reference)	1.00 (reference)	1.00 (reference)	1.00 (reference)
>5.5	1.22 (1.07 to 1.39)[c]	1.27 (1.08 to 1.50)[c]	1.11 (0.95 to 1.29)	1.12 (0.93 to 1.35)
P for trend	0.005[c]	0.004[c]	0.180	0.224

[a]Adjusted for age, race, ICED, and albumin.
[b]Observations in groups with no variation in outcome dropped in conditional modeling.
[c]$P < 0.05$.

Catheter vs FAV ou prothèse

Clin J Am Soc Nephrol 3: 1398–1406, 2008

13

Pneumonie et IRC

	Patients with CKD death (n = 32)	Patients with CKD alive (n = 171)	P-value
Demographic data, n (%)			
Age, median (IQR), years	83 (73.5–86.5)	75 (65.5–82)	0.002
Male sex	24 (75)	117 (68.4)	0.45
Influenza vaccine (season)	14 (66.7)	111 (70.3)	0.73
Pneumococcal vaccine, 5 years	2/19 (10.5)	48/141 (34)	0.03
CKD Stage IV, n (%)	8 (25)	34 (19.9)	0.51
CKD Stage V, n (%)	8 (25)	48 (28.1)	0.72
Comorbid conditions, n (%)			
Chronic pulmonary disease	11 (34.4)	47 (27.5)	0.42
Chronic heart disease	19 (59.4)	76 (44.4)	0.12
Diabetes mellitus	11 (34.4)	56 (32.7)	0.85
Cognitive deficit	7 (21.9)	9 (5.3)	0.001
Clinical features at presentation, n (%)			
Fever (≥38.0°C)	4 (12.5)	76 (45)	0.001
Impaired consciousness	10 (31.3)	25 (14.7)	0.02
Septic shock	6 (18.8)	12 (7)	0.04
Laboratory and radiographic findings at presentation, n (%)			
Respiratory failure[a]	19 (76)	97 (63.8)	0.23
Leukocytosis (leukocytes ≥ 12 10^9/L)	15 (46.9)	113 (66.1)	0.03
Hypoalbuminaemia (albumin < 3.0 g/dL)	20 (76.9)	71 (47.7)	0.006
Multilobar pneumonia	13 (40.6)	40 (23.8)	0.04
High-risk PSI classes[b], n (%)	32 (100)	149 (87.6)	0.02
Outcomes, n (%)			
In-hospital complications			
Cardiac complications[c]	10 (35.7)	19 (11.1)	0.002
ICU admission	9 (28.9)	9 (5.3)	<0.001

[a]PaO2/FiO2 < 300 or PaO2 < 60 mmHg.
[b]Patients were stratified into the following risk classes according to the PSI score: low risk (≤90 points, Classes I, II and III) and high risk (>90 points, Classes IV and V).
[c]Acute coronary syndromes, arrhythmias and decompensated heart failure. IQR, interquartile range. PSI, pneumonia severity index.

Nephrol Dial Transplant (2011) 26: 2899–2906

14

Pneumonie et IRC

Table 2. Aetiology of pneumonia by study groups

	Patients with CKD ($n = 203$), n (%)	Patients without CKD ($n = 3597$), n (%)	P-value
Streptococcus pneumoniae	57 (28.1)	1248 (34.7)	0.05
Haemophilus influenzae	14 (6.9)	184 (5.1)	0.26
Aspiration pneumonia	13 (6.4)	291 (8.1)	0.38
Legionella pneumophila	9 (4.4)	204 (5.7)	0.45
Gram-negative bacilli	3 (1.5)	67 (1.9)	1
Pseudomonas aeruginosa	2 (1)	40 (1.1)	1
Atypical agents	7 (3.4)	225 (6.3)	0.10
Staphylococcus aureus	1 (0.5)	18 (0.5)	1
Others	3 (1.5)	32 (0.9)	0.43
No pathogen identified	100 (49.3)	1419 (39.4)	0.005

46 dialysés

Anurie chez certains, antigénurie impossible

Nephrol Dial Transplant (2011) 26: 2899–2906

15

Pneumonie et IRC

Table 5. Factors associated with mortality in patients with CKD and pneumonia: multivariate analysis

	OR (95% CI)	P-value
Age (+1 year increase)	1.25 (1.07–1.46)	0.004
Male sex	1.68 (0.30–9.42)	0.55
Pneumococcal vaccine	0.05 (0.005–0.69)	0.02
Comorbid conditions[a]	0.73 (0.10–5.12)	0.75
CKD Stage V	4.10 (0.38–43.8)	0.24
Impaired consciousness	1.44 (0.23–9.0)	0.69
Septic shock	6.02 (0.47–76.9)	0.16
Multilobar pneumonia	0.38 (0.04–3.05)	0.38
Hypoalbuminaemia (albumin < 3.0 g/dL)	1.10 (0.18–6.64)	0.91
Leukocytosis (leukocytes $\geq 12\ 10^9$/L)	0.10 (0.01–0.64)	0.01
Cardiac complications during hospitalization[b]	9.23 (1.39–61.1)	0.02

[a]Chronic pulmonary and heart disease, diabetes mellitus, chronic liver disease, cerebrovascular disease, cancer and cognitive deficit.
[b]Acute coronary syndromes, arrhythmias and decompensated heart failure.

Nephrol Dial Transplant (2011) 26: 2899–2906

16

Incidence des infections des sites d'accès

- **Taux d'incidence des IAV = 0,31 pour 100 mois de dialyse (vs 0,40 en 2016)**

→En diminution par rapport à 2016

- Fistules = **0,01 / 1 000 j d'utilisation (vs 0,03)**
- Prothèses = **0,00 / 1 000 j d'utilisation (vs 0,14)**
- Cathéters = **0,41/ 1 000 j d'utilisation (vs 0,53)**

Discussion

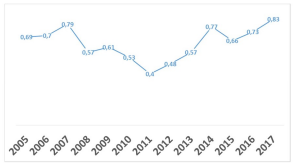
Les facteurs de risque d'infections d'accès vasculaire

- **Type d'accès vasculaire (cathéter > prothèse > fistule)**
- Existence d'un **Diabète**
- **Niveau d'hygiène** médiocre
- Antécédents de **SAMS/SAMR**

Incidence des bactériémies pour 100 mois de dialyse

- **Taux brut = 0,83 pour 100 mois de dialyse (vs 0,73)**

→ En augmentation par rapport à 2016



16

Bactériémies sur site d'accès

- Taux d'incidence = 0,06 / 1 000 j d'utilisation (vs 0,04)

→ **En augmentation par rapport à 2016**

- Fistules = 0,01 / 1 000 j d'utilisation (Vs 0,01)
- Prothèses = 0,00 / 1 000 j d'utilisation (Vs 0,00)
- Cathéters = 0,21 / 1 000 j d'utilisation (Vs 0,18)

Résultats dialin 2017

17

Table 3. Unadjusted and adjusted rates of catheter-related bloodstream infection

Variable Association with CRBSI	Hazard Ratio	95% Confidence Interval	*P* Value
Univariate analysis			
Age (≥75 versus 18–74 yr)	0.34	0.21 to 0.55	<0.001
Sex (women versus men)	1.17	0.89 to 1.54	0.26
Ancestry (African American versus European American/Hispanic)	1.25	0.95 to 1.65	0.12
Vintage (1-yr increments)	1.02	0.98 to 1.06	0.29
Diabetes mellitus (no versus yes)	0.89	0.68 to 1.18	0.42
Tunneled central venous catheter site (internal jugular/subclavian versus femoral)	0.51	0.36 to 0.73	<0.001
Catheter lock solution (gentamicin/citrate versus heparin/saline)	1.07	0.75 to 1.52	0.72
Immunosuppression (yes versus no)	1.61	0.95 to 2.72	0.09
Multivariate analysis			
Age (≥75 versus 18–74 yr)	0.33	0.20 to 0.55	<0.001
Sex (women versus men)	1.07	0.80 to 1.42	0.66
Ancestry (African American versus European American/Hispanic)	1.30	0.92 to 1.84	0.13
Vintage (1-yr increments)	1.01	0.97 to 1.05	0.66
Diabetes mellitus (no versus yes)	0.88	0.66 to 1.19	0.41
Tunneled central venous catheter site (internal jugular/subclavian versus femoral)	0.50	0.33 to 0.79	0.002
Catheter lock solution (gentamicin/citrate versus heparin/saline)	0.85	0.57 to 1.25	0.40
Immunosuppression (yes versus no)	1.40	0.81 to 2.43	0.25

Multivariate analysis adjusted for sex, ancestry, dialysis vintage, diabetes mellitus, coronary artery disease, congestive heart failure, dialysis unit, initial tunneled central venous catheter site, first catheter lock solution, and immunosuppression. CRBSI, catheter-related bloodstream infection.

Clin J Am Soc Nephrol 9: 764–770, 2014. doi

18

Table 5. Laboratory parameters and microorganisms recovered

Laboratory Parameters	All	Elderly (>75 yr)	Nonelderly (18–74 yr)	*P* Value
n	208	18	190	
spKt/V	1.49 (0.4)	1.52 (0.70)	1.50 (0.42)	0.57
URR (%)	71.0 (10.3)	69.2 (15.7)	71.2 (9.9)	0.47
Serum albumin (g/L)	3.7 (0.5)	3.6 (0.5)	3.7 (0.5)	0.56
Hemoglobin (g/dl)	11.2 (1.4)	11.7 (1.6)	11.2 (1.4)	0.37
Serum ferritin (ng/ml)	639.4 (505.1)	465 (379)	656 (516)	0.12
Microorganisms, *n* (%)	177 (85)	13 (72)	164 (86)	
Gram-positive cocci	131 (74)	9 (75)	122 (74)	
Staphylococcus aureus	46 (35)	4 (44)	42 (34)	
Gram-negative rods	38 (21)	3 (25)	35 (21)	
Fungal	2 (0.5)	0 (0)	2 (0.6)	

Laboratory parameters obtained within 30 days of the first catheter-related bloodstream infection event and microorganisms recovered throughout the entire study period. Data expressed in mean (SD). spKt/V, single pool Kt/V; URR, urea reduction ratio.

Clin J Am Soc Nephrol 9: 764–770, 2014. doi

19

Tunneled Catheter related Bacteremia in Hemodialysis

Design & Participants	Results	Outcomes
Retrospective cohort study 2005 - 2019	85 tunneled catheter related bacteremia	Incidence 0.40 per 1000 catheter day
325 patients 406 tunneled catheters Academic medical center	Protective factors ✓ Jugular vein HR 0.50 (0.28-0.90) ✓ Palindrome catheter HR 0.33 (0.19-0.58) ✓ First vascular access HR 0.40 (0.22-0.74)	*S. epidermidis (42.4%)* *S. aureus* (28%) Gram-negative organisms (15.4%) *Candida spp (1.2%)* 30-day mortality from the first bacteremia: 8.7%

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Journal of Nephrology (2023) 36:203–212

20

Bactériémie liées aux cathéters de dialyse (expérience bordelaise)

Tableau 2
Répartition des micro-organismes lors des 48 BLC d'HD au CHU de Bordeaux de 2018 à 2020 en fonction de l'espèce, du profil de résistance et du temps de pose du cathéter.

Micro-organismes	0–6 mois (dont nombre sur cathéter non tunnélisé : /X)	Supérieur à 6 mois	Date de pose du cathéter inconnue	Total
Staphylocoque Meti S	9/3	0	2	14
Staphylocoque Meti R CMI Vanco ≤ 1,5 mg/L	3/3	0	0	6
Staphylocoque Meti R CMI Vanco > 1,5 mg/L	2	0	0	2
Entérobactérie C3G S	12/2	3	0	17
Enterobactérie C3G R	0/1	0	0	1
Enterococcus faecalis	2	0	0	2
Pseudomonas aeruginosa	2	1	0	3
Stenotrophomonas maltophila	1	1	0	2
Acinetobacter sp.	1	0	0	1

BLC : bactériémie liée au cathéter ; HD : hémodialyse ; X/X : le premier chiffre intéresse les cathéters tunnelisés, le deuxième intéresse les cathéters transitoires.

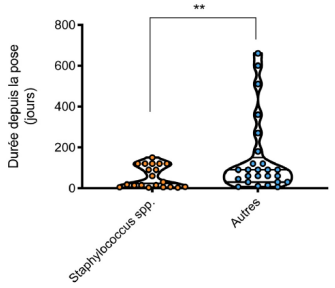


Fig. 2. Analyse des cathéters tunnélisés : comparaison du délai entre l'infection liée au cathéter tunnelisé et sa pose en fonction de l'implication ou non d'un genre bactérien type staphylocoque, au CHU de Bordeaux entre 2018 et 2020. Le délai entre l'infection liée au cathéter tunnelisé et sa pose a été comparé entre les infections liées à un staphylocoque et les infections liées à un autre germe, et ce délai était significativement plus court lorsqu'il s'agissait d'une infection liée à un staphylocoque (médiane ; interquartiles en jours : 18 ; 6,5–120 versus 90 ; 60–315 respectivement ; $p = 0{,}009$; test Mann–Withney), avec un délai n'excédant jamais 6 mois pour le staphylocoque.

Néphrologie & Thérapeutique 18 (2022) 80–88

21

Critères de l'IDSA

Les critères diagnostiques de l'*Infectious Diseases Society of America* (IDSA) et les défauts d'application à l'HD.

	Critères du diagnostic bactériologique de BLC	Difficultés rencontrées lors de l'application à l'HD
Avec retrait du cathéter en cause	Hémoculture positive et culture quantitative avec méthode de Brun Buisson positive > 1000 UFC/mL	Risque hémorragique au retrait Nécessité d'une nouvelle pose dans les 48 heures Hospitalisation systématique du patient Altération du capital veineux
Avec conservation du cathéter en cause	Hémocultures différentielles, sur le cathéter et en périphérie : rapport de compte bactérien > 3 ; ou différentiel de temps de pousse > 2 heures	Ponction périphérique non réalisable dans 60 % des cas Cathéter soumis à un débit sanguin de 300 mL/min

BLC : bactériémie liée au cathéter ; HD : hémodialyse ; UFC : unité formant colonie.

Diagnostic

Fièvre et frissons inconstants
Examen du tunnel pas toujours évocateur
Suspicion d'infection lié au KT si pas d'autre point d'appel évident et altération cognitive ou hypotension
Couverture conjointe des BG- et des Cocci+(notamment SAMR)
C3G, vancomycine ou daptomycine
Verrous ATB?
Sur dernière heure de dialyse
Béta lactamines, aminoglycosides et quinolones bien épurés
Dosage des concentrations sériques +- CMI

22

Recommandations pratiques

Antibiothérapie prolongé si phlébite, localisation secondaire ou endocardite
Hémocultures de contrôle
Recherche de thrombose
Échographie cardiaque systématique si *Staphylococcus aureus*

Ablation du KT formellement recommandée

- cathéter non tunnélisé ;
- état de choc ;
- infection de l'orifice du cathéter avec tunnelite ;
- fièvre persistante et hémocultures positives après 36 à 48 heures d'une antibiothérapie adaptée ;
- récidive malgré une antibiothérapie adaptée ;
- thrombose septique authentifiée par écho-Doppler ;
- endocardite infectieuse ou autres localisations secondaires ;
- après identification de certains germes.

Ablation du KT recommandée

S aureus
P aeruginosa
BMR
Candida spp

23

Preeminence of Staphylococcus aureus in Infective Endocarditis: A 1-Year Population-Based Survey

7 régions françaises
497 adultes
critères de Duke
année 2008
34/million d'habitants

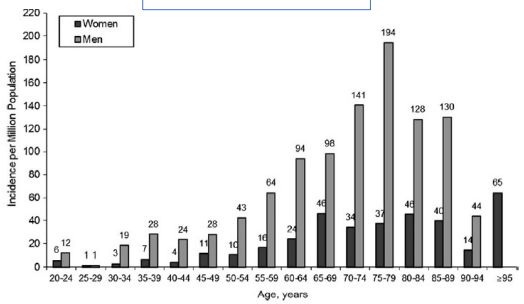


Figure 1. Incidence of infective endocarditis in the study population, by age and sex.

Table 3. Distribution of Causative Microorganisms in Patients With Infective Endocarditis

Microorganisms	No. (%) of Patients (n = 497)	
Streptococcaceae	240	(48.3)
Streptococci	180	(36.2)
Oral streptococci[a]	93	(18.7)
Group D streptococci[b]	62	(12.5)
Pyogenic streptococci	25	(5.0)
Enterococci	52	(10.5)
Other Streptococcaceae[c]	8	(1.6)
Staphylococcaceae	180	(36.2)
Staphylococcus aureus	132	(26.6)
Coagulase-negative staphylococci	48	(9.7)
Other microorganisms[d]	42	(8.5)
HACEK group	6	…
Enterobacteriaceae	4	…
Propionibacterium acnes	4	…
Pseudomonas aeruginosa	3	…
Lactobacillus species	2	…
Corynebacterium species	2	…
Coxiella burnetii	2	…
Bartonella quintana	1	…
Tropheryma whipplei	1	…
Candida species	6	…
Miscellaneous[e]	11	…
≥2 Microorganisms[f]	9	(1.8)
No microorganism identified	26	(5.2)

CID 2012:54 (1 May) ₀Selton-Suty et al

24

Preeminence of Staphylococcus aureus in Infective Endocarditis: A 1-Year Population-Based Survey

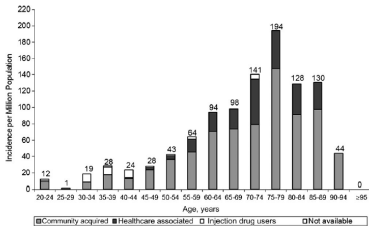


Figure 2. Incidence of infective endocarditis in the male population, by age and by mode of acquisition.

Variable	Whole Population	Community-Acquired Cases	Healthcare-Associated Cases	*P*	Prosthetic Valve	Previously Known HD	No Previously Known HD	*P*
Patient characteristics								
Total	497 (100)	335 (73.3)	122 (26.7)	…	104 (20.9)	131 (26.4)	262 (52.7)	…
Age, years, mean (SD)	62.3 (15.9)	62.9 (15.4)	67.4 (12.4)	.01	66.0 (14.7)	62.9 (16.1)	60.6 (16.1)	.01
Age ≥70 years	192 (38.6)	130 (38.8)	58 (47.5)	.09	52 (50.0)	56 (42.7)	84 (32.1)	.003
Male sex	369 (74.2)	260 (77.6)	78 (63.9)	.003	77 (74.0)	96 (73.3)	196 (74.8)	.95
Charlson comorbidity index, mean (SD)	1.9 (2.2)	1.7 (2.0)	2.9 (2.5)	<.0001	1.9 (2.0)	2.1 (2.2)	1.9 (2.3)	.52
≥1 Comorbidity	237 (47.7)	145 (43.3)	73 (59.8)	.002	48 (46.2)	58 (44.3)	131 (50.0)	.53
Diabetes mellitus	113 (22.7)	71 (21.2)	40 (32.8)	.01	25 (24.0)	28 (21.4)	60 (22.9)	.89
Cancer	89 (17.9)	55 (16.4)	32 (26.2)	.02	17 (16.3)	26 (19.8)	46 (17.6)	.77
Dialysis	11 (2.2)	0 (0)	10 (8.2)	<.0001	1 (1.0)	5 (3.8)	5 (1.9)	.33
IDU	29 (5.8)	0 (0)	0 (0)	…	3 (2.9)	2 (1.5)	24 (9.2)	.003
Cardiac history								

25

Caractéristiques liées à l'hôte

	EI 2008 N=497		EuroEndo N=3116	
Age (moy, écart-type)	62.3	15.9	59.2	18.0
Sexe (hommes)	369	74.2%	2147	68.9%
Au moins une comorbidité	237	47.7%		
Diabète	113	22.7%	706	22.7%
Dialyse	11	2.2%	163	5.2%
Cardiopathie sous-jacente				
Prothèse valvulaire	104	20.9%	939	30.1%
Cardiopathie connue non proth	131	26.4%	1764*	56.6%
Absence de cardiopathie connue	262	52.7%		
Stimulateurs (PM/DAI)	66 (58/8)	13.3%	308	9.9%

C SELTON-SUTY

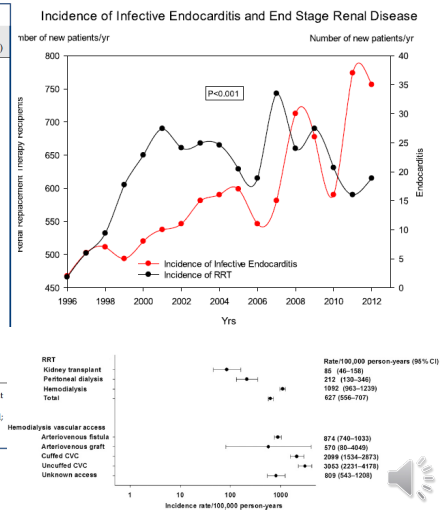
**valve native, connue ou non*

26

Table 2. Risk factors for infective endocarditis in patients with incident ESRD receiving RRT in Denmark

Parameter	Number of Events	Unadjusted Incidence Rate/100,000 person-years	Hazard Ratio (95% Confidence Interval)
Renal replacement modality			
Uncuffed CVC	39	3053	14.10 (7.76 to 25.50)
Cuffed CVC	39	2099	10.03 (5.52 to 18.24)
Arteriovenous fistula	138	874	4.59 (2.73 to 7.73)
Arteriovenous graft	1	570	3.19 (0.42 to 24.26)
Unknown hemodialysis access	24	809	3.67 (1.94 to 6.94)
Hemodialysis	241	1092	5.46 (3.28 to 9.10)
Kidney transplant	10	85	0.41 (0.18 to 0.91)
Peritoneal dialysis	16	212	1.00 (reference)
RRT periods			
RRT period 1[a]	67	1353	1.89 (1.37 to 2.60)
RRT period 2[a]	67	501	0.80 (0.59 to 1.10)
RRT period 3[a]	133	549	1.00 (reference)
Sex			
Male	163	607	0.91 (0.71 to 1.18)
Female	104	663	1.00 (reference)
Comorbidity			
Diabetes mellitus			
1	102	817	1.12 (0.87 to 1.45)
0	165	549	1.00 (reference)
Endocarditis[b]			
1	20	17321	22.24 (13.50 to 36.62)
0	247	581	1.00 (reference)
Aortic valve disease			
1	41	2139	2.65 (1.68 to 4.18)
0	226	556	1.00 (reference)
Mitral valve disease			
1	20	1757	1.38 (0.71 to 2.70)
0	247	596	1.00 (reference)

Model adjusted for sex, age, diabetes, aortic valve disease, mitral valve disease, previous endocarditis, calendar year, renal replacement periods (<183, 184–845, and >845 d in RRT). CVC, central venous catheter.
[a]Renal replacement period 1: first 183 d in renal replacement period; renal replacement period 2: 184–845 d in renal replacement period; renal replacement period 3: >845 d.
[b]Before initiation of RRT.



Clin J Am Soc Nephrol 12: 1814–1822, 2017

27

Prevalence and risk factors related to infections of cardiac resynchronization therapy devices

De Janvier2001 à mai 2007,
Étude Stéphanoise
303 resynchronisateurs suivi moyen 31 +-19 mois

4,3% infections et 1,3% EI

Facteurs prédictifs indépendants

Temps de procedure 85 vs. 57.5 min; P = 0.002
Réintervention (54 vs. 6.5%; P = 0,0006
CRT- ICD vs autres procedures p= 0,01

Dialyse 23,1 vs 1,72%, HR 13,39 [2,73- 65,62]

Romeyer –Bouchard C et al , Eur Heart J 2010 31 , 203-210

28

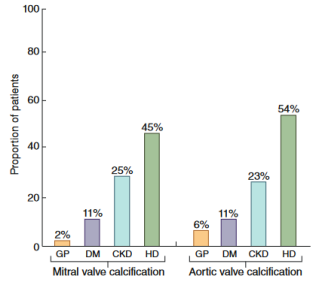


Figure 3 | Prevalence of valvular calcification in the general population and in patients with kidney disease.[8,9] CKD, chronic kidney disease; DM, diabetes mellitus; GP, general population; HD, hemodialysis.

Marwick kidney int 2019

L'Insuffisant Rénal
- Age
- Malnutrition
- Anémie
- Comorbidités (diabète, ImmunoSuppression)
- Calcifications valvulaires Valvulopathies dégénératives

La Dialyse
- Accès vasculaires répétés
- Différentes voies d'abord vasculaires

Les Pathogènes
- Infections fréquentes des sites d'accès
- Bactériémies fréquentes
- Staphylocoques++

29

- L'antibioprophylaxie* n'est plus recommandée que pour les gestes dentaires et uniquement pour les patients à haut risque
  - Porteur de prothèse valvulaire ou matériel de réparation valvulaire
  - Patient ayant déjà fait une endocardite
  - Patient avec cardiopathie congénitale cyanogène non opérée
  - Patient avec cardiopathie congénitale opérée avec mise en place de matériel prothétique (pendant les 6 mois suivant la réparation ou à vie si il persiste une fuite ou un shunt)

*2g amoxicilline 1h avant le geste

Recommendations	Class[a]	Level[b]
1. Prophylaxis/prevention		
Antibiotic prophylaxis should be considered for patients at highest risk for IE: a. Patients with any prosthetic valve, including transcatheter valve, or those in whom any prosthetic material was used for cardiac valve repair b. Patients with a previous episode of IE c. Patients with congenital heart disease (i.e. any type of cyanotic congenital heart disease or any type of congenital heart disease repaired with a prosthetic material)	IIa	C
Antibiotic prophylaxis is not recommended in other forms of valvular or congenital heart disease	III	C
Dental procedures		
Antibiotic prophylaxis should only be considered for dental procedures requiring manipulation of the gingival or periapical region of the teeth or perforation of the oral mucosa	IIa	C
Other procedures		
Antibiotic prophylaxis is not recommended for respiratory tract procedures, including bronchoscopy or laryngoscopy, transnasal or endotracheal intubation, gastroscopy, colonoscopy, cystoscopy, vaginal or caesarean delivery, TOE or skin and soft tissue procedures	III	C

30

2. Recommendations for referring patients to the Reference Centre		
Patients with complicated IE should be evaluated and managed at an early stage in a reference centre with immediate surgical facilities and the presence of a multidisciplinary Endocarditis Team, including an ID specialist, a microbiologist, a cardiologist, imaging specialists, a cardiac surgeon and, if needed, a specialist in CHD	IIa	B
For patients with non-complicated IE managed in a non-reference centre, there should be early and regular communication with the reference centre and, when needed, visits to the reference centre, should be made	IIa	B

Répéter les échocardiographies
Répéter les échocardiographies
Répéter les échocardiographies

3. Diagnosis		
TTE is recommended as the first-line imaging modality in suspected IE	I	B
TOE is recommended in all patients with clinical suspicion of IE and a negative or non-diagnostic TTE	I	B

Recommendations	Class[a]	Level[b]
TOE is recommended in patients with clinical suspicion of IE when a prosthetic heart valve or an intracardiac device is present	I	B
Repeat TTE and/or TOE within 5–7 days is recommended in case of initially negative examination when clinical suspicion of IE remains high	I	C
Repeat TTE and/or TOE are recommended as soon as a new complication of IE is suspected (new murmur, embolism, persisting fever, HF, abscess, atrioventricular block)	I	B

4. Treatment		
Aortic or mitral NVE or PVE with severe regurgitation or obstruction causing symptoms of HF or echocardiographic signs of poor haemodynamic tolerance must by treated by urgent surgery	I	B
Locally uncontrolled infection (abscess, false aneurysm, fistula, enlarging vegetation) must by treated by urgent surgery	I	B
Infection caused by fungi or multiresistant organisms must by treated by urgent surgery	I	C
Aortic or mitral NVE or PVE with persistent vegetations >10 mm after ≥1 embolic episodes despite appropriate antibiotic therapy must by treated by urgent surgery	I	B

31

Table 15 Predictors of poor outcome in patients with infective endocarditis

Patient characteristics
- Older age
- Prosthetic valve IE
- Diabetes mellitus
- Comorbidity (e.g., frailty, immunosuppression, renal or pulmonary disease)

Clinical complications of IE
- Heart failure
- Renal failure
- >Moderate area of ischaemic stroke
- Brain haemorrhage
- Septic shock

Microorganism
- *Staphylococcus aureus*
- Fungi
- Non-HACEK Gram-negative bacilli

Echocardiographic findings
- Periannular complications
- Severe left-sided valve regurgitation
- Low left ventricular ejection fraction
- Pulmonary hypertension
- Large vegetations
- Severe prosthetic valve dysfunction
- Premature mitral valve closure and other signs of elevated diastolic pressures

HACEK = Haemophilus parainfluenzae, H. aphrophilus, H. paraphrophilus, H. influenzae, Actinobacillus actinomycetemcomitans, Cardiobacterium hominis, Eikenella corrodens, Kingella kingae, and K. denitrificans; IE = infective endocarditis.

Table 24 Factors associated with an increased rate of relapse

- Inadequate antibiotic treatment (agent, dose, duration)
- Resistant microorganisms, i.e. *Brucella spp., Legionella spp., Chlamydia spp., Mycoplasma spp., Mycobacterium spp., Bartonella spp., Coxiella Burnetii, fungi*
- Polymicrobial infection in an IVDA
- Empirical antimicrobial therapy for BCNIE
- Periannular extension
- Prosthetic valve IE
- Persistent metastatic foci of infection (abscesses)
- Resistance to conventional antibiotic regimens
- Positive valve culture
- Persistence of fever at the seventh postoperative day
- Chronic dialysis

BCNIE = blood culture-negative infective endocarditis; IE = infective endocarditis; IVDA = intravenous drug abuser.

CMI des germes
CMI des germes
CMI des germes

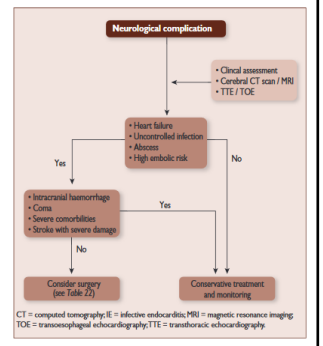
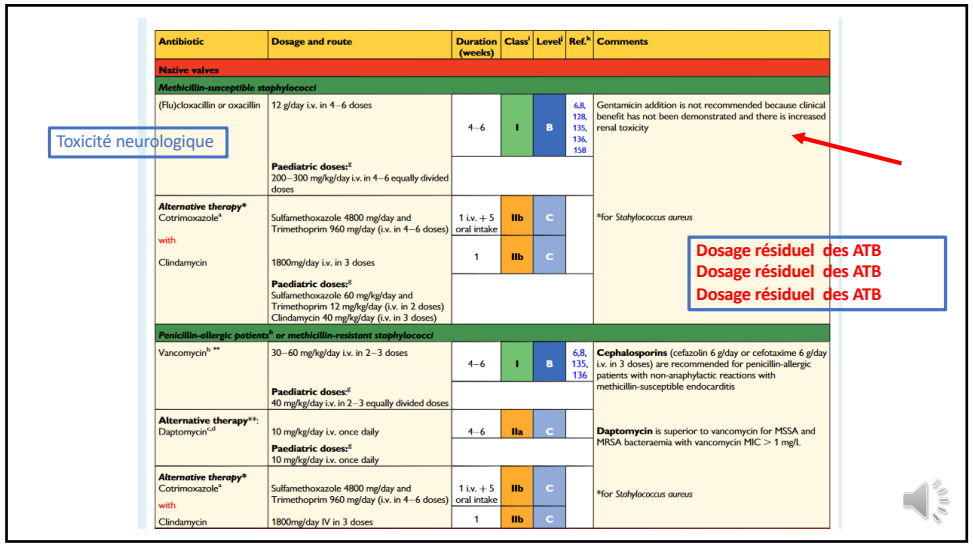


Figure 4 Therapeutic strategies for patients with infective endocarditis and neurological complications.

32

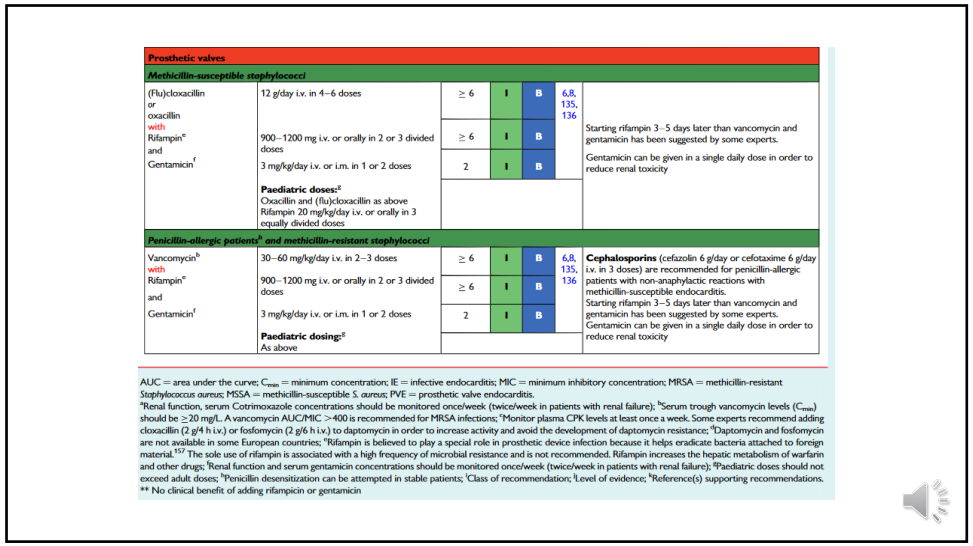


Antibiotic	Dosage and route	Duration (weeks)	Class[j]	Level[j]	Ref.[k]	Comments
Native valves						
Methicillin-susceptible staphylococci						
(Flu)cloxacillin or oxacillin	12 g/day i.v. in 4–6 doses	4–6	I	B	6,8, 128, 135, 136, 158	Gentamicin addition is not recommended because clinical benefit has not been demonstrated and there is increased renal toxicity
	Paediatric doses:[g] 200–300 mg/kg/day i.v. in 4–6 equally divided doses					
Alternative therapy* Cotrimoxazole[a]	Sulfamethoxazole 4800 mg/day and Trimethoprim 960 mg/day (i.v. in 4–6 doses)	1 i.v. + 5 oral intake	IIb	C		*for *Stahylococcus aureus*
with						
Clindamycin	1800mg/day i.v. in 3 doses	1	IIb	C		
	Paediatric doses:[g] Sulfamethoxazole 60 mg/kg/day and Trimethoprim 12 mg/kg/day (i.v. in 2 doses) Clindamycin 40 mg/kg/day (i.v. in 3 doses)					
Penicillin-allergic patients[h] or methicillin-resistant staphylococci						
Vancomycin[b] **	30–60 mg/kg/day i.v. in 2–3 doses	4–6	I	B	6,8, 135, 136	**Cephalosporins** (cefazolin 6 g/day or cefotaxime 6 g/day i.v. in 3 doses) are recommended for penicillin-allergic patients with non-anaphylactic reactions with methicillin-susceptible endocarditis
	Paediatric doses:[g] 40 mg/kg/day i.v. in 2–3 equally divided doses					
Alternative therapy**: Daptomycin[c,d]	10 mg/kg/day i.v. once daily	4–6	IIa	C		**Daptomycin** is superior to vancomycin for MSSA and MRSA bacteraemia with vancomycin MIC > 1 mg/L
	Paediatric doses:[g] 10 mg/kg/day i.v. once daily					
Alternative therapy* Cotrimoxazole[a]	Sulfamethoxazole 4800 mg/day and Trimethoprim 960 mg/day (i.v. in 4–6 doses)	1 i.v. + 5 oral intake	IIb	C		*for *Stahylococcus aureus*
with						
Clindamycin	1800mg/day IV in 3 doses	1	IIb	C		

Toxicité neurologique

Dosage résiduel des ATB
Dosage résiduel des ATB
Dosage résiduel des ATB

33



Prosthetic valves						
Methicillin-susceptible staphylococci						
(Flu)cloxacillin or oxacillin	12 g/day i.v. in 4–6 doses	≥ 6	I	B	6,8, 135, 136	
with						
Rifampin[e]	900–1200 mg i.v. or orally in 2 or 3 divided doses	≥ 6	I	B		Starting rifampin 3–5 days later than vancomycin and gentamicin has been suggested by some experts.
and						
Gentamicin[f]	3 mg/kg/day i.v. or i.m. in 1 or 2 doses	2	I	B		Gentamicin can be given in a single daily dose in order to reduce renal toxicity
	Paediatric doses:[g] Oxacillin and (flu)cloxacillin as above Rifampin 20 mg/kg/day i.v. or orally in 3 equally divided doses					
Penicillin-allergic patients[h] and methicillin-resistant staphylococci						
Vancomycin[b]	30–60 mg/kg/day i.v. in 2–3 doses	≥ 6	I	B	6,8, 135, 136	**Cephalosporins** (cefazolin 6 g/day or cefotaxime 6 g/day i.v. in 3 doses) are recommended for penicillin-allergic patients with non-anaphylactic reactions with methicillin-susceptible endocarditis. Starting rifampin 3–5 days later than vancomycin and gentamicin has been suggested by some experts. Gentamicin can be given in a single daily dose in order to reduce renal toxicity
with						
Rifampin[e]	900–1200 mg i.v. or orally in 2 or 3 divided doses	≥ 6	I	B		
and						
Gentamicin[f]	3 mg/kg/day i.v. or i.m. in 1 or 2 doses	2	I	B		
	Paediatric dosing:[g] As above					

AUC = area under the curve; C_{min} = minimum concentration; IE = infective endocarditis; MIC = minimum inhibitory concentration; MRSA = methicillin-resistant *Staphylococcus aureus*; MSSA = methicillin-susceptible *S. aureus*; PVE = prosthetic valve endocarditis.
[a]Renal function, serum Cotrimoxazole concentrations should be monitored once/week (twice/week in patients with renal failure); [b]Serum trough vancomycin levels (C_{min}) should be ≥20 mg/L. A vancomycin AUC/MIC >400 is recommended for MRSA infections; [c]Monitor plasma CPK levels at least once a week. Some experts recommend adding cloxacillin (2 g/4 h i.v.) or fosfomycin (2 g/6 h i.v.) to daptomycin in order to increase activity and avoid the development of daptomycin resistance; [d]Daptomycin and fosfomycin are not available in some European countries; [e]Rifampin is believed to play a special role in prosthetic device infection because it helps eradicate bacteria attached to foreign material.[157] The sole use of rifampin is associated with a high frequency of microbial resistance and is not recommended. Rifampin increases the hepatic metabolism of warfarin and other drugs; [f]Renal function and serum gentamicin concentrations should be monitored once/week (twice/week in patients with renal failure); [g]Paediatric doses should not exceed adult doses; [h]Penicillin desensitization can be attempted in stable patients; [i]Class of recommendation; [j]Level of evidence; [k]Reference(s) supporting recommendations.
** No clinical benefit of adding rifampicin or gentamicin

34

Pet scan et polykystose (dialysés, non dialysés, TR)

TABLE 2. Diagnostic performance of [^{18}F]fluorodeoxyglucose (18-FDG) positron emission tomography–computed tomography (PET–CT) and computed tomography (CT)

	18-FDG PET–CT	CT
True positives (*n*)	14/32	1/21
False positives (*n*)	0/32	0/21
True negatives (*n*)	14/32	7/21
False negatives (*n*)	4/32	13/21
PPV (%)	100	100
NPV (%)	77	35
Sensitivity (%)	77	7
Specificity (%)	100	100
p	—	<0.001

NPV, negative predictive value; PPV, positive predictive value.

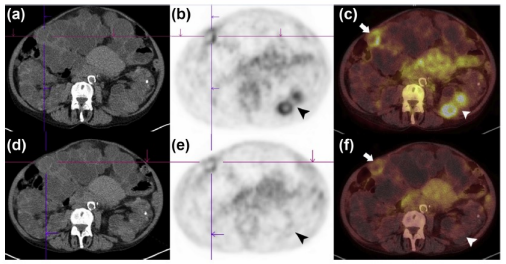
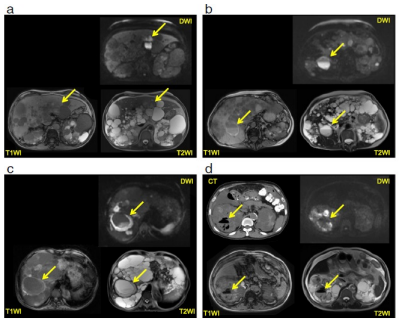


FIG. 3. [^{18}F]Fluorodeoxyglucose (18-FDG) positron emission tomography–computed tomography (PET–CT) sequence in a patient with hepatic and renal cysts. (a–c) 18-FDG PET–CT image showing pathological hypermetabolism of the left renal cysts (arrowhead) and a hepatic cyst (arrow). (d–f) 18-FDG PET–CT scan performed after 8 weeks of antibiotic treatment (persistence of elevated C-reactive protein level), showing the disappearance of kidney hypermetabolic foci (arrowhead), but the persistence of a hypermetabolic hepatic cyst, which led to the continuation of antibiotics for an additional 2 weeks with complete resolution of blood inflammation.

Pet scan 5,5j après le début des ATB chez les 14 vrais positifs
et 17j après le début des ATB chez les 4 faux négatifs

M Bobot,… , N Jourde Chiche Clin Microbiol Infect 2016; 22: 71–77

35



a) MRI findings (T1WI, T2WI, and DWI) The infected renal cyst shows a higher intensity on DWI compared with normal cysts, but it is difficult to identify on T1WI and T2WI.
b) b MRI findings (T1WI, T2WI, and DWI) A fluid-fluid level and cyst wall thickening can be seen. The infected renal cyst shows a higher intensity on DWI and T1WI than normal cysts, while it has a lower intensity on T2WI.
c) MRI findings (T1WI, T2WI, and DWI) Obvious cyst wall thickening can be seen. The infected cyst is iso-intense on T1WI, T2WI, and DWI.
d) MRI findings (T1WI, T2WI, and DWI)ction. Gas is seen on T1WI, T2WI, and CT. The infected renal cyst shows a higher intensity on DWI compared with normal cysts, while it has a lower intensity on T2WI and T1WI

IRM et polykystose

Table 2 Number of episodes with each MRI feature of cyst infection, and the sensitivity and specificity of each MRI feature

	Cases (*n*=88)	Controls (*n*=147)	Sensitivity	Specificity
High SI on DWI (%)	86.4	66.7	86.4	33.3
Fluid-fluid level (%)	50.0	12.9	50.0	87.1
Wall thickening (%)	48.3	10.9	48.3	89.1
Fluid-fluid level or wall thickening (%)	84.1	19.7	84.1	80.3
Gas (%)	1.1	0	1.1	100
At least one of these four features (%)	100	68.0	100	32.0
High SI on DWI with diameter > 5cm (%)	69.3	15.6	69.3	84.4
Fluid-fluid level or wall thickening with diameter > 5cm (%)	72.7	8.8	72.7	91.2
At least one of these four features with diameter > 5cm (%)	83.0	18.4	83.0	81.6

Suwabe et al. BMC Nephrology (2016) 17:170

36

Diffusion antibiothérapie mal connue

Diffusion méropenem mauvaise

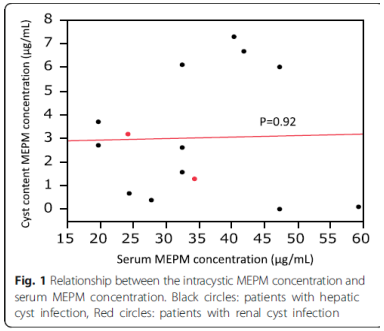


Fig. 1 Relationship between the intracystic MEPM concentration and serum MEPM concentration. Black circles: patients with hepatic cyst infection, Red circles: patients with renal cyst infection

Hamanoue et al. BMC Nephrology (2018) 19:272

37

Péritonite en dialyse péritonéale

1) clinical features consistent with peritonitis : abdominal pain and/or cloudy dialysis effluent;
2) dialysis effluent white cell count > 100/mL or > 0.1 10_9/L (after a dwell time of at least 2 h), with > 50% polymorphonuclear leukocytes (PMN);
3) positive dialysis effluent culture (1C).

We recommend that the **blood culture bottle(s) be the preferred technique for bacterial culture of PD** effluent (1C).
We suggest that **icodextrin be considered for volume overload** which occurs during acute peritonitis (2C).

Patients with cloudy effluent may benefit from the **addition of heparin 500 units/L** IP to prevent occlusion of the catheter by fibrin.

Peritoneal Dialysis International 2022, Vol. 42(2) 110–153

Table 4. Differential diagnosis of cloudy effluent.

Cellular causes
PMN leucocytes
Culture-positive infectious peritonitis
Infectious peritonitis with sterile cultures
Chemical peritonitis
Eosinophils
Dialysate eosinophilia
Chemical peritonitis
Monocyte/macrophages
Specimen taken from 'dry' abdomen (after prolonged peritoneal rest)
Red blood cells
Hemoperitoneum
Malignant cells
Lymphoma
Peritoneal metastasis
Non-cellular causes
Fibrin
Triglycerides (milky white appearance of effluent)
Calcium channel blockers
Lymphatic obstruction
Acute pancreatitis

PMN: polymorphonuclear.

38

Péritonite en dialyse péritonéale

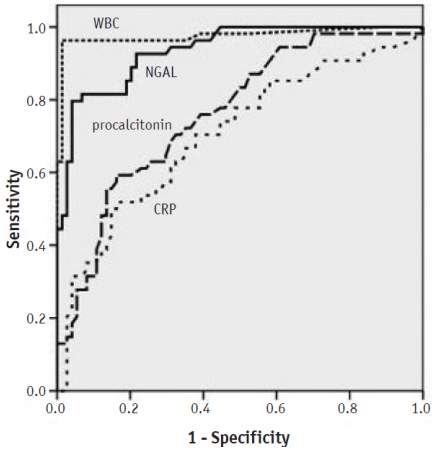


TABLE 3
Measure of Performance Test with Binary Classification of Peritonitis Biomarkers

	CRP	PCT	WBC in PDE	Peritoneal NGAL
Sensitivity (%)	51	61	91	90
Specificity (%)	65	75.6	93.2	82
False positive (%)	48	24.3	8.6	10
False negative (%)	34	38.3	7	17.6

CRP = C-reactive protein; PCT = procalcitonin; WBC = white blood cell; PDE = peritoneal dialysis effluent; NGAL = neutrophil gelatinase-associated lipocalin.
The test was considered positive if >0.5 mg/dL for CRP, 0.5 ng/mL for Procalcitonin, $>0.1 \times 10^9$/L for WBC count in peritoneal dialysis effluent, and >85 ng/mL for peritoneal NGAL.

***Perit Dial Int* 2015; 35(5):559–565**

39

Péritonite en dialyse péritonéale

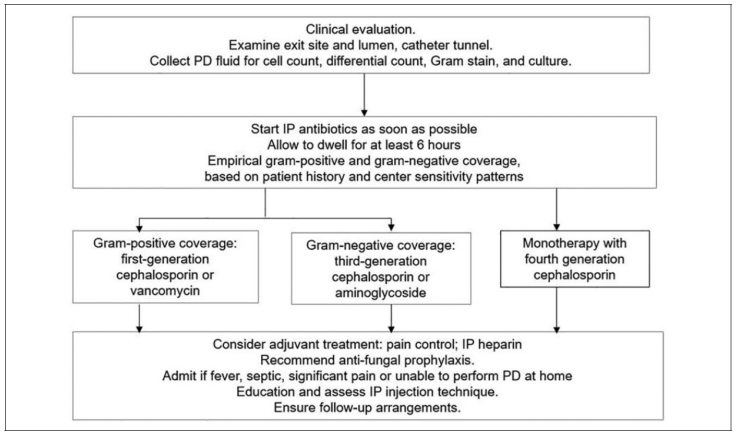


Figure 1. The algorithm of initial management for PD patients presenting with a clinical diagnosis of peritonitis. PD: peritoneal dialysis.

Peritoneal Dialysis International 2022, Vol. 42(2) 110–153

40

Vancomycine intrapéritonéale

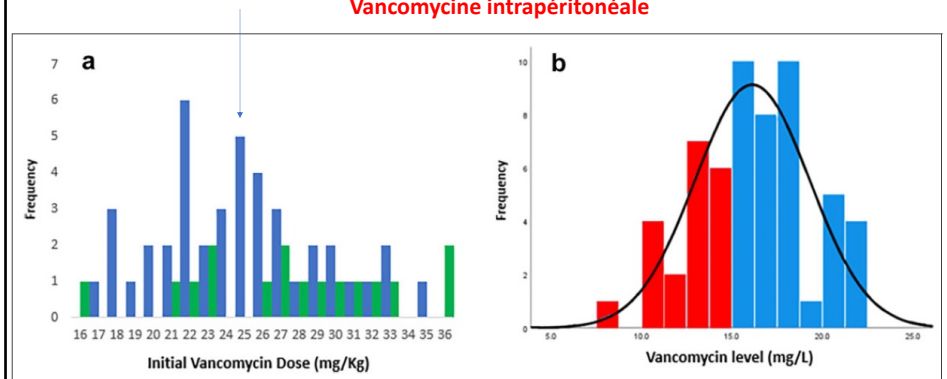


Figure 2. Distribution of vancomycin loading doses and day 3 levels. (a) Initial vancomycin dose (mg/kg) in men (blue) versus women (green). Dose rounded to nearest whole number. (b) Day 3 vancomycin level (mg/L); red < therapeutic level, blue = therapeutic level.

Deacon, Peritoneal Dialysis International2023, Vol. 43(1) 45–52

41

Péritonite en dialyse péritonéale

Table 5. IP antibiotic dosing recommendations for treatment of peritonitis.

Antibiotic	Intermittent (1 exchange daily for at least 6 h)	Continuous (all exchanges)
Aminoglycosides		
Amikacin	2 mg/kg daily[173]	Not advised
Gentamicin	0.6 mg/kg daily[174,175]	Not advised
Netilmicin	0.6 mg/kg daily[165]	Not advised
Tobramycin	0.6 mg/kg daily	Not advised
Cephalosporins		
Cefazolin	15 mg/kg daily (for long dwell)[176,177] 20 mg/kg daily (for short dwell)[178,176]	LD 500 mg/L, MD 125 mg/L[d 168,179]
Cefepime	1000 mg daily	LD 500 mg/L, MD 125 mg/L[d 168]
Cefoperazone	No data	LD 500 mg/L, MD 62.5–125 mg/L[180]
Cefotaxime	500–1000 mg daily[181]	no data
Ceftazidime	1000–1500 mg daily (for long dwell) 20 mg/kg daily (for short dwell)[178]	LD 500 mg/L, MD 125 mg/L[d 168,182]
Ceftriaxone	1000 mg daily[183]	No data
Penicillins		
Penicillin G	No data	LD 50,000 unit/L, MD 25,000 unit/L[13]
Amoxicillin	No data	MD 150 mg/L[184]
Ampicillin[a]	4 gm daily[185]	MD 125 mg/L[186]
Ampicillin/sulbactam		LD 1000 mg/500 mg, MD 133.3 mg/66.7 mg[187,188]
Piperacillin/tazobactam	No data	LD 4 gm/0.5 gm, MD 1 gm/0.125 gm[189]
Ticarcillin/clavulanic acid	No data	LD 3 gm/0.2 gm, MD 300 mg/20 mg/L[190]
Others		
Aztreonam	2 gm daily[191]	LD 500 mg/L[192], MD 250 mg/L[192,193]
Ciprofloxacin	No data	MD 50 mg/L[194]
Clindamycin	No data	MD 600 mg/bag[195]
Daptomycin	300 mg daily[196]	LD 100 mg/L[197,198,199], MD 20 mg/L[197,200]
Fosfomycin	4 g daily[201,202]	No data
Imipenem/cilastatin	500 mg in alternate exchange[203]	LD 250 mg/L, MD 50 mg/L[182]
Ofloxacin	No data	LD 200 mg, MD 25 mg/L[204]
Polymyxin B	No data	MD 300,000 unit (30 mg)/bag[188]
Quinupristin/dalfopristin	25 mg/L in alternate exchanges[b205]	No data
Meropenem	500 mg daily (for long dwell in APD)[207] 1000 mg daily (for short dwell in CAPD)[b208,209]	MD 125 mg/L[206]
Teicoplanin	15 mg/kg every 5 days[210]	LD 400 mg/bag, MD 20 mg/L[211,140]
Vancomycin	15–30 mg/kg every 5–7 days[c141,212] for CAPD 15 mg/kg every 4 days[213] for APD	LD 20–25 mg/kg, MD 25 mg/L[214]
Antifungal		
Fluconazole	IP 150–200 mg every 24 to 48 h[215,216] (oral route is preferred: see Table 6)	No data
Voriconazole	IP 2.5 mg/kg daily[217] (oral route is preferred: see Table 6)	No data

LD: loading dose in mg; MD: maintenance dose in mg; IP: intraperitoneal; APD: automated peritoneal dialysis.
A IP ampicillin is not recommended for treatment of enterococcal peritonitis.
B Given in conjunction with 500 mg intravenous twice daily.
C Supplemental doses may be needed for APD patients and dwell time of at least 6 h is preferred.
D Increase in doses by 25% may be needed for patients with significant residual kidney function.

Peritoneal Dialysis International 2022, Vol. 42(2) 110–153

42

Péritonite en dialyse péritonéale

Table 6. Systemic antibiotic dosing recommendations for treatment of peritonitis.

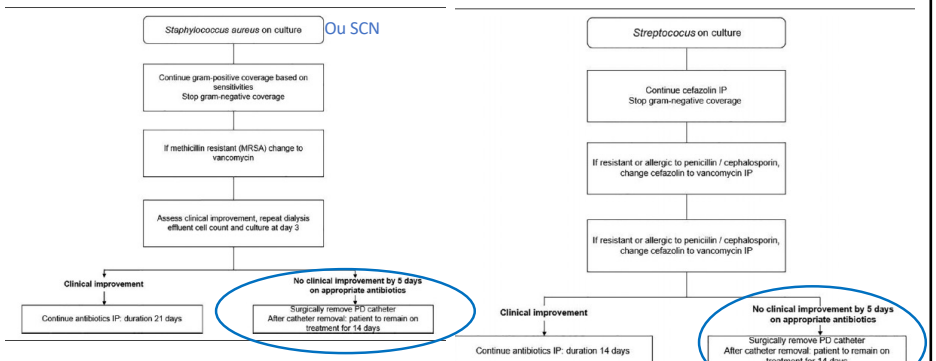
Drug	Dosing
Antibacterial	
Amoxicillin	Oral 500 mg thrice daily[219]
Ciprofloxacin	Oral 500–750 mg daily[220] Oral 750 mg BD for CCPD[221]
Clarithromycin	Oral 250 mg BD[222,223]
Colistin	IV 300 mg loading (for critically ill patients), then 60–200 mg daily[b,224-226]
Dalbavancin	IV 1500 mg over 30 min single dose[227]
Daptomycin	IV 4–6 mg/kg every 48 h[228]
Ertapenem[a]	IV 500 mg daily[229]
Levofloxacin	Oral 250 mg daily[230] or 500 mg every 48 h
Linezolid	IV or oral 600 mg BD[231,232] for 48 h, then 300 mg BD[233]
Moxifloxacin	Oral 400 mg daily[234,235]
Rifampicin	Oral or IV 450 mg daily for BW <50 kg; 600 mg daily for BW ≥50 kg
Ticarcillin/clavulanic acid	IV 3 gm/0.2 gm every 12 h
Tigecycline	IV 100 mg loading, then 50 mg every 12 h[236,237]
Trimethoprim/sulfamethoxazole	Oral 160 mg/800 mg BD[238,239]
Anti-fungal	
Amphotericin B desoxycholate	IV 0.75–1.0 mg/kg/day over 4–6 h[240]
Amphotericin B (liposomal)	IV 3–5 mg/kg/day[241,242]
Anidulafungin	IV 200 mg loading, then 100 mg daily[243,244]
Caspofungin	IV 70 mg loading, then 50 mg daily[243]
Fluconazole	Oral 200 mg loading, then 100 mg daily[240]
Flucytosine	Oral 1 gm daily[240]
Isavuconazole	Oral or IV 200 mg every 8 h for 6 doses (48 h) loading, then 200 mg daily
Micafungin	IV 100 mg daily[243,245]
Posaconazole	Oral tablet 300 mg every 12 h loading for two doses, then 300 mg daily[246]
Voriconazole	Oral 200 mg every 12 h

BD: twice a day; IV: intravenous; BW: body weight.
[a]Ertapenem is not active against *Pseudomonas* or *Acinetobacter* species.
[b]Expressed as colistin base activity in mg.

Peritoneal Dialysis International 2022, Vol. 42(2) 110–153

43

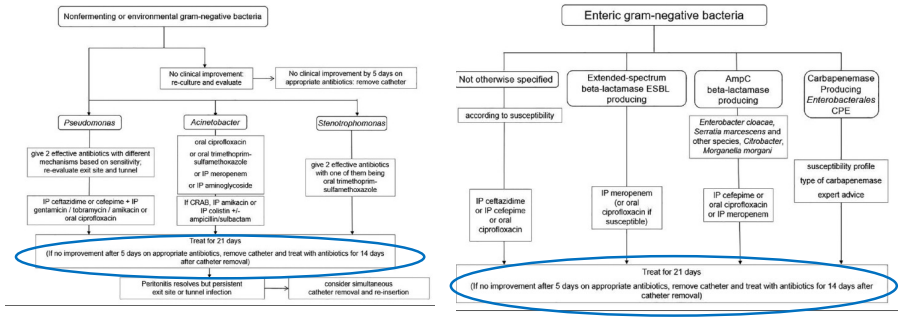
Péritonite en dialyse péritonéale



Peritoneal Dialysis International 2022, Vol. 42(2) 110–153

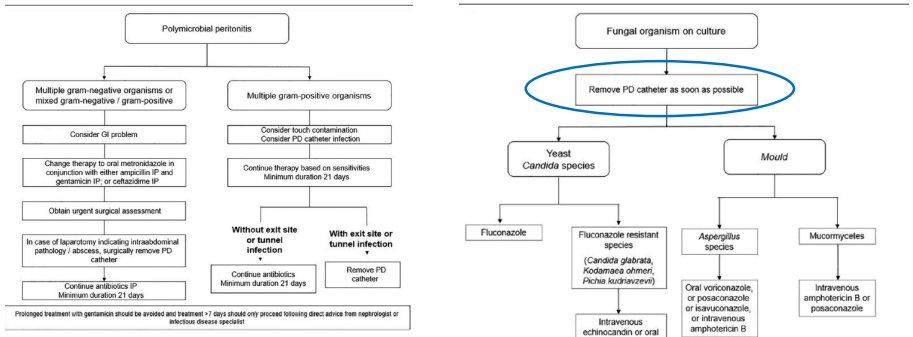
44

Péritonite en dialyse péritonéale



Peritoneal Dialysis International 2022, Vol. 42(2) 110–153

45



Peritoneal Dialysis International 2022, Vol. 42(2) 110–153

46

Reduced Risk of Sepsis and Related Mortality in Chronic Kidney Disease Patients on Xanthine Oxidase Inhibitors: A National Cohort Study (Taiwan)

12,786 stage 5 CKD patients en prédialyse
febuxostat associé à un risque réduit de sepsis ou d'infection : (HR), 0.93; 95% confidence interval (CI), 0.87–0.99; *P* = 0.0324. idem allopurinol HR 0.92; 95% CI, 0.86–0.99; *P* = 0.0163].
Baisse de mortalité par sepsis/infection avec le febuxostat (HR, 0.68; 95% CI, 0.52–0.87) surtout si moins de 65 ans
Moins de mortalité globale
Pas de difference pour MACE

Frontiers in Medicine , 2022

47

QCM

1) Les infections sont la première cause de décès clairement identifié en 2020

2) La mesure de la procalcitonine n'a pas d'intérêt car elle s'élève toujours en cas d'IRC

3) La mortalité de cause cardiaque est fréquente au cours des pneumonies du dialysé

4) L'incidence de bactériémie sur cathéter tunnelisé est plus de 10 fois supérieure à celle observée sur FAV

5) La gentamicine est recommandée en première intention dans les endocardites à SA sur valve native

6) Le traitement empirique d'une péritonite en dialyse péritonéale se focalise sur les cocci G+

48